GUIDELINES FOR PRACTICAL CLASSES

Subject: Information and communication technology
Subjectcode: ICT 1105
Name of EP:
6B10115 Medicine
6B10106 Pharmacy
6B10116 Pediatrics
6B10117 Stomatology
6B07201 Technology of pharmaceutical production
6B10118 Medical and preventive care
Number of academic hours/credits: 150/5
Year: 1,2
Term: 1,2
Number of hours for practical classes: 50

Shymkent 2024

The guidelines for practical classes was developed in accordance with the working curriculum (syllabus) of the discipline ICT and was discussed at the meeting of the department.

Departmental discussion held on №11 от «30» 05 2024.

Head of department ass.professor. Ph.D.,_____Ivanova M.B

Class 1

1. The theme: Calculation of metrics of productivity of computer system: speed, efficiency, energy costs, Amdahl's law, CPU time.
2. The goal: developing students' practical skills in determining the performance of a computer system and increasing it.
3. The learning outcomes: after studying this class, the student will:
- understand what computer system performance is;
- know what factors impact the performance of a computer system;
- determine the performance of computer systems using various tools;
- be able to improve system performance by optimizing the operating system (OS).

4. Main questions of the topic:
1. The performance of a computer system.
2. Tools to determine the performance of a computer system.
3. Ways to improve the performance of a computer system.

Theory

In computer organization, *performance* refers to the speed and efficiency at which a computer system can execute tasks and process data. A high-performing computer system is one that can perform tasks quickly and efficiently, while minimizing the amount of time and resources required to complete these tasks.

There are several factors that can impact the performance of a computer system, including:

1. *Processor speed.* The speed of the processor, measured in GHz (gigahertz), determines how quickly the computer can execute instructions and process data.
2. *Memory*. The amount and speed of the memory, including RAM (random access memory) and cache memory, can impact how quickly data can be accessed and processed by the computer.
3. *Storage*. The speed and capacity of the storage devices, including hard drives and solid-state drives (SSDs), can impact the speed at which data can be stored and retrieved.
4. *I/O devices*. The speed and efficiency of input/output devices, such as keyboards, mice, and displays, can impact the overall performance of the system.
5. *Software optimization*. The efficiency of the software running on the system, including operating systems and applications, can impact how quickly tasks can be completed.

Improving the performance of a computer system typically involves optimizing one or more of these factors to reduce the time and resources required to complete tasks.

Computer performance is the amount of work accomplished by a computer system. The word performance in computer performance means "How well is the computer doing the work it is supposed to do?". It basically depends on response time, throughput and execution time of a computer system.

Response time is the time from start to completion of a task.

Throughput is the total amount of work done in a given time.

CPU execution time is the total time a CPU spends computing on a given task [4].

One method to achieve high performance is *parallelism*. Parallelism is the simultaneous execution of multiple computations

In other words, this method involves dividing a task into smaller subtasks that can be completed simultaneously. For example, a computer can use multiple cores or processors to work on a single task simultaneously, resulting in faster completion of the task. But not all of the process can be parallelized.

Amdahl's law is often used in parallel computing to predict the theoretical *speedup* when using multiple processors.

Amdahl's law can be formulated in the following way.

Let it be necessary to solve some computational problem. Let's assume that its algorithm is such that the share of the total amount of calculations α *can be obtained only by sequential calculations,*

*and the share **1-α** can be parallelized between **p** processors*. Then the *speedup* that can be obtained on a computer system of ***p*** processors, compared to a single-processor solution, will not exceed

$$S_p = \frac{1}{\alpha + \frac{1-\alpha}{p}}$$

Table 1.

α / p	**10**	**100**	**1000**
0	10	100	1000
10%	5,263	9,174	9,910
25%	3,077	3,883	3,988
40%	2,174	2,463	2,496

Table 1 shows data on the speedup of program execution with the share of sequential calculations ***α*** when using ***p*** processors.

For example, if the share of sequential calculations in the algorithm is 25%, then increasing the number of processors to 10 gives a speedup of 3.077 times, and increasing the number of processors to 1000 gives a speedup of 3.988 times.

The performance of a computer system can be measured using various tools. Some of them are provided by the operating system (Windows), while others require installation or downloading.

1. Task Manager

The Windows Task Manager is a powerful tool packed with useful information, from your system's overall resource usage to detailed statistics about each process.

4 ways to open Task Manager in Windows 10:

- press CTRL+SHIFT+ESC;
- press CTRL+ALT+DELETE and select the 'Task Manager' option;
- press Win+X to open the Power Task Menu and select the 'Task Manager' option;
- left-click the taskbar and select 'Task Manager'.

In the Task Manager window, click the *Performance* tab (Figure 1). The *Performance* tab shows real-time graphs displaying the usage of system resources like CPU, memory, disk, network, and GPU. If system has multiple disks, network devices, or GPUs, you can see them all separately. The graphs show resource usage over the last 60 seconds.

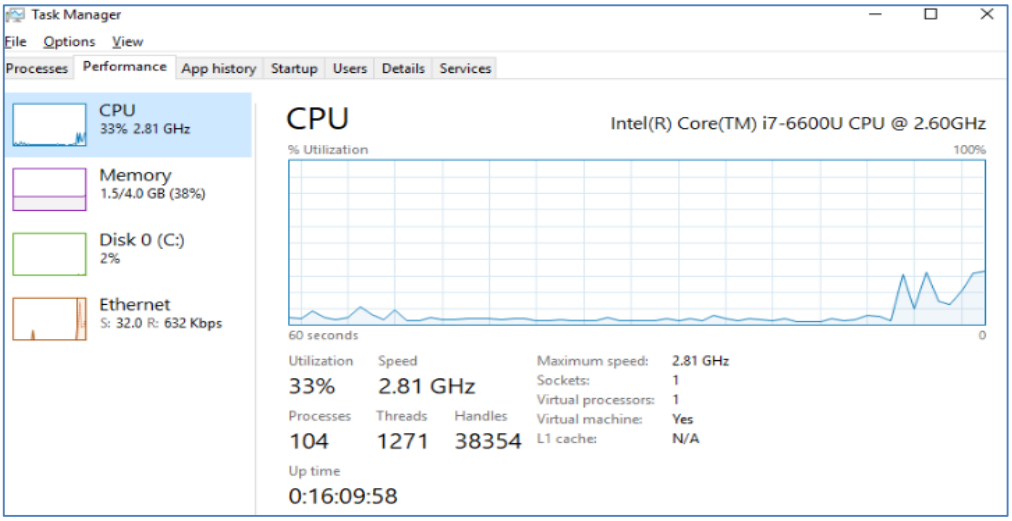


Figure 1. Task manager, Performance tab

2. *Windows Experience Index*

The Windows Experience Index is a rating system that measures the various parts of your computer that affect performance; they include the processor, RAM, graphics capabilities, and hard drive.

To view a computers Windows Experience Index score in **Windows 7** open *the Control Panel > System and Security > System.* Here you can see the *Windows Experience Index* and detailed information about each part.

In **OS Windows 8 and 10** you can get The Windows Experience Index using a PowerShell command. Type *PowerShell* in the Windows search bar. Then right-click on Windows PowerShell and select *Run as administrator* (Figure 2). In the PowerShell window type the command **winsat formal,** then press Enter (Figure 3). The process takes a few minutes. To view the result, input the following command **Get-CimInstance Win32_WinSAT** in PowerShell window and then press Enter. The base Windows Experience Index is listed alongside *WinSPRLevel* (Figure 4).

The base score is equal to the lowest of the subscores and it is not an average of the subscores. The Windows Experience Index scores have different ranges: they range from 1.0 to 7.9 for Windows 7, and from 1.0 to 9.9 for Windows 8/10.

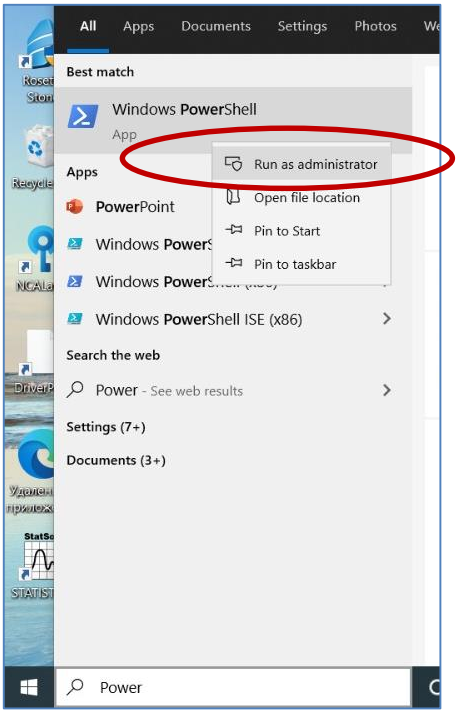


Figure 2. Running PowerShell as administrator

Figure 3. The system performance assessing in PowerShell

```
PS C:\WINDOWS\system32> Get-CimInstance Win32_WinSAT


CPUScore              : 8.6
D3DScore              : 9.9
DiskScore             : 7.65
GraphicsScore         : 5.1
MemoryScore           : 8.6
TimeTaken             : MostRecentAssessment
WinSATAssessmentState : 1
WinSPRLevel           : 5.1
PSComputerName        :
```

Figure 4. The system performance assessing result in PowerShell command

3. Windows Resource Monitor

Windows Resource Monitor is a program in-built into Windows that gives more details about the way Windows manages the resources (memory, processor, disk, network) of computer system (Figure 5). The information is given in real time. To run the Resource Monitor type *Resource Monitor* in the Windows search bar.

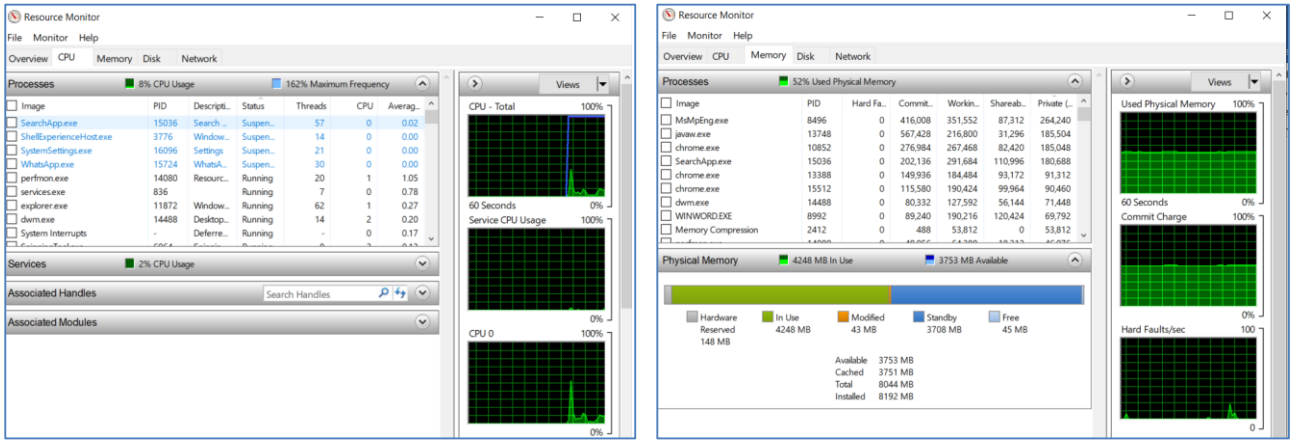


Figure 5. The CPU and Memory tabs of the Resource Monitor program in Windows 10

4. Performance Utilities

To measure the performance of the CPU, special utilities (programs) are used, such as CPU-Z (Figure 6) and Intel Extreme Tuning Utility.

CPU-Z is a freeware system monitoring application for Microsoft Windows that detects the CPU, RAM, motherboard chip-set, and other hardware features of a computer system. The information is given in real time.

5. Benchmarks

Benchmarks are special programs designed to test computer performance. They can measure the performance of the CPU, graphics, hard drive and other components. Some popular benchmarks for Windows 10 are 3DMark, Geekbench and CrystalDiskMark.

Ways to improve Windows 10 performance.

1. Change power plan

Microsoft offers three power plans with Windows 10 systems: Power saver mode, High performance mode, Balanced power mode.

High performance mode maximizes the computer's performance at the cost of energy use.

Start > Control Panel > System and Security (or Hardware and Sound) > Power Options. Click *Create a power plan* and select *High performance* (Figure 7).

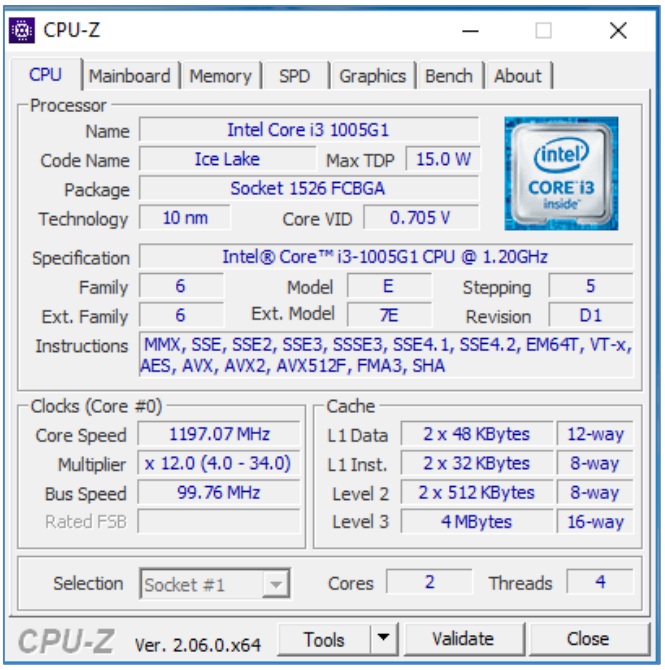


Figure 6. CPU-Z program window

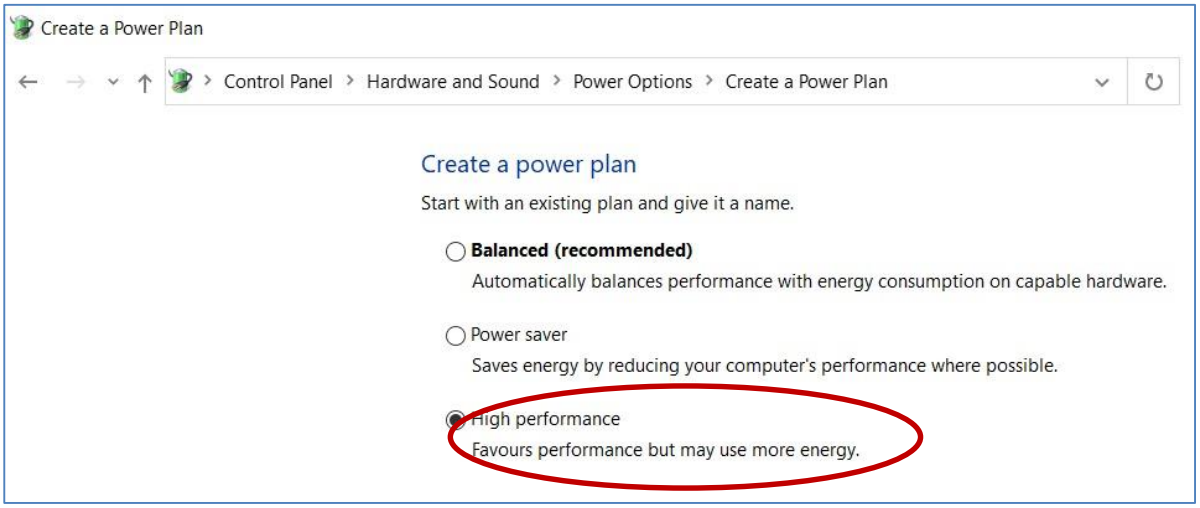


Figure 7. Chang power plan settings in Windows 10

2. Free up disk space. Removing unnecessary folders and files.
3. Disable visual effects in the user interface (UI).

Desktop animations and shadows in the background make the UI look great, but they can consume significant CPU and memory. To turn off these features, *Start* > *Control Panel* > *System and Security* > *System* > *Advanced system settings* > *Advanced* tab > *Settings* > *Adjust for best performance* (Figure 8).

1. Disable startup programs

To manage Windows 10 startup programs, open the *Task Manager* press Ctrl + Shift + Esc and click the *Start-up* tab. Select the programs you don't want to launch automatically and click *Disable* (Figure 9).

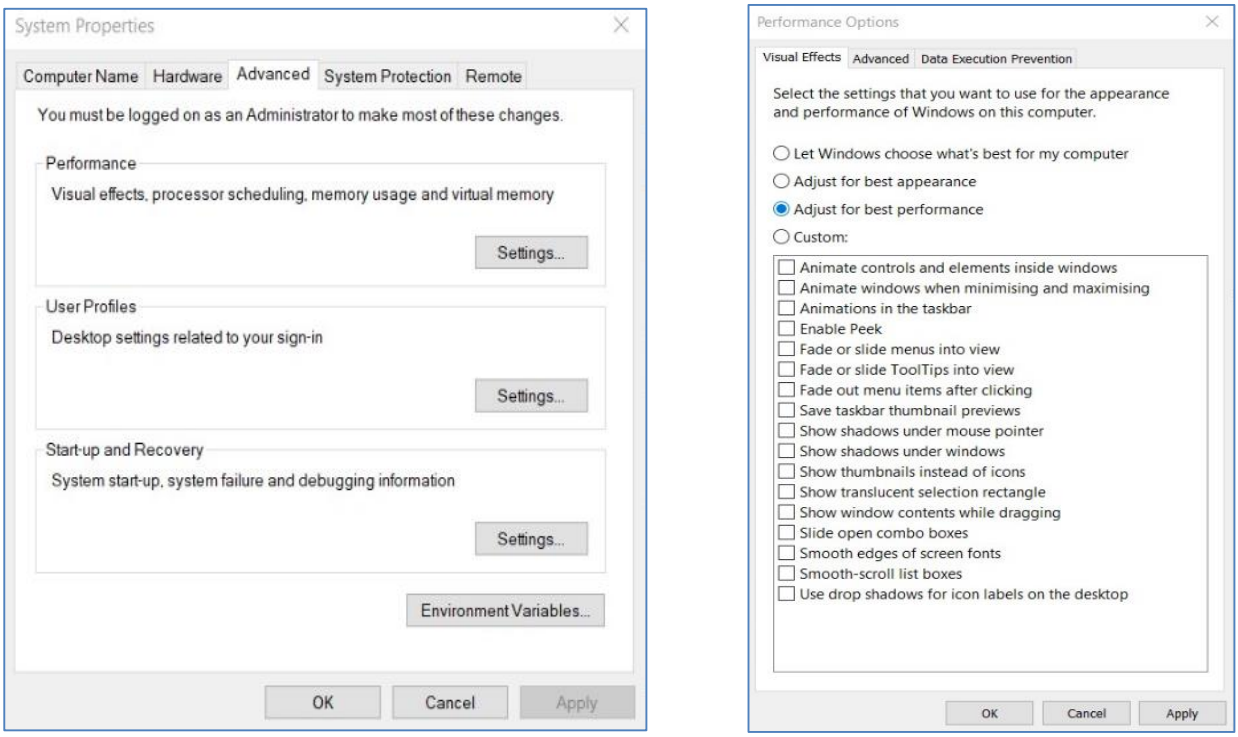


Figure 8. Disable visual effects in Windows 10

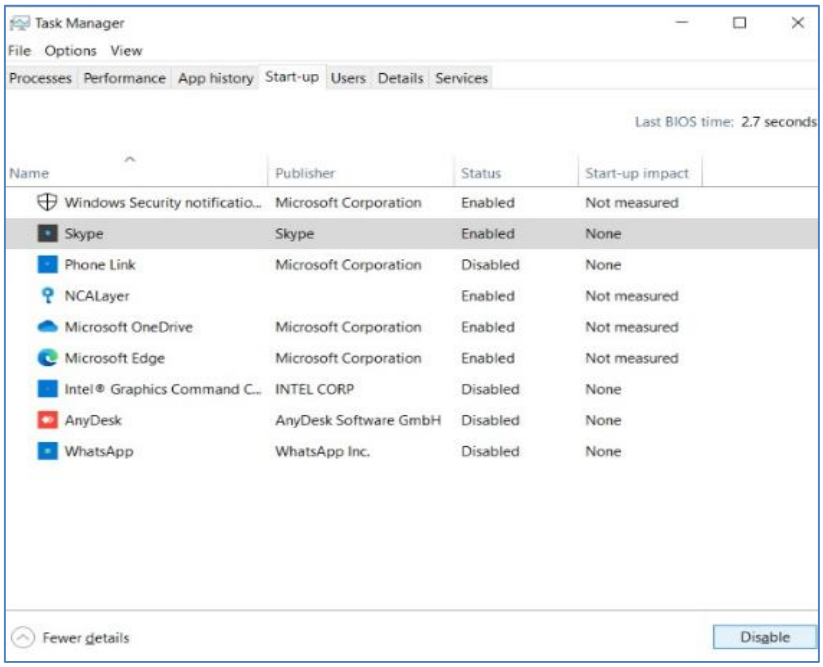


Figure 9. Disable startup programs in Windows 10

Tasks

Task 1.

Using Amdahl's law, determine the speedup of the computer system if:

a) the share of sequential calculations in the algorithm is 5%, and the number of processors is 10;

b) the share of sequential calculations in the algorithm is 30%, and the number of processors is 100;

Task 2.

a) Evaluate the performance of computer system using the tools of Windows OS (7, 8, 10, etc.)

- *Task Manager;*

- *Windows Experience Index;*
- *Windows Resource Monitor;*

b) Formulate recommendations for improving performance of a computer system.

Task 3.

Download and install the CPU-Z program [5] on your computer and determine the technical characteristics of:

- CPU (model name, process technology, structure and size of cache memory);
- motherboard (manufacturer, model name, chipset);
- RAM (type, volume, frequency, connection mode).

Task 4.

Improve the performance of your computer system by optimizing the OS:

- change power plan;
- disable visual effects;
- disable unnecessary startup programs.

Task 5.

Answer the control questions.

2. Teaching methods/technology:

Teaching methods:

- by external signs of the activity of the teacher and students: *story, demonstration, instruction;*
- by source of knowledge: *visual* (use of technical means - computer, projector), *practical* (performing practical tasks);
- according to the degree of activity of students' cognitive activity*: problem-based, partially search, illustrative, explanatory*.

Teaching technology:

- computer training.

6. Assessment methods/technology:

Individual student report made in MS Word in electronic format.

Report Contents

1. Results of solving task 1 (using the MS Word Formula Editor tool to design formulas and calculations) [6].
2. Results of completed work (screenshots), description of actions and conclusions for task 2.
3. Results of analysis of computer technical characteristics using the CPU-Z program (+ screenshots).
4. Results of improving the performance of a computer system by optimizing the OS (screenshots).
5. Answers to control questions.

Teaching assessment checklist:

7. References

1. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
2. Нурпеисова Т.Б., Кайдаш И.Н. ИКТ. Учебное пособие / Алматы, изд-во Бастау, 2017, 183с.
3. Nurpeisova T.B., Kaidash I.N. ICT, Almaty, Bastau, 2017. 241 p.
4. https://www.geeksforgeeks.org/computer-organization-performance-of-computer/
5. https://www.softportal.com/software-1504-cpu-z.html
6. https://www.geeksforgeeks.org/how-to-insert-equations-in-a-ms-word-document/

8. Control questions:

1. What tools can be used to determine the performance of a computer system?
2. What is the Windows Experience Index and how is it measured?
3. What parameters of computer elements affect the productivity index?
3. What is the purpose of the Windows Resource Monitor application?
4. What are "benchmarks"? Give examples.

5. What is the purpose of the CPU-Z program?
6. What hardware characteristics does the CPU-Z program determine?
7. How to improve the performance of a computer system?

Class 2

1. The theme: Determination of properties of an operating system. Operation with files and directories
2. The goal: developing students' practical skills in determining the properties of the OS and changing some of its settings, as well as using the capabilities of the graphical interface and command prompt when working with folders and files in Windows OS.
3. The learning outcomes: after studying this class, the student will:
- know the functions and types of OS;
- be able to determine the properties of the Windows 10 OS and change some of its settings (language, region, desktop appearance);
- configure the appearance and properties of folders in Windows 10;
- be able to perform operations with folders and files using the Windows command prompt;
- be able to perform operations with folders and files in Windows 10.

4. Main questions of the topic:
1. Types of operating systems.
2. Types of user interfaces.
3. Determining the properties of the Windows 10 OS.
4. Change some OS settings.
5. Customizing the appearance and properties of folders in Windows 10.
6. Using the Windows command prompt to work with files and folders.
7. Working with files and folders in Windows 10.

Theory

An *operating system* (OS) is a set of programs which ensures the interoperability of the hardware and software in your computer.

Some of the functions of Operating system are:
- manages computer hardware and software resources;
- provides an interface between user and computer hardware;
- enables communication between user and computer;
- performs memory management;
- manages processes;
- handles file management;
- provides security and access control;
- Enables device and driver management.

Types of Operating Systems

1. Single-user, single-task OS – This kind of OS only permits one person to use the computer at a time for one job.

2. Single-user, multi-task OS – This kind of OS is used on desktop and laptop computers, which allow one user to run multiple programmes simultaneously. Examples of single-user multitask operating systems are Windows and Apple MacOS.

3. Multi-user OS **–** A multi-user OS enables multiple users to work on the same computer at different times or simultaneously.

*4. Real Time OS***–** A computing environment that responds to input within a specific period of time is known as a real-time operating system. It controls the computer's resources so that each operation is completed in exactly the same amount of time each time. Real-time operating systems include Lynx OS and Windows CE.

A *user interface* (UI) refers to the part of an operating system, program, or device that allows a user to enter and receive information.

A *text-based user interface* (Figure 1) displays text, and its commands are usually typed on a command line using a keyboard.

With a *graphical user interface* (Figure 2), the functions are carried out by clicking or moving buttons, icons and menus by means of a pointing device (mouse).

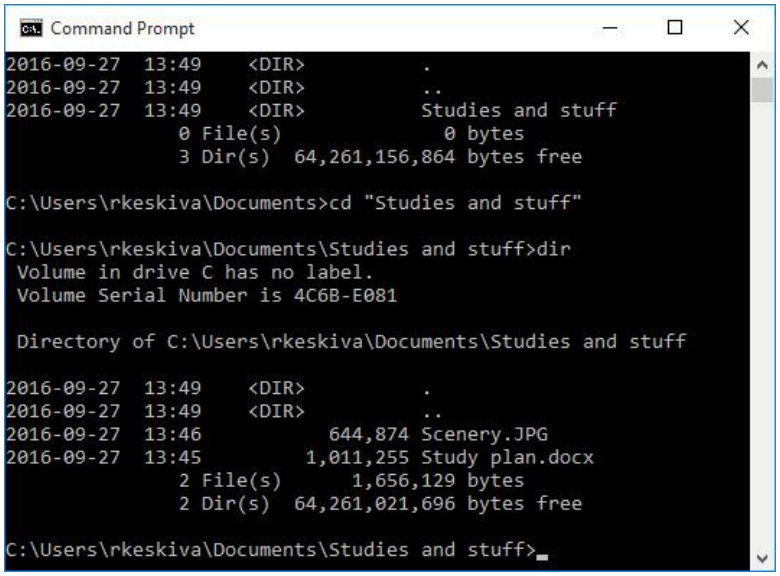


Figure 1. Text-based user interface

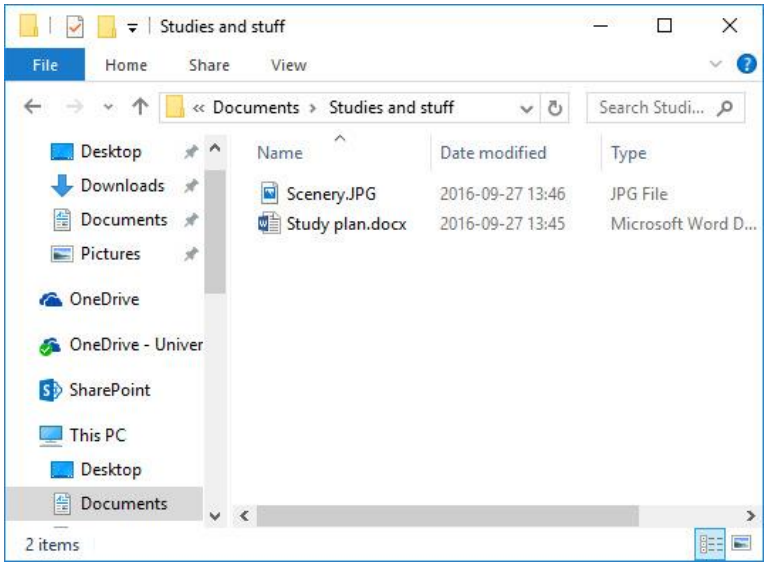
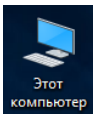


Figure 2. Graphical user interface

Viewing OS properties can be done in one of the following ways:

1. *This PC* icon.

Find the icon 

on the desktop and right-click on it > Properties (Fig. 3).

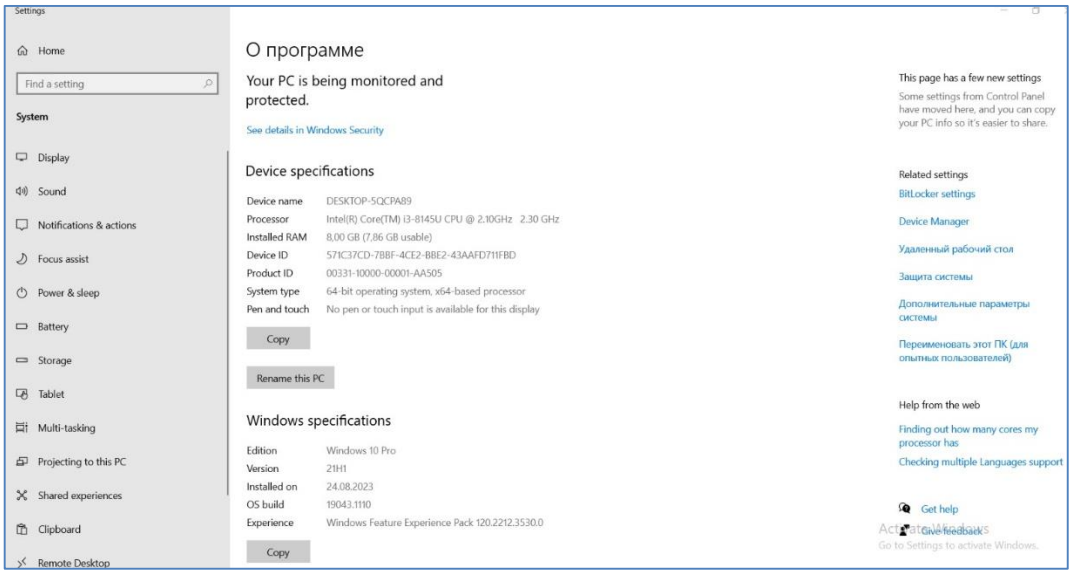


Figure 3. Viewing OS properties

2. *Settings* app.

Start > *Settings*  > *System* > *About System.*

3. *Control panel* component.

Ways to open Control Panel Windows:

- click *Start*, type *control panel*, and select the top result *Control Panel* app from the list to open it;
- press Win + R keys on the keyboard to open Windows Run dialog, and type *control* in Run, click OK to open *Control Panel* (Figure 4).

To view OS properties, in the *Control Panel* window, select *System and Security* > *System.*

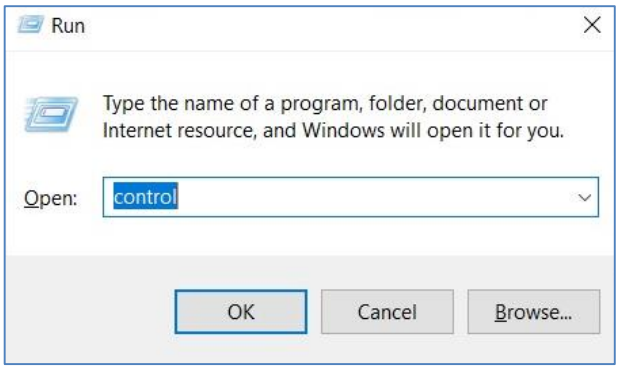


Figure 4. Launching *Control Panel*

Managing the Windows 10 OS's settings.

Most of the settings on a computer are managed via the operating system's *Control panel*, which contains the following sections (Figure 5):

- System and security;
- Network and Internet;
- Hardware and Sound;
- Programs;
- User Accounts;
- Appearance and Personalization;
- Clock and Region;

- Ease of Access.

Figure 5. Control panel

Let's look at changing some settings of Windows 10.

1. Changing the Windows 10 OS language.

Start > Settings  *> Time and language > Language > Windows display language > Russian (Kazakh, English)* (Figure. 6).

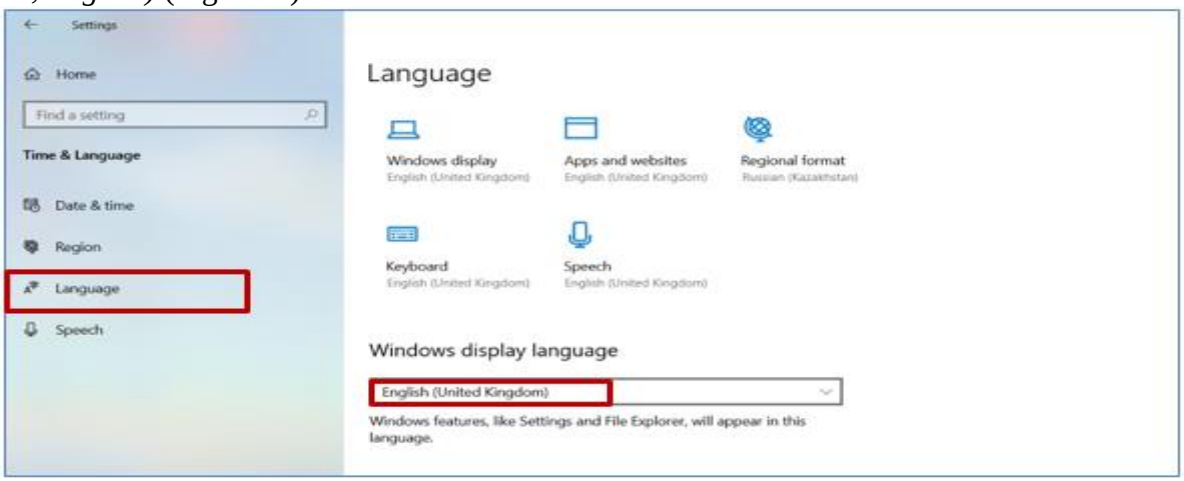


Figure 6. Changing the Windows 10 OS language

2. Changing the region in Windows 10 OS.

Start > Settings  *> Time and language > Region > Regional format> Russian (Kazakh, English)* (Figure. 7).

3. Personalization Settings in Windows 10.

Personalization is customizing the design of the operating system to suit your individual (personal) tastes and needs. The user can personalize the Windows 10 desktop, theme, window colors, lock screen, sounds, font size and more on his computer according to his preferences.

Ways to open Personalization Settings in Windows 10:

- right-click on the desktop, select *Personalization*;
- *Start > Settings > Appearance and Personalization.*
- A *theme* is a combination of desktop background pictures, window colors, and sounds.
- Windows computers ship with a theme already in place. Many users opt for the default configuration during installation or setup, and thus, the most common elements are applied automatically, but the user can create and customize a *new theme* as desired.

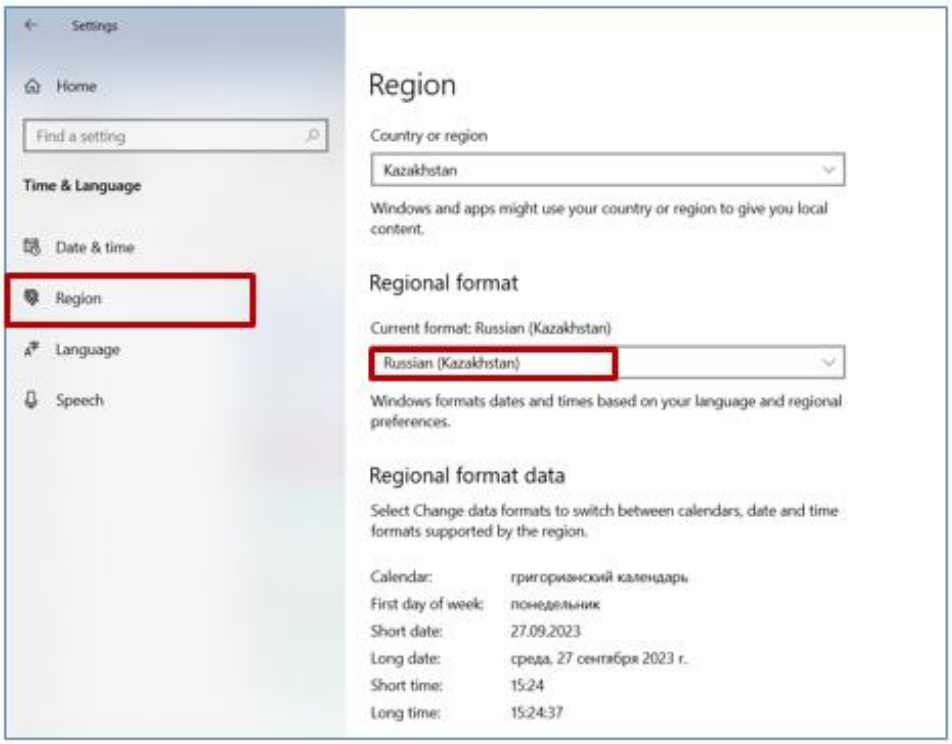


Figure 7. Changing the region in Windows 10

To change the desktop background image, select *Background* > *Browse*, and then select the image you want.

However, if the Windows 10 OS is NOT ACTIVATED, the user will not be able to change the theme or wallpaper on the desktop due to the fact that the personalization settings will be locked (Figure 8).

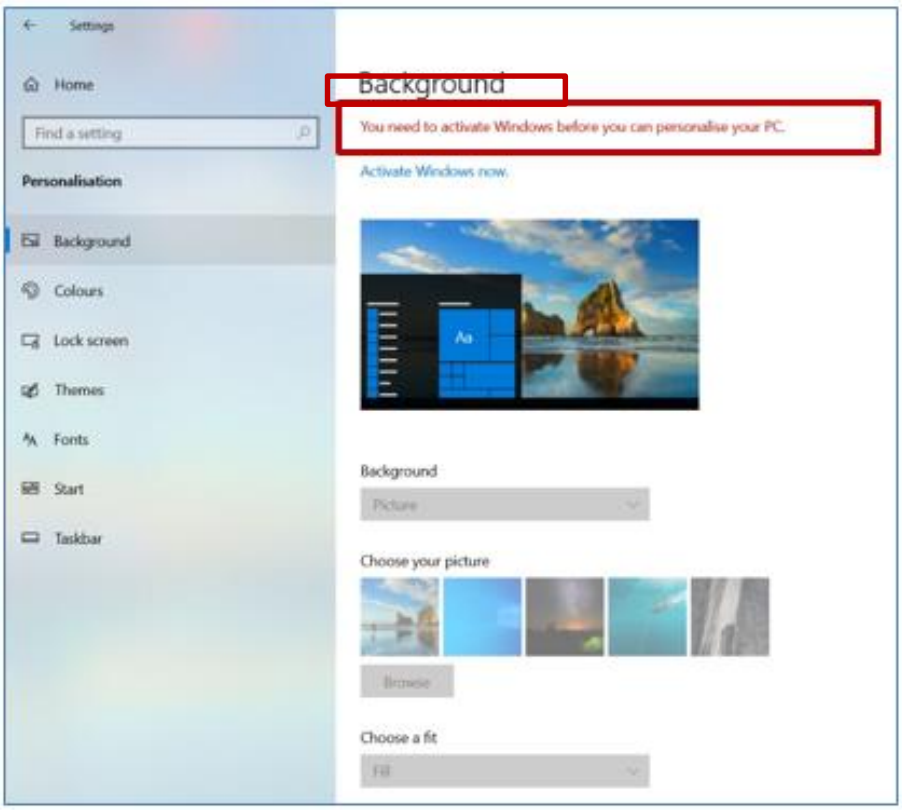


Figure 8. Personalization Settings (Windows 10 OS is not activated)

If the OS is not activated, but the user needs to change the background image, then he needs to do the following:

- right-click on any image on his computer. The image must match the proportions of the screen and have sufficient resolution so that the background image on the screen looks organic;
- select *Set as desktop background* in the context menu.

To change the theme for a non-activated Windows 10 OS, you need to disable the *Prevent changing the theme* using *Group Policy* option.

To disable Prevent changing theme setting using Group Policy, follow these steps:

- download the theme you like – a file with the *.themepack extension from the official Microsoft repository;
- press Win+R to open the Run prompt on your PC;
- type gpedit.msc, and press OK button to open the Local Group Policy Editor (Figure 9);

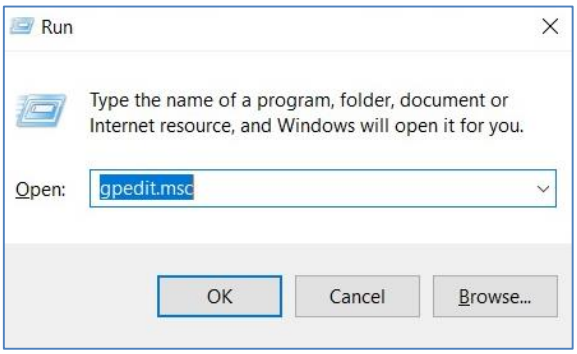


Figure 9. Opening the *Local Group Policy Editor*

- select *Administrative Templates* > *Control Panel* > *Personalization* > double-click the *Prevent theme changes option* (Figure 10). In the window that appears, select the *Disabled* option (Figure 11) > OK;
- find the previously downloaded file with the *.themepack extension and open it. The OS theme will change (Figure 12). The background image of the desktop and the color scheme of the start menu will change. To return to the previous theme, you need to select *Default themes* (Figure 13).

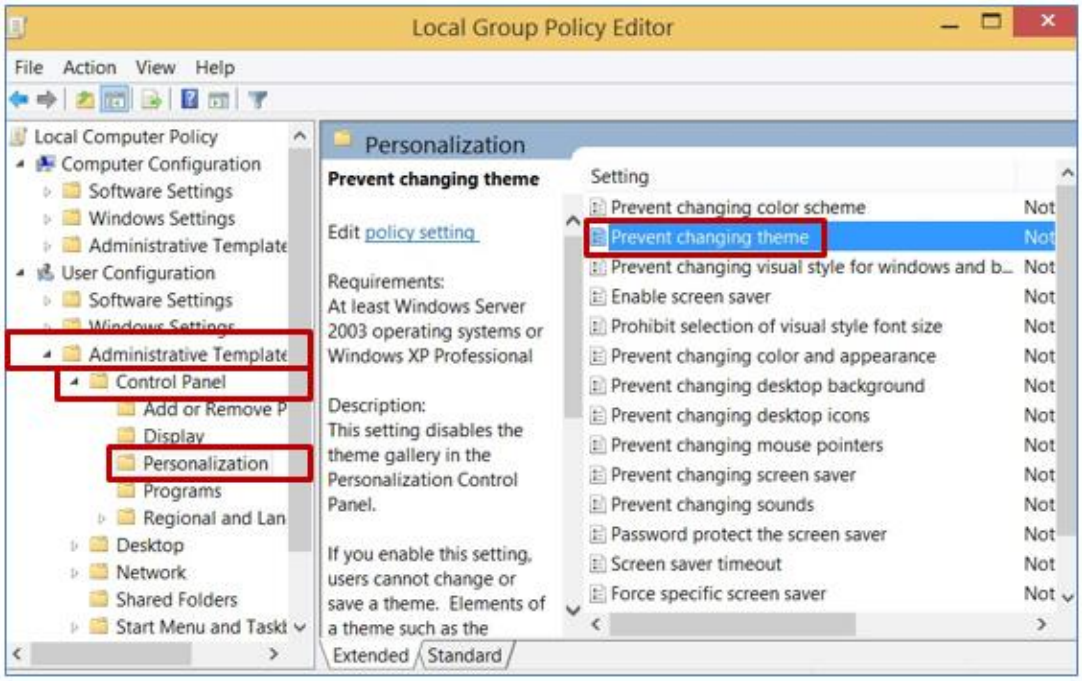


Figure 10. Selecting the *Prevent Changing Theme* option

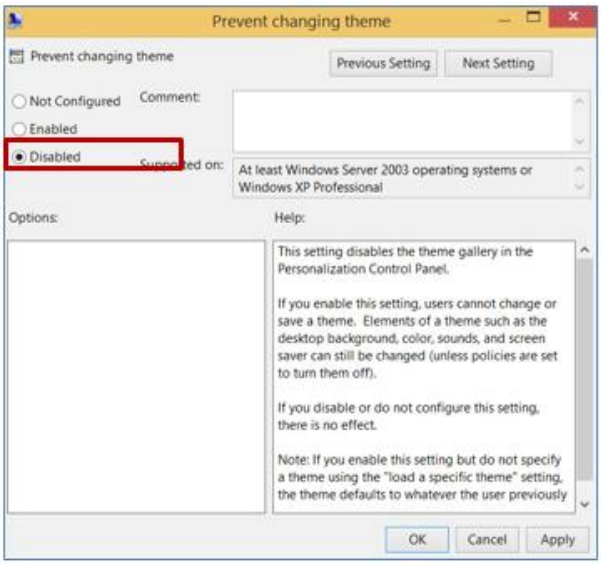


Figure 11. Disable the *Prevent Changing Theme* option

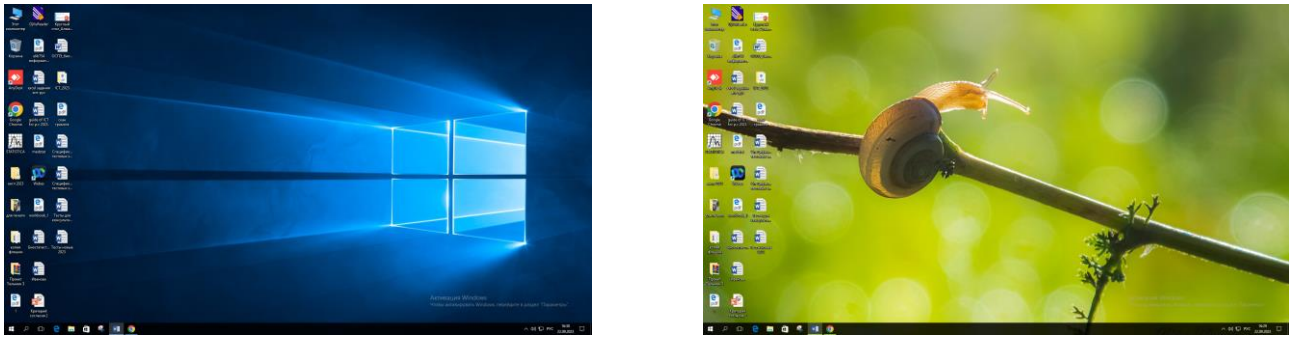


Figure 12. Changing the OS theme

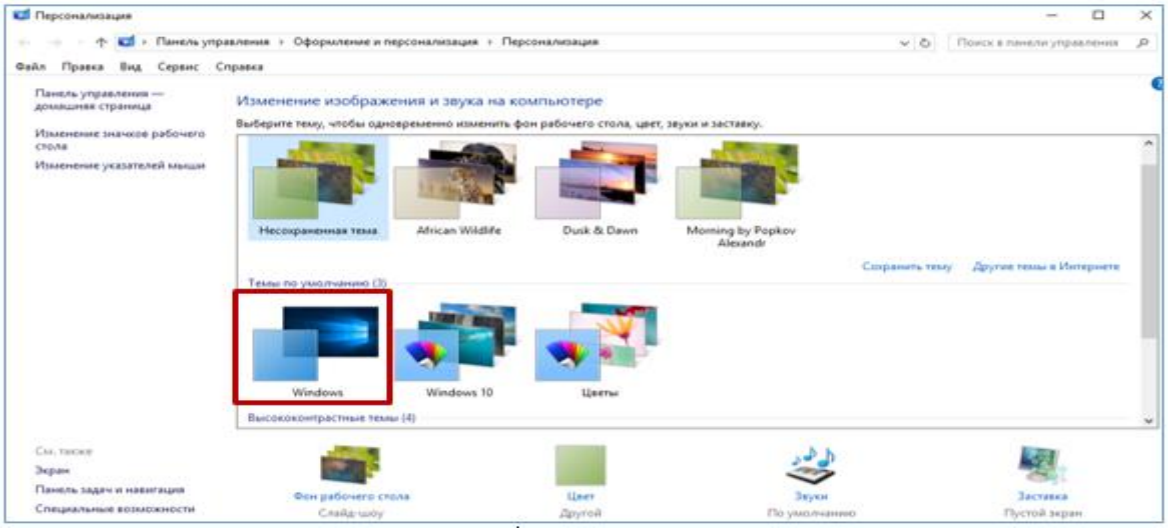


Figure 13. Selecting the default *Windows* theme

4. Customizing the view of desktop icons

Right-click on the desktop > *View* > select the size of the icons and the principle of their arrangement on the desktop (*Auto arrange icons* or *Align icons to grid*) (Figure 14).

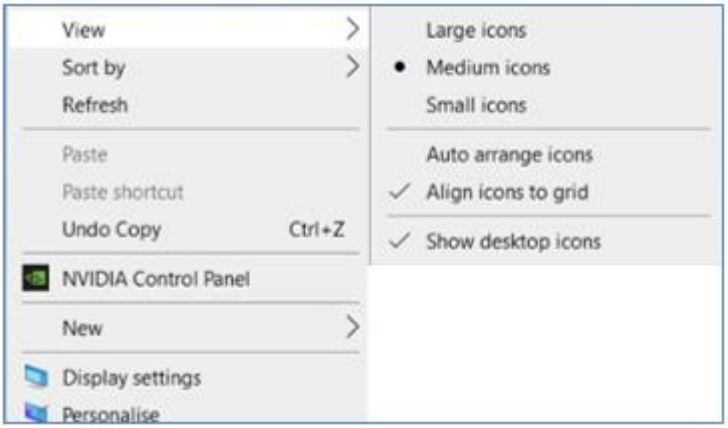


Figure 14. Customizing the view of desktop icons

Some folder settings in Windows 10.

1. Setting up the presentation of the folder (file) structure.

This PC > select any folder in *Explorer* and open it > *View* tab. In the *Layout* group, you can present folders in the form of a list, a table, and increase or decrease the size of the icons (Figure 15).

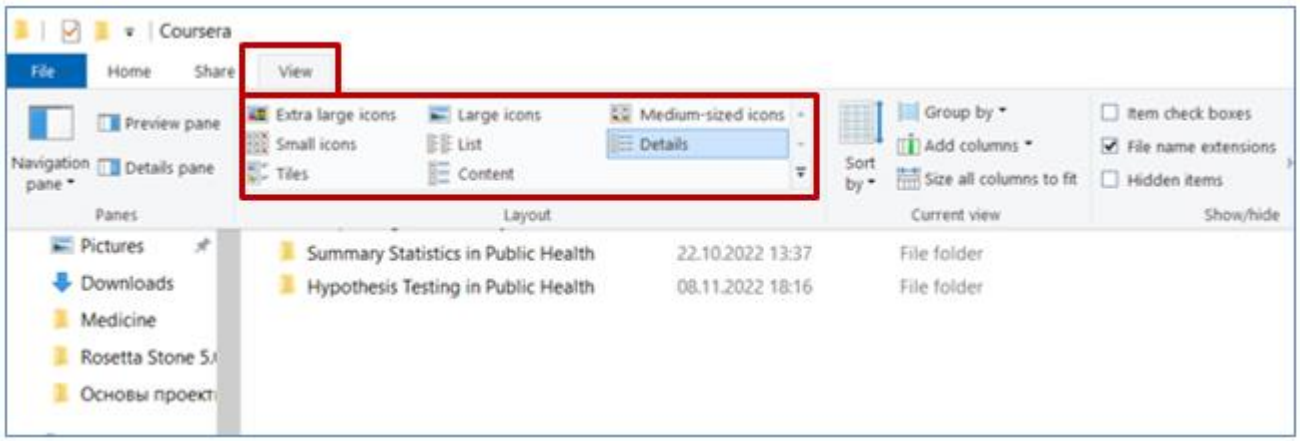


Figure 15. *Setting up the presentation of the folder (file) structure*

2. Grouping or sorting folders (files).

This PC > select any folder in *Explorer* and open it > *View* tab > *Current view* group > *Sort by* (Figure 16).

3. Changing the folder icon on the desktop

Any version of Windows OS has the main desktop icons: *This PC*, *Recycle Bin* and *Control Panel*. To change their appearance do the following:

- in the *Start* menu, select *Settings* (or press Win+I);
- go to *Personalization* section > *Themes* tab > *Desktop icon settings*;
- pick an icon from the list and click *OK*. Or you can click *Browse* to select a custom icon.
- click *Apply* and *OK*.

4. Changing the folder icon

- download the new icon for the folder with the *.ico extension;
- select the folder > right-click on it > *Properties* > *Settings* > *Change icon* (Figure 17) > *Browse* > find the previously downloaded file, select it > *Apply* > *OK*.
- if the icon has not changed, press the F5 key;
- if you don't like the icon, you can *restore the default* values.

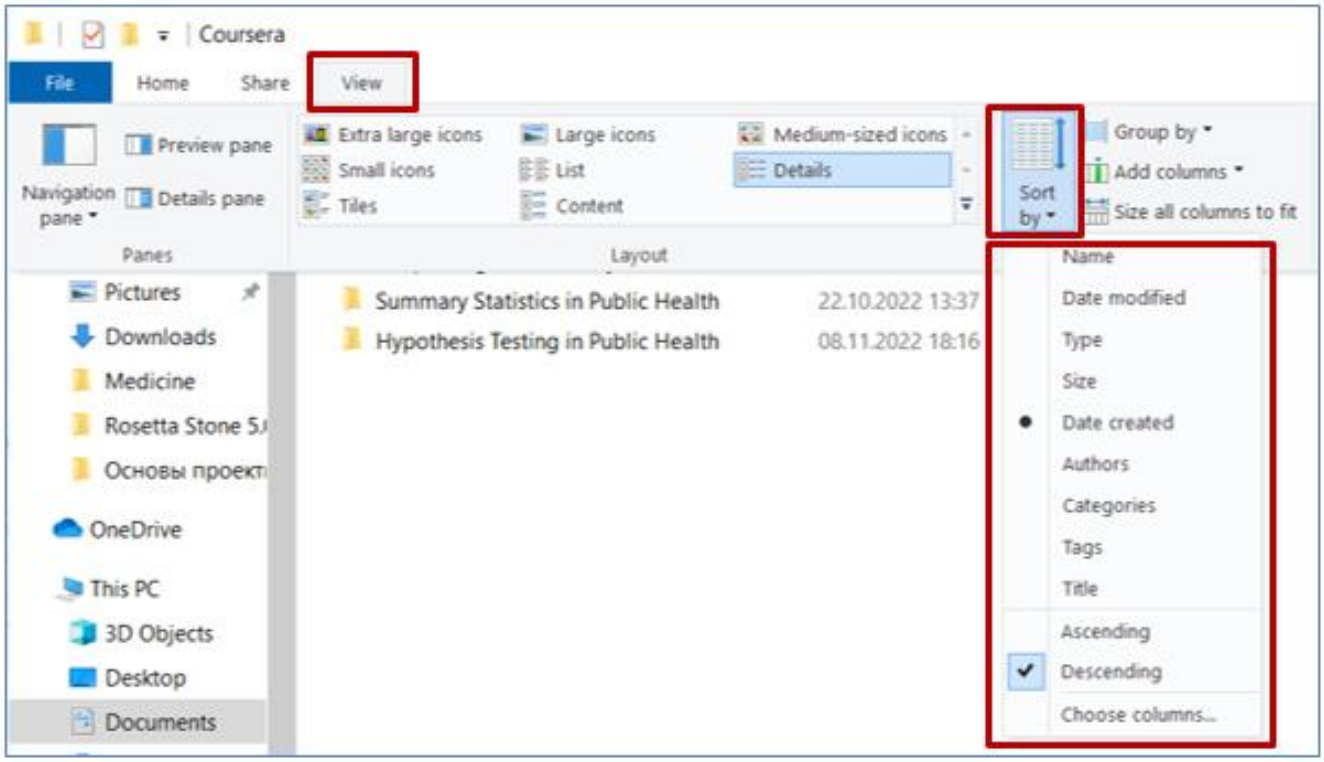


Figure 16. Sorting folders (files)

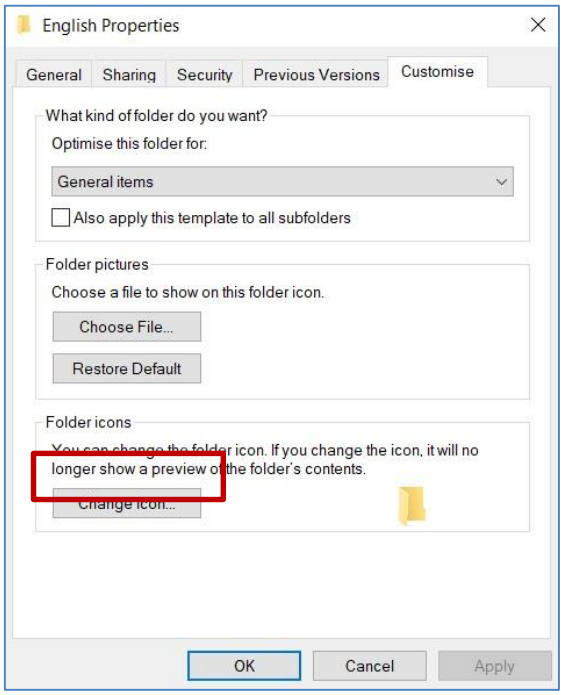


Figure 17. Changing the folder icon

The *Windows command prompt* is one of the most powerful utilities on a personal computer running Windows. The command prompt can be used to execute specific commands and perform advanced functions. If you need to troubleshoot your Windows laptop or computer, you may need to run the command prompt.

You can launch *command prompt* using a variety of easy methods:

- press Win+R keys to open *Run* program. Type the cmd command and press OK (Figure 18);

- right-click on *Start* and select *Command Prompt* from the menu that opens;
- in the search bar on the start screen type cmd. Click *Command Prompt* in the menu that opens;

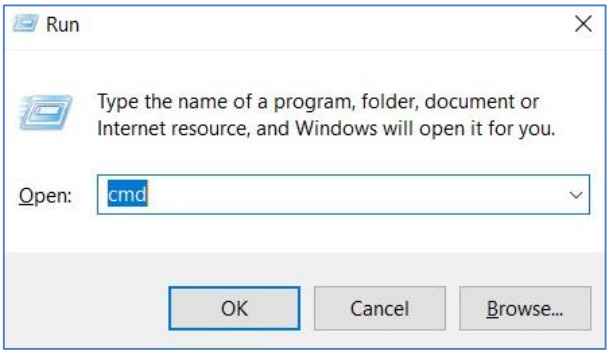


Figure 18. Launching the *Command Prompt*

Commands for files and directories (folders) management in the Command Prompt [5], [6]:

1. **cd -** changes directory (Figure 19);

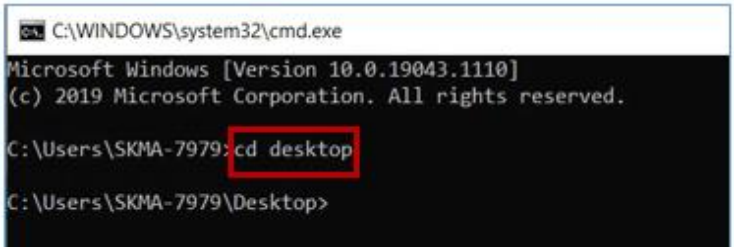


Figure 19. Changing the current *SKMA-7979* directory to the *Desktop* directory

2. **dir -** displays files and folders in current directory. After entering the command, press Enter (Figure 20).

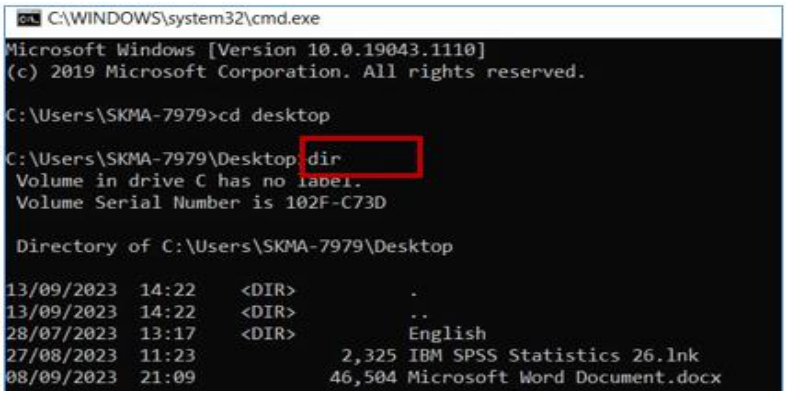


Figure 20. Viewing the contents of the *Desktop* directory

3.**mkdir –** creates a directory. After command type the name of the directory and its path (Figure 21);

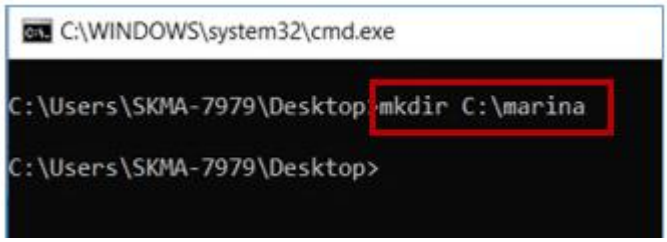


Figure 21. Creating a new directory *marina* on drive *C*

4. **fsutil file createnew *.txt 4000 -** creates a text file, instead of * type the file name, 4000 is the file size in bytes (the size can be changed) (Figure 22);

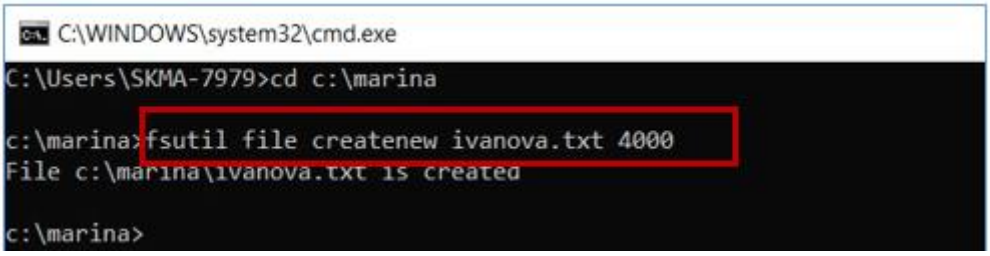


Figure 22. Creating a text file *ivanova* with a *txt* extension of 4 KB in size

5.**copy con *.txt -** creates a text file from the Command Prompt, allowing users to type in the file's content and save it. After command **copy con** type file name with extension txt, press the *Enter* key to enter the file's content. Type the content you want to include in the Command Prompt. To end the input and save the file, press Ctrl + Z, followed by the *Enter* key. The file will be saved in the current directory (Figure 23);

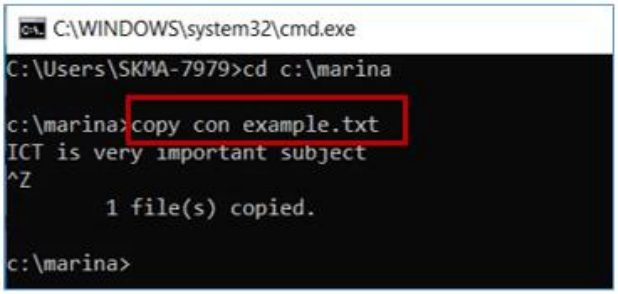


Figure 23. Creating a text file *example.txt* containing the sentence *ICT is really important subject*

6. **del -** deletes files. After command **del** type the file name with extension. To delete all files from the current directory, use the **del *** command (Figure 24). To delete files only with a specific extension, for example, docx, enter **del *.docx**;

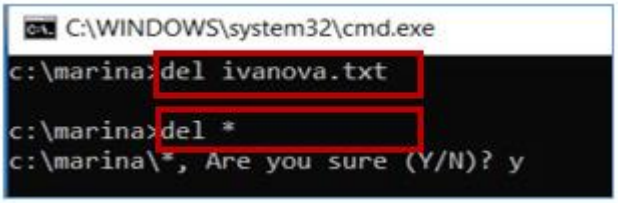


Figure 24. Deleting files from the *marina* directory

7. **rmdir -** deletes a directory. After command type the directory name and it's path (Figure 25). The **rmdir** command is used to delete EMPTY directories on the system;

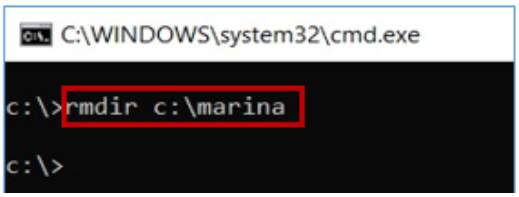


Figure 25. Deleting the *marina* directory

8. **rename –** renames a file or directory. After command type the old file name, then the new one (Figure 26).

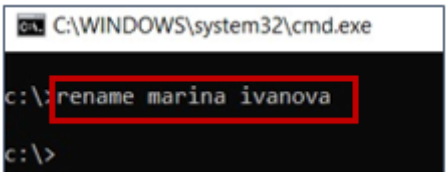


Figure 26. Renaming the *marina* directory to *ivanova*

9. **copy –** copies files. After command type the file old path and then the new one (Figure 27).

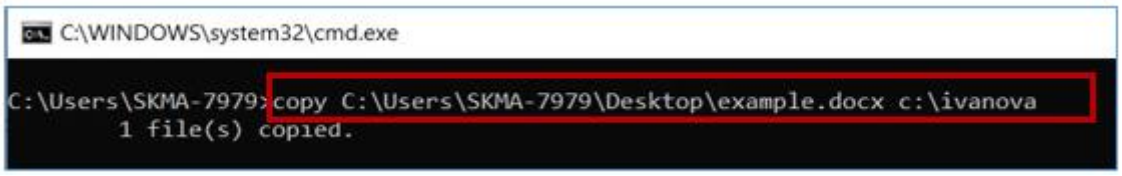


Figure 27. Copying the *example.docx* file from the Desktop to the *ivanova* directory

10. **move –** moves files or directory from one directory to another. After command type the file (directory) name and it's path then it's new path (Figure 28).

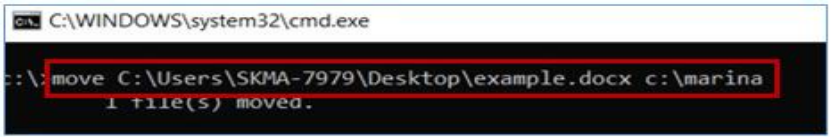


Fig. 28. Moving the *example.docx* file from the Desktop to the *marina* directory located on the disk *c:*

11. **tree** - shows directory structure of a disk or folder (Figure 29).

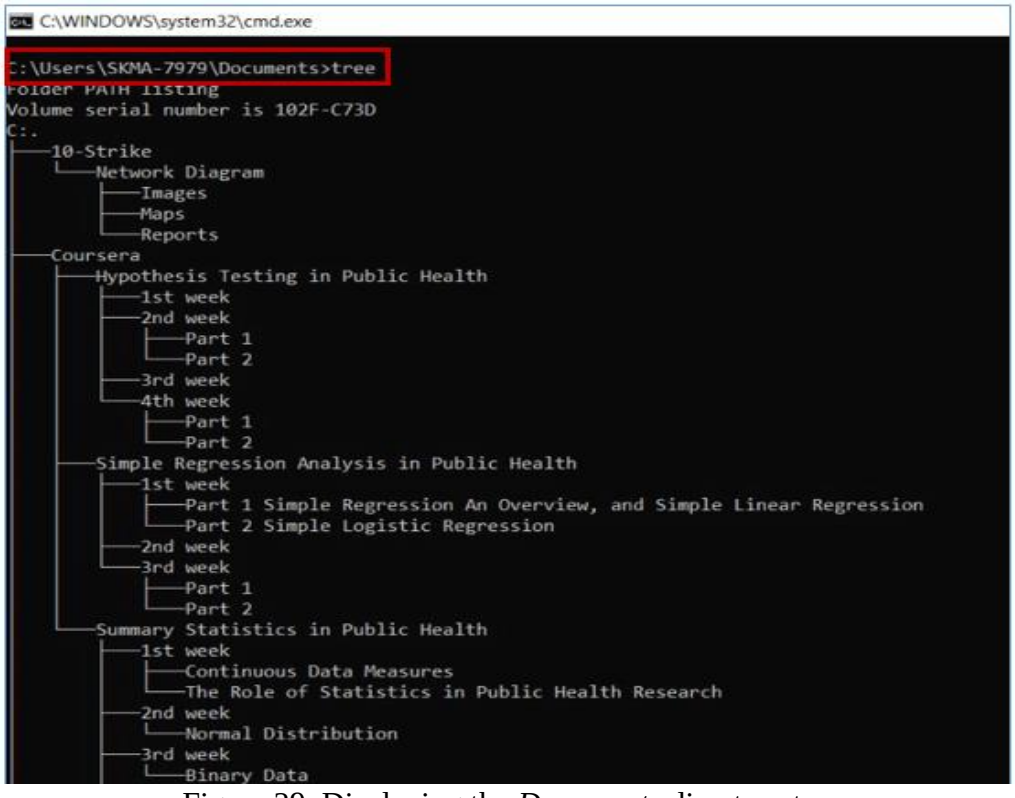


Figure 29. Displaying the *Documents* directory tree

Other useful Commands of *Command prompt*:

1. **ver –** allows you to view the Windows version (Figure 30);

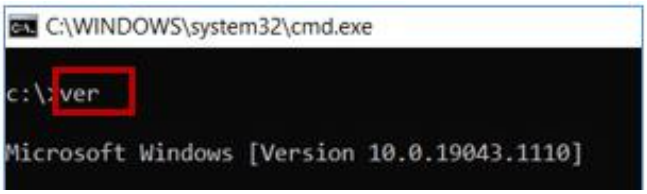


Figure 30. Viewing the OS version

2. **date -** outputs or sets the current date. To change the current date you must have administrator rights (Figure 31);

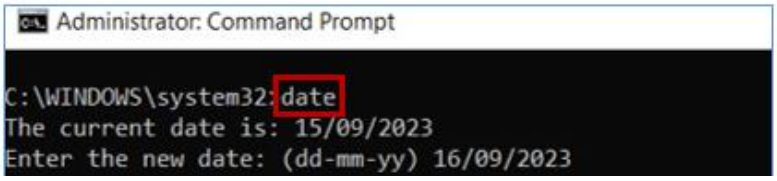


Figure 31. Viewing and changing the current date

3. **time –** displays or sets the system time. To change the current time you must have administrator rights (Figure 32);

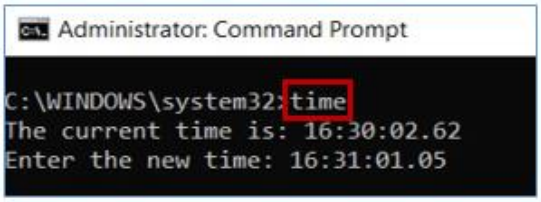


Figure 32. Viewing and changing the current time

4. **start** – opens web-page. After command type the web-page address (Figure 33);

Figure 33. Opening a web-page via the Command prompt

5. **cls -** clears screen;
6. **exit –** exits the Command prompt;
7. **shutdown/r -** restarts the computer.

Tasks

Task 1.

Construct a diagram containing information about OS types. Give examples for each type of OS.

Task 2.

Change some Windows OS settings:

a) View the properties of the OS you are using via:

- *This computer* icon;
- *Settings* App;

- *Control Panel* component;

b) Change the OS language from Russian to Kazakh (or English) and change again to Russian;

c) Change the OS region to *Kazakh (Kazakhstan)*, open *Calendar* and view changes. Change the region to *Hindi (India)*, open *Calendar* to view the changes. RESTORE the region to *Russian (Kazakhstan)*;

d) Download the desktop theme from the official Microsoft repository. Apply it. View changes. RESTORE default Windows theme;

e) Experiment by changing the appearance of desktop icons (*large*, *small*, *medium*) and their location on the desktop (*auto arrange icons, align icons to grid*). RESTORE icon settings – *medium* and *align icons to grid*;

Task 3.

Change some folder settings in Windows 10:

a) Change the *Documents* folder settings:

- view – table;
- sorting - by date created and descending;
- with file name extension.

b) Change the *This PC* icon to another one suggested by the OS, then RESTORE the default icon.

c) Download the icon for the folder in .ico format. Apply it to the *Downloads* folder. RESTORE the default icon.

Task 4.

Working in *Command prompt* mode

1. Change the current directory to drive C.
2. Create a directory with your name and go to it.
3. In the directory with your name, create an ICT subdirectory and go to it.
4. Create two subdirectories in the ICT directory: PRACTICE and SIW.
5. Go to the PRACTICE directory and create subdirectories LESSON1 and LESSON2.
6. Go to the LESSON1 directory and create 2 text files in it: the first with the name DEFINITION, the second with the name TABLE.
7. The DEFINITION file must contain the following information:

Computer is an electronic device that is designed to work with information

8. Rename the DEFINITION file to GLOSSARY.
9. Copy the GLOSSARY file to the SIW directory.
10. Move the TABLE file from the LESSON1 directory to the LESSON2 directory.
11. View the contents of the directory with your name.
12. Display the directory tree with your name.
13. Delete the TABLE file from the LESSON1 directory.
14. Remove all subdirectories from the ICT directory.
15. Rename the ICT directory to EXAMPLE.
16. View OS version.
17. View the current date and time.
18. Using the Command Prompt go to the SKMA website https://skma.edu.kz/.
19. Clear the Command prompt.
20. Restart the computer using the Command prompt.

Task 5.

Answer the control questions

5. Teaching methods/technology:

Teaching methods:

- by external signs of the activity of the teacher and students: *story*, *demonstration, instruction;*
- by source of knowledge: *visual* (use of technical means - computer, projector), *practical* (performing practical tasks);

- according to the degree of activity of students' cognitive activity*: problem-based, partially search, illustrative, explanatory*.

Teaching technology:

- computer training.

6. Assessment methods/technology:

Individual student report made in MS Word in electronic format.

Report Contents

1. Result of task 1 is a diagram constructed using the MS Word SmartArt tool.
2. Results of task 2 - changing some Windows OS settings – screenshots describing user actions with comments.
3. Results of task 3 - changing some folder settings in Windows 10 - screenshots describing user actions with comments.
4. Results of task 3 - working in Command prompt mode - screenshots describing the progress of the task.
5. Answers to control questions.

7. References

1. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
2. Нурпеисова Т.Б., Кайдаш И.Н. ИКТ. Учебное пособие / Алматы, изд-во Бастау, 2017
3. Nurpeisova T.B., Kaidash I.N. ICT, Almaty, Bastau, 2017. 241 p.
4. https://ithelperaddress.com/full-lab-9-commands-for-beginners-learning-the-command-prompt-in-windows/
5. http://pcprintinfo.ru/?p=2624
6. https://medium.com/beyondx/windows-cli-basics-600b0e46fdbe

8. Control questions:

1. What is an operating system? Give examples of OS.
2. What characteristics does Windows 10 have?
3. What functions does the operating system perform?
4. What is the purpose of a file system?
5. What is a file? Give examples of files with different extensions.
6. What is a directory?
7. What is an interface?
8. Which built-in application is used to change most Windows10 OS settings? List several ways to open it.
9. What is *Personalization* in the OS? What changes can be made using the *Personalization* in Windows?
10. List the advantages and disadvantages of the command prompt interface?
11. What command prompt commands are used to work with directories?
12. What command prompt commands are used to work with files?

Class 3

1. **The theme:** Determination of requirements to development "convenient in application" the website. Networks and telecommunications. Creation of a simple network configuration. IP addressing. Monitoring of a network. Analysis of traffic. Use of sniffers for the analysis of network packets
2. **The goal:** The aim of this class is to develop a solid grasp of network by introducing the basic concepts and to provide students with interactive web pages and create a simple website.
1. **The learning objective:** Having studied this class the student will be able to:
   - describe what a computer network is;

- define the basic terminology;
- classify the networks according to the scale;
- describe what LAN, MAN, and WAN are;
- classify the networks according to the topology;
- identify the basic hardware used in networking computers;
- describe what Internet, Intranet, and Extranet.

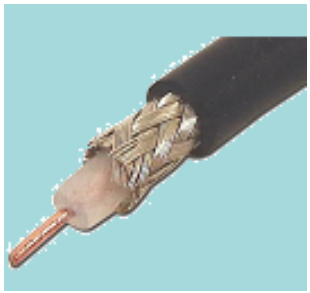
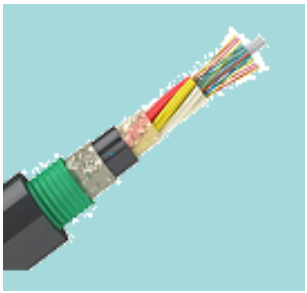
2. Key questions of the theme:

1. Why do we need to connect computers?
2. What is a computer network?
3. What is the use of a modem?
4. What kind of network topologies do you know?
5. What is meant by Internet and Intranet? Why it is important to use Intranet than Internet?
6. What is IP addressing?
7. What is web technology?
8. What is a webpage?
9. What is the Mobirise?
10. Structure of the Mobirise.
11. What is the block for webpage?

Tasks

1. Read the theory.
2. Build a diagram that describes the classification of computer networks (by scale, by transmission medium, by functional relationships, by topology) using the MS Word SmartArt tool. (6-12)
3. Make a glossary for the following terms: (11-22)
   bandwidth, bluetooth, client/server network, ethernet, fiber-optic cable, host computer, intranet, internet, IP address, local area network (LAN), mesh network, network, node, peer to peer, personal area network (PAN), protocol, ring network, star network, topology, twisted-pair wire, virtual private network (VPN), wide area network (WAN), wi-fi.
4. Label the photos with the network hardware in the table below. (3,5-7)



1 _____ 2 _____ 3 _____ 4 _____



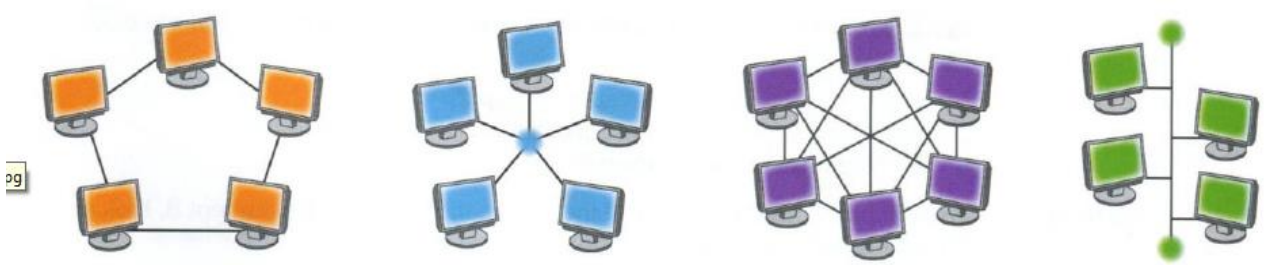
5 _____ 6_____ 7_____

Network Interface Card	Hub
Switch	Coaxial cable
Router	Optical fiber
Twisted-pair wire	

5. Match the words 1-8 to the descriptions a-h. (4-8)

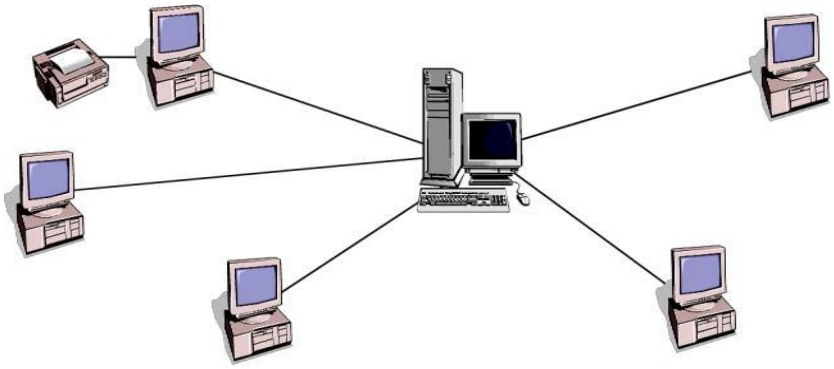
1.	Modem	A	is an entrance to another network
2.	Repeater	B	channels incoming data but maintains the bandwidth speed
3.	Bridge	C	allows wireless devices to connect to the network
4.	Router	D	modulates and demodulates the data into a digital or an analog signal
5.	Gateway	E	channels incoming data but shares the bandwidth among the devices present on a network
6.	Switch	F	sends the digital signal further on in the network
7.	Hub	G	connects networks and sends packages of data between them
8.	Wireless access point	H	connects networks that use the same protocol

6. Name the following different types of network. (1-2)

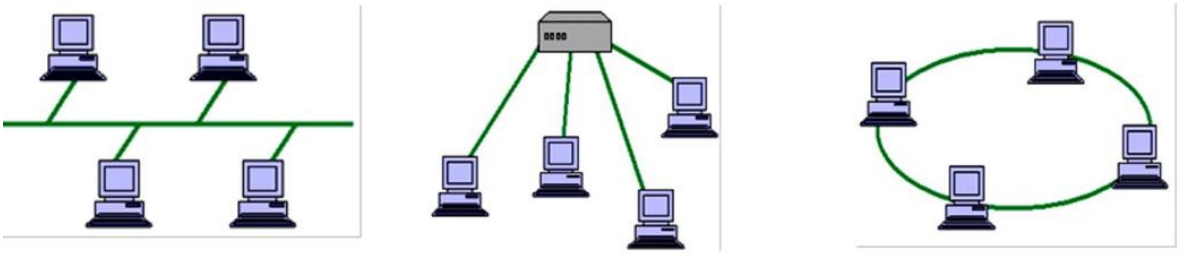


1 _____ 2 _____ 3 _____ 4_____

7. Label the diagram of a network using these terms: *file server, terminals, cables, print server.* (1-2)



8. Complete the table giving below. Show the features of each type of network using these key terms: *expensive, economical, single cable, many cables, reliable, unreliable, links to server, links to other PC's.* (3-6)



A B C

	A	B	C
Cost to set up			
Number of cables			
Links			
Reliability			

Tasks:

1. 1. Practical exercises: using the Mobirise program, create and arrange a site on the following topics:
2. a) advertising site of the South Kazakhstan Medical Academy
3. b) advertising site of your faculty
4. c) advertising site of the city of Shymkent
5. d) advertising site of the medical center, dental clinic, pharmacy
6. https://drive.google.com/file/d/1RdQLyhGx3YQZLbfk-gUUlwMDQX6_q0dG/view?usp=sharing
7. https://drive.google.com/file/d/1OI8WIHODuPnWZuEPnywi_bvx1svefFa5/view?usp=sharing

9. Self-Test Questions (5,5-11)

1. A(n) _____ converts digital signals into analog signals for transmission over phone lines.
2. A(n) _____ network covers a wide geographic area, such as a state or a country.
3. _____ cable transmits data as pulses of light rather than as electricity.
4. _____ refers to waves continuously varying in strength and/or quality; _____ refers to communications signals or information in a binary form.
5. A(n) _____ is a private network that uses a public network (usually the internet) to connect remote sites.
6. A(n) _____ is a computer that acts as a disk drive, storing programs and data files shared by users on a LAN.
7. The _____ is the system software that manages the activities of a network.
8. Modem is short for _____ .
9. _____ is a short-range wireless digital standard aimed at linking cellphones, PDAs, computers, and peripherals up to distances of 30 feet.
10. Any device that is attached to a network is called a _____ .
11. A set of conventions governing the exchange of data between hardware and software components in a communications network is called _____ .

11. Multiple-Choice Questions (9-18)

1. Which of the following best describes the telephone line that is used in most homes today?
   a) coaxial cable
   b) modem cable
   c) twisted-pair wire

d) fiber-optic cable
e) LAN

2. Which of the following do local area networks enable?
a) sharing of peripheral devices
b) sharing of programs and data
c) better communications
d) access to databases
e) all of these

3. Which of the following is *not* a type of server?
a) file server
b) print server
c) mail server
d) disk server
e) database server

4. Which of the following is *not* a short-distance wireless standard?
a) Bluetooth
b) PDA
c) Wi-Fi
d) WAP
e) WiMAX

5. Which type of local area network connects all devices through a central hub, such as a file server?
a) bus network
b) star network
c) mesh network
d) ring network
e) router

6. Which is the type of local area network in which all microcomputers on the network communicate directly with one another without relying on a server?
a) client/server
b) domain
c) peer to peer
d) MAN
e) WAN

7. How do fiber-optic cables transmit data?
a) via copper wire
b) via infrared
c) via AC electric current
d) via radio waves
e) via pulsating beams of light

8. Which one of the following is *not* a network device?
a) Router
b) Switch
c) Hub
d) CPU
e) Bridge

9. What is the name of a network connecting computers that are physically close, within a company, an organization or a household?
a) FTP(File Transfer Protocol)
b) LAN(Local Area Network)

c) WWW(World Wide Web)
d) Extranet
e) Internet
10. Internet is …….
a) a network of networks
b) an ocean of resources waiting to be mined
c) a cooperative anarchy
d) Global Area Network
e) all of the above
11. MAN is a,
a) Cost
b) Company
c) Network
d) Country
e) Name
12. The Internet is a …
a) global system of interconnected computer networks
b) network of LANs uses the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide
c) product owned by Microsoft
d) massive data storage which is accessible to anyone at any time
e) browser
13. What are the four classifications of the Network based on the scale?
a) PAN, LAN, WAN, MAN
b) LAN, optical fiber network, Ethernet, PAN
c) Active, peer-to-peer, client-server, Ethernet
d) Bus, Star, Ring, Mesh
e) PAN, coaxial, twisted-pair wire, Wi-Fi
14. What is not an advantage of using a network in a local organization?
a) A user can log on to a computer anywhere on the network and access their work files from the file server.
b) The technical skills needed to manage a network are much higher.
c) It is much faster to install an application once on a network - and copy it across the network to every workstation therefore the time consumption is less.
d) Can save money by sharing printers, plotters, modems etc.
e) More security of the data.
15. You have a modem and a telephone connection. What else do you need to connect your computer to the internet?
a) Browser and printer
b) ISP account and network
c) Browser and ISP account
d) ISP account and Utility software
e) Hub and bridge
16. What is/are the disadvantage/disadvantages of using network system in an organization?
a) If something goes wrong with the file server the whole network is unable to operate.
b) The technical skills needed to manage a network are much higher than working on a stand-alone computer.
c) Users who use too much bandwidth may prevent others from using the network facilities properly.
d) More security of the data.

e) Less security of the data.

17. IP addresses are

a) based on a hierarchy of assignment (network, sub network and computer).
b) each 16 bits long.
c) usually written in a convenient short hand form called the dotted-octet notation.
d) assigned to computers depending on which Internet network the computer is connected to.
e) each 8 bits long.

18. A … is a computer that controls access to the hardware and software on a network and provides a centralized storage area for programs, data, and information.

a) client
b) PC
c) server
d) tablet
e) laptop

12.True/False Questions (4-8)

T F 1. In a LAN, a bridge is used to connect the same type of networks, whereas a gateway is used to enable dissimilar networks to communicate.
T F 2. Frequency and amplitude are two characteristics of analog carrier waves.
T F 3. A range of frequencies is called a *spectrum*.
T F 4. Twisted-pair wire commonly connects residences to external telephone systems.
T F 5. Wi-Fi signals can travel up to almost 300 feet.
T F 6. Microwave transmissions are a line-of-sight medium.
T F 7. 4G is the newest cellphone standard.
T F 8. Wi-Fi is formally known as an 802.11 network.

13. Using the *10 Strike Network-Diagram* tool build diagrams describing:

1) the hospital's network (Figure 3)
2) video broadcast (Figure 4)

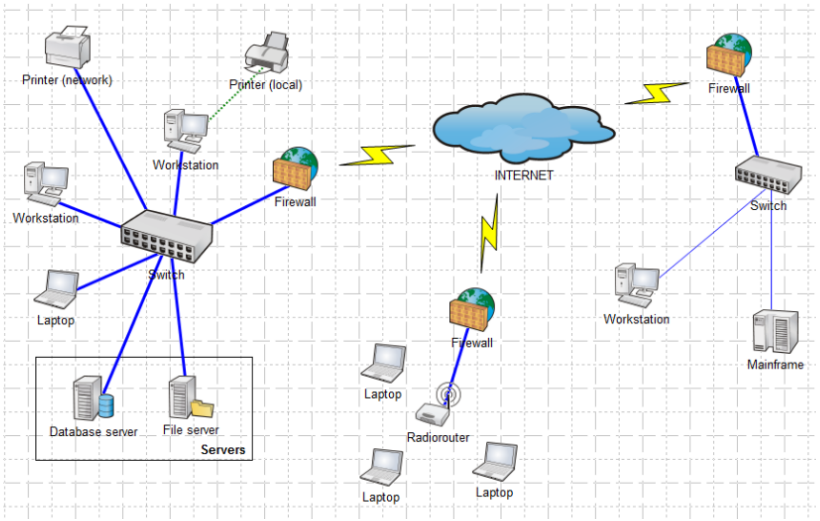


Figure 3

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Work in pairs, partial-search.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.

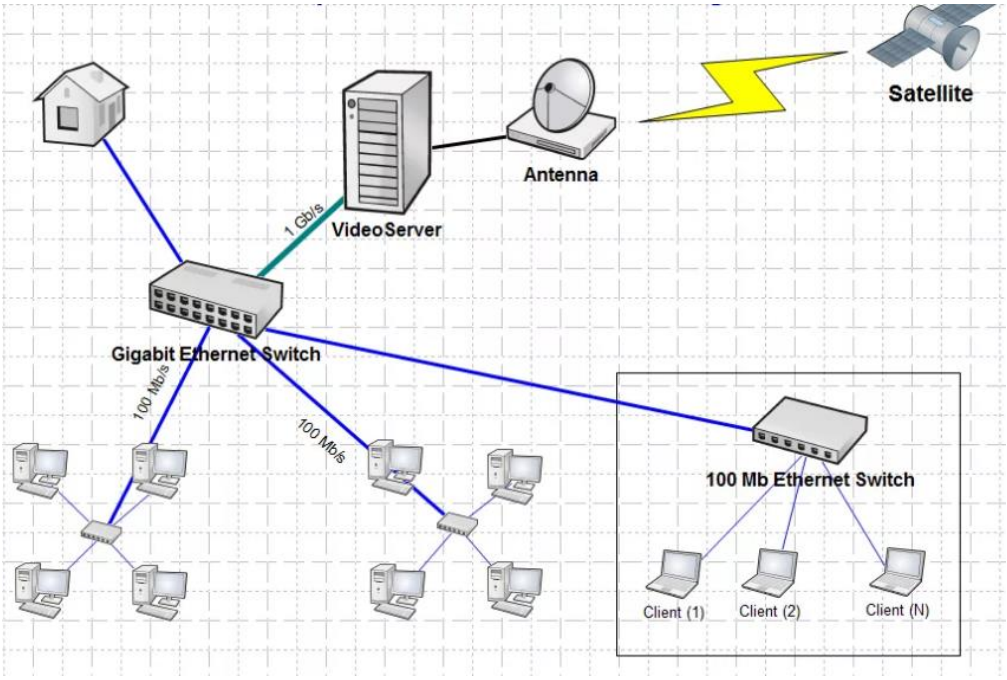


Figure 4

7. References

1. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan
2. Bond K., Langfield S. AQA Computing. - Cheltenham: Nelson Thomes Ltd. 2009. – 514 p.
3. Tanenbaum A., Wetherall D. Computer Networks, 5-th edition. – Prentice Hall. 2010. – 962 p.

8.Control questions:

1.Why do we need to connect computers?
2.What is a computer network?
3.What is the use of a modem?
4.Briefly describe the following network components: client; server; hub; router.
5.What are the differences between a Hub and a Switch?
6.Briefly describe the following categories of networks: PAN; LAN; WAN; MAN.
7.Briefly explain the classifications of networks according to the topology.

Class 4

1. **The theme:** Development of database structure, creation of tables and requests.
2. **The goal:** Acquaintance of students with the database management system and introduce one of DBMS: SQL. Creating a medical database: tables, queries. Work with forms and reports.
3. **The learning objective:** Having studied this class the student will be able to:
   - create a tables;
   - work with tables;
   - import data from other sources;
   - understand what queries are;
   - create a queries;
   - understand what forms are;
   - create a forms;
   -understand what reports are;
   - create a reports.

4. **Key questions of the theme:**

1. What is a Database?
2. What types of database do you know?
3. What is MS Access?
4. What main objects of MS Access do you know?

Practical tasks

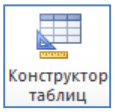
1. Creating a single-table database.

1.1 Start MS Access.

1.2 In the *Blank database pane* on the right-hand side in the window enter the name of database "*General medicine*".

1.3 Click on the *Browse button* (yellow folder) and choose where you would like to save this database. Press *OK*.

1.4 Click on the *Create* (*Создать*) button and you will be present a new database.

1.5 Select the *Create* (*Создание*) tab in the toolbar at the top of the screen, then click on the *Table Design* (*Конструктортаблиц*) button 

in the *Tables* group(*Таблицы*).

1.6 At the top of the *Table Design* window in each row, enter a field names and data types (see table bellow). Use figure 1 as a guide.

Field Name (Имя поля)	Data Type (Тип данных)
DoctorID	Number (Числовой)
FirstName	Short Text (Текстовый)
LastName	Short Text (Текстовый)
Position	Short Text (Текстовый)
CabinetID	Number (Числовой)
WorkingTime	Short Text (Текстовый)
Services	Short Text (Текстовый)

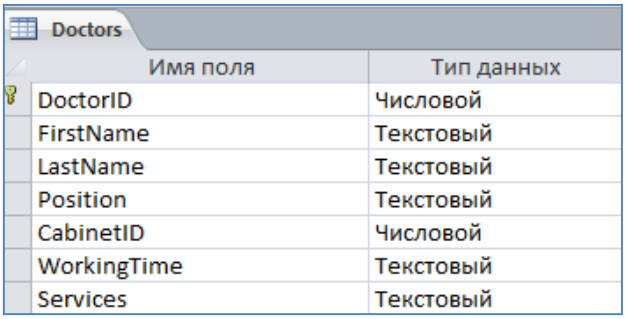


Figure 1.

1.7 In the clinic are two floors and cabinets ID within the range of from 100 to 130 and from 200 to 230.

At the bottom of the *Table Design* window in the *Field properties (Свойстваполя)* partenter the condition for the *CabinetID* field.

In the *Condition for value (Условиеназначение)* row click the *Expression Builder*(*Построительвыражений*) button  , enter the condition: >=100 and <=130 or >=200 and <=230.

In the *Error information* (*Сообщениеобошибке*) row enter "*This ID isn't found*"(figure 2).

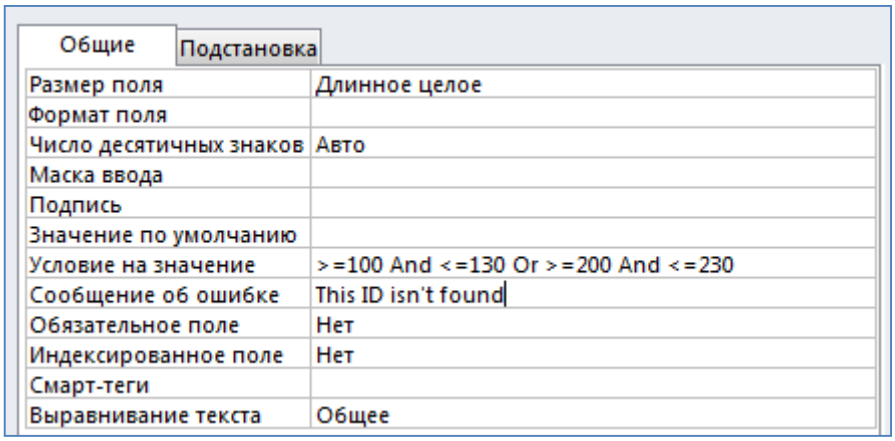
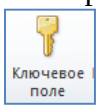


Figure 2.

1.8 Once all the fields are added, click the *Save* icon. Enter a table name "*Doctors*". Click *OK* and you will see your table in the navigation pane.

1.9 A primary key is a field or set of fields with values that are unique throughout a table. Values of the key can be used to refer to entire records, because each record has a different value for the key. Each table can only have one primary key.

Make the *DoctorID* a primary key for this table, so select *DoctorID* field, click on *Primary Key* (*Ключевоеполе*) 

option in the ribbon.

You can see a little key icon that will show up next to that field.

1.10 Save the table and give this table name "*Doctors*".

2. Practical task. Filling the database.

2.1 *Creating a lookup fields*in MS Access tables can help improve the efficiency of the data entry process for your database. A lookup field can display a user friendly value that is bound to another value in the source data table or value list.

2.2 Create the table *Time_LookupField* (figure 3). This table will be used as lookup field for *WorkingTime* field from "*Doctors*" table.

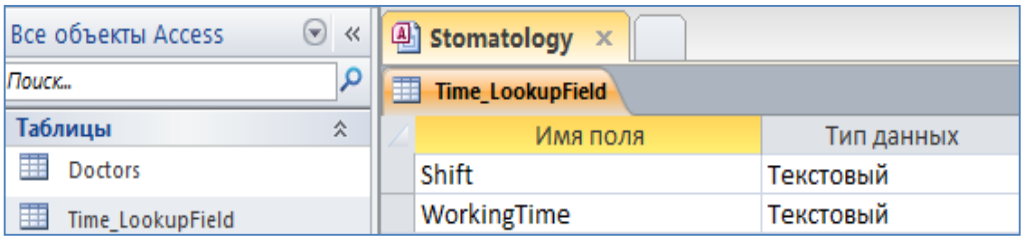


Figure 3.

2.3 Create in MS Excel the table*TypeOfService_ LookupField* (figure 4).

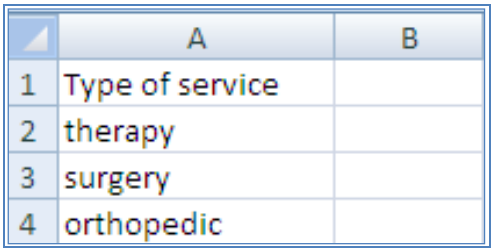


Figure 4.

This table will be used as lookup fieldfor *Services* field from "*Doctors*" table.
2.4 Define cell format – *Text* (*Текстовый*). Save the table*TypeOfService_ LookupField* on the desktop.
2.5 Open database "*Stomatology*"go to *External data* (*Внешниеданные*) tab, select*Excel* option.
2.6 Browse the Excel file from which you want to import data, select the file *TypeOfService_ LookupField*.
1.6. In the next dialog box *Import of spreadsheet* (*Импортэлектронныйтаблицы*) select *List 1* (*Лист 1*), click *Next* (*Далее*) button.
2.7 In the *Preview*, you can see that the first row contains the column headings. Check the check box and click *Next* (*Далее).*
2.8 You will see a dialog box where you can set the data type for each field. If you don't want to import any field, just check the check box which says do not import field. Click *Next* (*Далее*) button.
Here are the different options for primary key. Select the last option *No primary key* (*Несоздаватьключ*) and click *Next* (*Далее*).
2.9 In the last dialog box enter the table name "*TypeOfService_ LookupField*" and click *Finish* (*Готово*).
2.10 Go to the *Navigation pane*. The new table is added here and when you open the newly added table you will see all of your data in Access.
2.11 Create the table *Staff_LookupField*(figure 5). This table will be used as lookup field for *Position* field from "*Doctors*" table. For *Salary* and *Bonus* fields select *Currency* (*Денежный*) format.
2.12 Make the *Position* a primary key for this table.

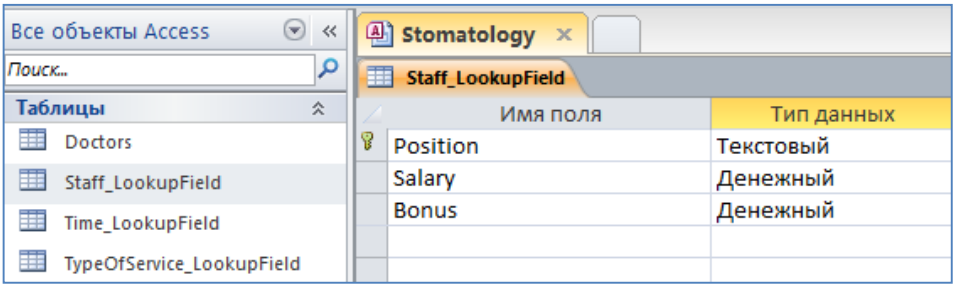


Figure 5.

3. Filling the tables.
3.1 Open the *Time_LookupField*table, enter the data (figure 6).

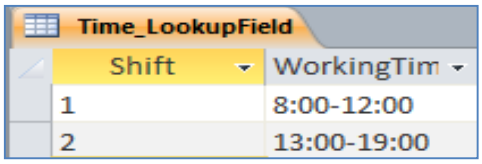


Figure 6.

3.2 Open the *Staff_LookupField*table, enter the data (figure 7).

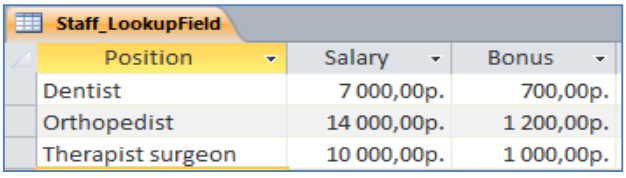


Figure 7.

4. Creating of Lookup Field.

Case 1. Table Design (Режимконструктора)

1.1 Open the *Doctors* table.

1.2 Choose *Home* (*Главная*) tab. Click *Views* (*Режимы*)option in the ribbon. Choose *Table Design (Конструктор).*

1.3 For *Position* field in the *Field properties (Свойстваполя)* part select *Lookup* (*Подстановка*).

1.4 In the *Dysplay Control* (*Типэлементауправления*) row select *Combo box* (*Полесосписком*).

1.5 In the *Row Source* (*Источникстрок*) row select *Staff_LookupField* table (figure 8).

Case 2. Lookup Wizard (Мастерподстановок)

4.6 For *WorkingTime* field in the column *Data Type*select in drop-down menu *Lookup Wizard (Мастерподстановок)* (figure 9).

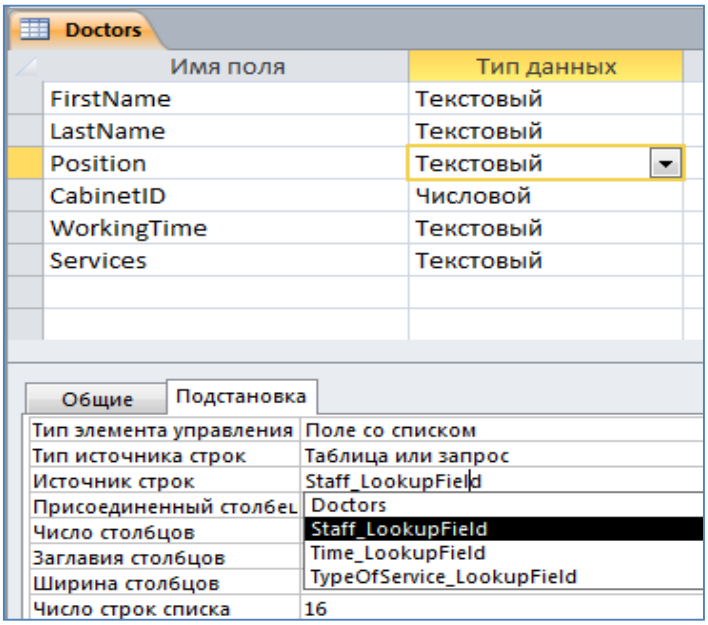


Figure 8.

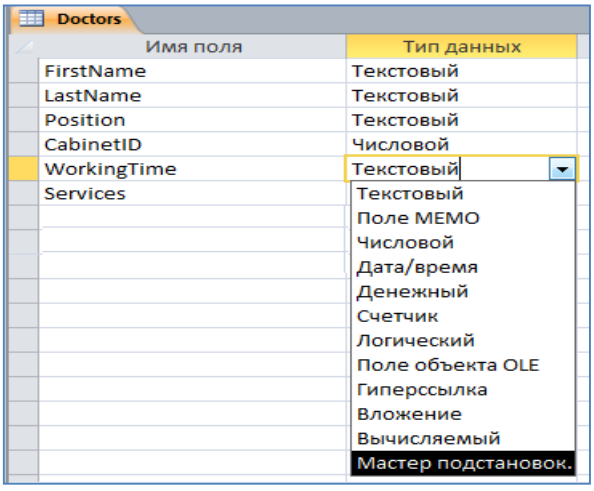


Figure 9.

1.1 In the next dialog box click *Next* (*Далее*) button.

1.2 In the next dialog box select *Table Time_LookupField*, click *Next* (*Далее*) button.

1.3 In the next dialog box from the *Available Fields* (*Доступныеполя*) list, select the *WorkingTime* field, and then click the > button to add it to the *Selected Fields* (*Выбранныеполя*) list, clickseveral

times *Next* (*Далее*) button.
1.4 Click *Finish* (*Готово*) button.

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching, project methods.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey**.**

7. References

1. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashev B.A. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p., ISBN 978-601-7911-04-1 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
2. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
3. Rendell I., Mott J. Advanced database projects in Access 2007. –London, Hodder Education. 2014. https://support.office.com/en-ie/article.

8. Control questions.

1. What are the different ways to create a table in an MS Access database?
2. What are the different ways to create a query, a form in, a report an MS Access database?
3. What is SQL Server?
4. How and why use it?
5. What are the features of MySQL?

Class 5

1. **The theme:** Development of database structure, creation of tables and requests.
2. **The goal:** Acquaintance of students with the database management system and introduce one of DBMS: SQL. Creating a medical database: tables, queries. Work with forms and reports.
3. **The learning objective:** Having studied this class the student will be able to:
   - work with tables;
   - import data from other sources;
   - understand what queries are;
   - create a queries;
   - understand what forms are;
   - create a forms;
   -understand what reports are;
   - create a reports.
4. **Key questions of the theme:**
   1. What are the different ways to create a table in an MS Access database?
   2. What are the different ways to create a query, a form in, a report an MS Access database?
   3. What is SQL Server?
   4. How and why use it?
   5.What are the features of MySQL?

Tasks 1.Case 3. *Query language SQL*

1.5 For *WorkingTime* field in the *Field properties (Свойстваполя)* part select *Lookup* (*Подстановка*).
1.6 In the *Dysplay Control* (*Типэлементауправления*) row select *Combo box* (*Полесосписком*).
1.7 In the *Row Source Type* (*Типисточникастроки*) row select *Table/Query* (*Таблицаилизапрос*).
1.8 In the *Row Source* (*Источникстрок*) row click the*Expression Builder*

(*Построительвыражений*) button and select *View* (*Режим*), *SQL View* (figure 10).

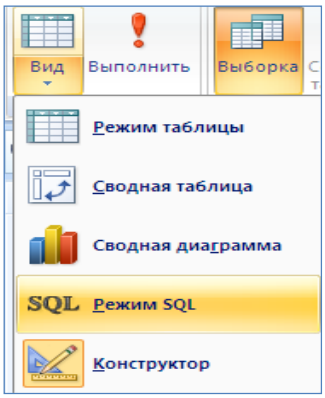


Figure 10.

The query is:
SELECT Time_LookupField.WorkingTime FROM Time_LookupField;
INDEPENDENTLY create the lookup field for *Services* field.
4.15 Enter the data in the *Doctors* table, use lookup fields (figure 11).

DoctorID	DoctorFirstN	DoctorLastName	Position	CabinetID	WorkingTim	Services
1	Denis	Valiullin	Orthopedist	101	8:00-12:00	orthopedic
2	Olga	Dukina	Dentist	203	8:00-12:00	therapy
3	Yana	Elizarova	Orthopedist	102	8:00-12:00	therapy
4	Irina	Leonidova	Dentist	224	8:00-12:00	orthopedic
5	Oleg	Nakipov	Therapist surg	228	13:00-19:00	surgery
6	Igor	Niconenko	Orthopedist	213	13:00-19:00	orthopedic
7	Abai	Ablaev	Dentist	124	13:00-19:00	therapy
8	Alex	Petrov	Therapist surg	221	13:00-19:00	surgery

Figure 11.

2. Practical task. Inserting of the OLE Object.
2.1 Save several photos of different people in the any folder in **.bmp* format.
2.2 Open the"*Doctors*" table.
2.3 In the *Home* (*Главная*)tab of the ribbon click the *Views* (*Режимы*) option and choose *Table Design* (*Конструктор*).
2.4 Add a new field *DoctorPhoto*, type of data – *OLE Object* (*Полеобъекта OLE*).
2.5 Select the *Home* (*Главная*)tab in the toolbar at the top of the screen, then click the *Views* (*Режимы*) group and select *Datasheet View* (*Режимтаблицы*).
2.6 Right-click the *DoctorPhoto* field and choose *Add object* (*Вставитьобъект*).
2.7 In the dialog box select *Create from the file* (*Создатьизфайла*).
2.8 For searching of the file, use the *Browse* (*Обзор*) button (figure 12). Click *OK*.

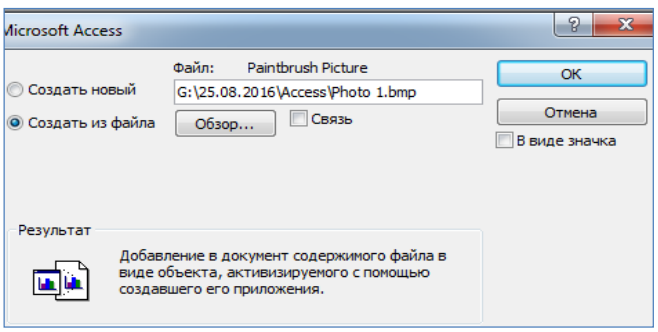


Figure 12.

2. Practical task.Adding a new field in the table.

6.1 Open the"*Doctors*" table.

6.2 In the *Home* (*Главная*)tab of the ribbon click the *Views* (*Режимы*) option and choose *Table Design* (*Конструктор*).

6.3 Add a new field "*Phone*", type of data –*Short Text* (*Текстовый*).

6.4 Click on the *Input Mask* (*Маскаввода*) box on the *General* (*Общие*) tab of the *Field Properties* pane at the bottom of the window.

6.5 Click the  button to the right of the *Input Mask* field. This will open the *Input Mask* wizard which will walk you through the process.

6.6 Save the table.

6.7 In the dialog box select*List* (*Список*) button.

6.8 Enter the data. Use figure 13 as a guide.

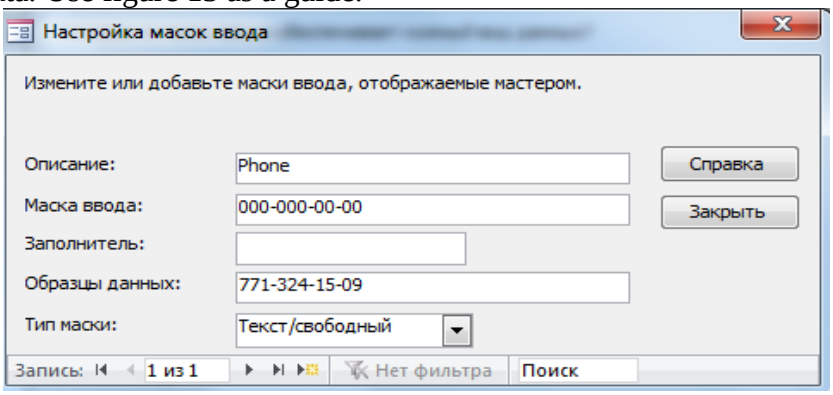


Figure 13.

6.9 Click the *Close* (*Закрыть*) button.

6.10 Click the *Input Mask*from list for *Phone* field.

6.11 Click the *Finish* (*Готово*) button.

6.12 Enter the data for *Phone* field in "*Doctors*" table (figure 14).

Doctors

DoctorID	DoctorFirstN	DoctorLastName	Position	CabinetID	WorkingTim	Services	DoctorPhot	Phone
1	Denis	Valiullin	Orthopedist	101	8:00-12:00	orthopedic	Bitmap Image	771-344-52-34
2	Olga	Dukina	Dentist	203	8:00-12:00	therapy	Bitmap Image	705-456-71-23
3	Yana	Elizarova	Orthopedist	102	8:00-12:00	therapy	Bitmap Image	701-965-42-22
4	Irina	Leonidova	Dentist	224	8:00-12:00	orthopedic	Bitmap Image	777-634-52-34
5	Oleg	Nakipov	Therapist surg	228	13:00-19:00	surgery	Package	771-458-84-55
6	Igor	Niconenko	Orthopedist	213	13:00-19:00	orthopedic	Package	701-588-84-44
7	Abai	Ablaev	Dentist	124	13:00-19:00	therapy	Package	771-668-79-80
8	Alex	Petrov	Therapist surg	221	13:00-19:00	surgery	Package	___-___-__-__

Figure 14.

7. Practical task. Filtering of data.

7.1 Open the"*Doctors*" table.

7.2 Select the *Home* (*Главная*)tab,then click on the *Views* (*Режимы*) group and select *Datasheet View* (*Режимтаблицы*).

7.3 Select the *Position* field.

7.4 Click on *Filter* (*Фильтр*)  option in the ribbon.

7.5 Select *Orthopedist* record, click *OK*.

7.6 The records that contain "*Orthopedist*" are displayed (figure 15).

7.7 Click on *Remove Filter* (*УдалитьФильтр*) 

option in the ribbon. All the records in the table are displayed.

Rename the fields *FirstName* to*DoctorFirstName*, *LastName* to*DoctorLastName* in the table *Doctors.*

Doctors

DoctorID	FirstName	LastName	Position	CabinetID	WorkingTim	Services	DoctorPhot	Phone
1	Denis	Valiullin	Orthopedist	101	8:00-12:00	orthopedic	Bitmap Image	771-344-52-34
3	Elizarova	Yana	Orthopedist	102	8:00-12:00	therapy	Bitmap Image	701-965-42-22
6	Niconenko	Igor	Orthopedist	213	13:00-19:00	orthopedic	Package	701-588-84-44

Figure 15.

8. Practical task. Creating a new tables.
8.1 Start MS Access.
8.2 Create a "*Patients*" table.Enter a field names and data types (see table bellow) (figure 16).

Field Name (Имяполя)	**Data Type (Типданных)**
PatientID	Number (Числовой)
PatientLastName	Short Text (Текстовый)
Address	Short Text (Текстовый)
HealthInsurance	Short Text (Текстовый)
Phone	Short Text (Текстовый)
Gender	Short Text (Текстовый)

Имя поля	Тип данных
PatientID	Числовой
PatientLaslName	Текстовый
Address	Текстовый
HealthInsurance	Текстовый
Phone	Текстовый
Gender	Текстовый

Figure 16.

8.3 Create an*Input Mask* (*Маскаввода*) for *HealthInsurance* field. Use model AB-1234.
8.4 Create an*Input Mask* (*Маскаввода*) for *Phone* field. See task 7.
8.5 Fill the table (not less than 15 records) (figure 17).

Patients

PatientID	PatientLaslName	Address	HealthInsur	Phone	Gender
1	Petrov I.	Shymkent, Amankulov st. 34	AB-1234	771-333-44-66	man
2	Ivanova M.	Shymkent, Kunaev st. 54-98	AB-3456	775-557-89-56	female
3	Kulieva S.	Shymkent, Nekrasov st. 49	AB-7865	701-456-97-81	female
4	Khashimova D	Shymkent, Nursat. 75-34	AB-7866	777-456-78-90	female
5	Kudabaev K.	Shymkent, Kaziev st. 197	AB-3456	771-234-56-76	man
6	Abdrimova A.	Almaty, Gorki st. 543	AB-2345	705-678-94-56	female
7	Vetrova S.	Shymkent, Gagarin st. 234	AB-7865	777-345-67-89	female
8	Halatov E.	Shymkent, Parkovay st. 124	AB-1235	701-234-65-34	man
9	Lim V.	Astana, Divaev st. 34	AB-8907	705-098-76-54	man
10	Godunov I.	Shymkent, Pushkin st. 342	AB-7886	771-987-62-35	man
11	Lomakina T.	Shymkent, Tauke-Khan st. 194	AB-7854	701-555-44-47	female
12	Ivanova G.	Almaty, Amankulov st. 235	AB-3345	775-432-55-66	female
13	Kurakbaeva S.	Shymkent, Nursat 34-123	AB-2222	771-765-43-09	female
14	Denisov D.	Shymkent, Asar 94-25	AB-4569	701-765-43-92	man
15	Ablaev B.	Shymkent, Turkestan st. 84	AB-1113	775-098-72-34	man

Figure 17.

8.6 Create a "*Services*" table.
8.7 Enter a field names and data types (see table bellow).

Field Name (Имяполя)	Data Type (Типданных)
ServiceID	Number (Числовой)
TypeOfService	Short Text (Текстовый)
CharacteristicsOfService	Short Text (Текстовый)
Price	Currency (Денежный)
Discount	Number (Числовой)

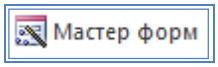
8.8 Fill the table.Use figure 18 as a guide.

	TypeOfService	CharacteristicsOfService	Price	Discount
1	single-rooted pulpitis treatment	therapeutic	6 250,00р.	3
2	double-rooted pulpitis treatment	therapeutic	8 250,00р.	1
3	triple-rooted pulpitis treatment	therapeutic	10 000,00р.	0
4	caries treatment	therapeutic	2 500,00р.	5
5	photopolymer composite filling	therapeutic	1 750,00р.	0
6	periodontitis treatment	therapeutic	7 500,00р.	5
7	dental calculus extraction (one tooth)	surgical	300,00р.	0
8	all the teeth of one jaw brushing (ultrasound)	surgical	4 000,00р.	0
9	professional bleaching of teeth (one tooth)	surgical	1 500,00р.	3
10	dental extraction	surgical	1 000,00р.	0

Figure 18.

8.9 Create a "*Journal*" table.
8.10 Enter a field names and data types (see table bellow).

Field Name (Имяполя)	Data Type (Типданных)
Date	Date&Time (Дата и время)
PatientID	Number (Числовой)
PatientLastName	Short Text (Текстовый)
DoctorLastName	Short Text (Текстовый)
Position	Short Text (Текстовый)
Services	Short Text (Текстовый)
Quantity	Number (Числовой)

8.11 For *PatientID* field create the lookup field from *Patient* table.
8.12 For *DoctorLastName* field create the lookup field from *Doctors* table.
8.13 For *Services* field create the lookup field from *Services* table.
8.14 *PatientLastName* and *Position* fields don't fill.
9. Practical task.Creating the form.
9.1 Open *Stomatology.accdb* file.
9.2 Select the *Create* (*Создание*) tab, then click on the *Form Wizard* (*МастерФорм*) button 

in the *Forms* group.
9.3 From *Tables/Queries* (*Таблицыизапросы*) drop-down list, select *Doctors* table. Click on the double arrow to move all the fields at once, then click *Next* (Далее) button.
9. 4 The following screen in the *Form Wizard* (*Мастерформ*) will ask for the layout that you would like for form. You have *columnar* (*водинстолбец*), *tabular* (*ленточный*), *datasheet* (*табличный*) and *justified* (*выровненный*) layouts. Choose the *justified* layout here and then click *Next* (*Далее*).
9.5 Give a "*Doctors*" name for the form. Choose the first option to O*pen the form to view or enter information* (*Открыть форму для просмотра и ввода данных*) and click *Finish* (*Готово*) button

(figure 19).

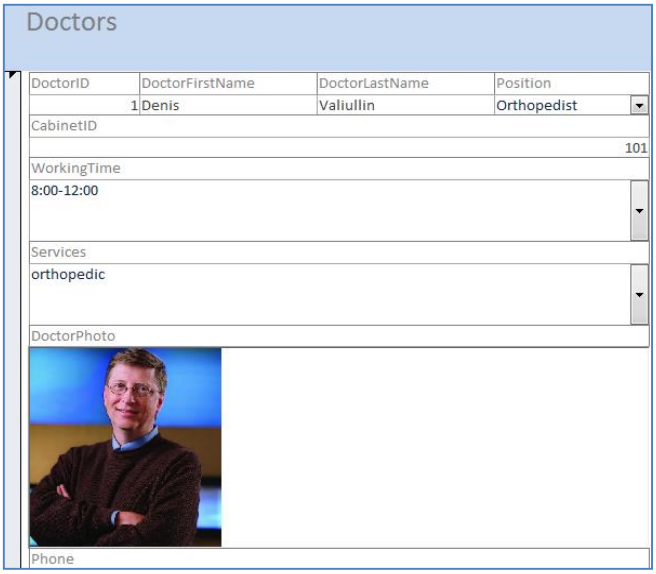


Figure 19.

10. Practical task.Creating thesimple query.
Queries are a way of searching for and compiling data from one or more tables.
10.1 Open *Stomatology.accdb* file.
10.2 Select the *Create* (*Создание*) tab, then click on the *Query Wizard* (*МастерЗапросов*) button 

in the *Queries* (*Запросы)* group.
10.3 Select *Simple Query Wizard* (*Простойзапрос*)then click *OK*.
10.4 From *Tables/Queries* (*Таблицыизапросы*) drop-down list, select *Doctors* table. Use the *arrows*to move the fields from the *Available Fields* (*Доступныеполя*)*:*window into the *Selected Fields* (*Выбранныеполя*)*:* window. Select *Doctor ID, DoctorLastName, Position* fields. Click *OK*.
10.5 Give this query name "*DoctorsPositions*", click *Finish* (*Готово*) button and you will see your query in the navigation pane.
https://www.youtube.com/watch?v=bKUd1RoDVJ4
https://www.youtube.com/watch?v=x_29t3IKULU
https://www.youtube.com/watch?v=49Z2XhHawF0

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching, project methods.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey**.**

7. References

1. Shynybekov D.A and others. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p., (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
2. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
3. Rendell I., Mott J. Advanced database projects in Access 2007. –London, Hodder Education. 2014. https://support.office.com/en-ie/article.

8. Control questions.

1. What are the different ways to create a table in an MS Access database?
2. What are the different ways to create a query, a form in, a report an MS Access database?

3. What is SQL Server?
4. How and why use it?
5. What are the features of MySQL?

Class 6

1. The theme: Processing of numerical information, editing formulas and creation of charts in spreadsheet editors.

2.The goal: The objectives of this class are to provide knowledge and skills in performing calculations for the input data using the formulas and basic functions available in MS Excel, as well as in sorting / filtering the necessary data from an Excel sheet.

3. The learning objective: Having studied this class the student will be able to:

- insert formulas by using arithmetic operations with contents of the cells;
- use the basic functions;
- sort a given list of data into a given criteria;
- filter the required data from a data set satisfying a given condition(s);
- format the cells and the contents.

4. Key questions of the theme:

1. What are the advantages of using computerized Spreadsheets?
2. What are the four different types of operators use in Excel 2010?
3. What is the absolute and relative addressing of cells?
4. What kind of categories of functions embedded in MS Excel do you know?
5. What kind of errors in Excel do you know?
6. When use a "Filter" and "Sort" tools?
7. What are the available tools in Excel 2013 to customize charts?

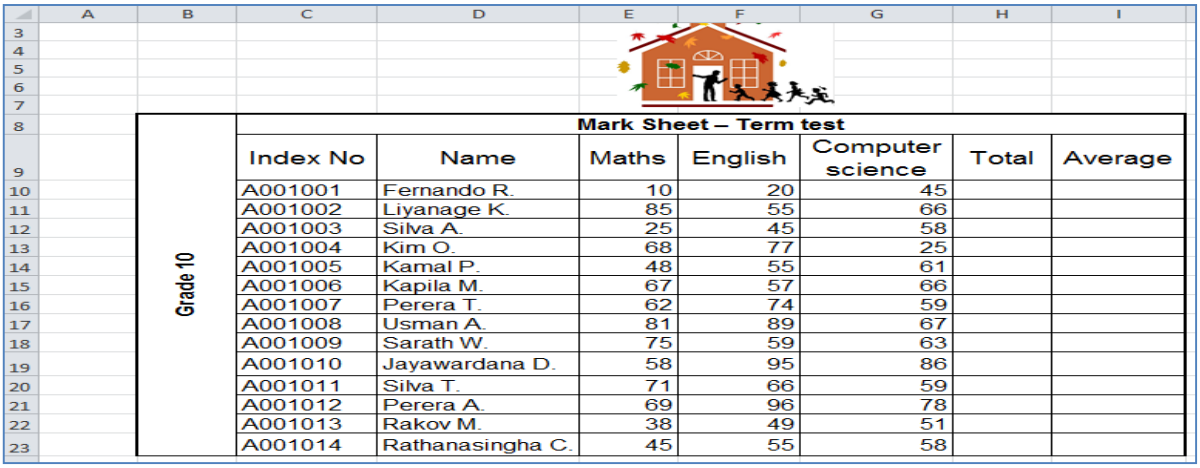
Practical task.

1. Start MS Excel.
2. Create a new workbook and save it as "*Marks.xls*".
3. Change the name of the worksheet "*Sheet1*" (*Лист1*) to "*Marks1*". (Right-click on the sheet name and choose "*Rename*" (*Переименовать*)and rename it).
4. Delete the "*Sheet2*" (*Лист2*) and "*Sheet3*" (*Лист3*).
5. Insert a new worksheet and name it as "*Marks2*".
6. Using figure 1 as a guide, create the table in the worksheet "*Marks1*". .
7. First type the names of the columns.
8. Mergethe necessary cells.
9. Select the column *C* (Index No) and change the column width (*Home* (*Главная*)→ *Cells* (*Ячейки*) → *Format* (*Формат*) → *Cell Size* (*Размер ячейки*) → *AutoFit Selection* (*Автоподбор ширины столбца*).
10. Select the column *D* (*Name*) and change the column width (*Home* (*Главная*) → *Cells* (*Ячейки*) → *Format* (*Формат*) → *Cell Size* (*Размер ячейки*) → *Column width* (*Ширина столбца*) and give a suitable width).
11. Change the width of the column *H* using mouse double-click.
12. Change the column width of column *J* using click on left mouse button on the column header.
13. Select the second row (Index No, Name, …, Total, Average) and change *font size* to 14 and the *row height* to give a suitable height.
14. Change the height of row using mouse (put the mouse pointer at the bottom edge of the row number (1,2,…) and move the mouse while pressing the left mouse button).
15. Complete the rest of the table as follows.

Insert a *picture* as shown below.

16. Click cell *H10* and *enter* the formula: *=E10+F10+G10* press *Enter* button.

17. Click cell *H10*, position the pointer on the lower-right corner of the cell (the fill handle) so that the pointer change to +, drag the to cell *H23*, then release the mouse button.
18. Click cell *I10* and *enter* the formula: *=AVERAGE(E10:G10)* (*=СРЗНАЧ(E10:G10)*) press *Enter* button.
19. Drag the *fill handle* from cell *I10* to cell *I23*.



Mark Sheet – Term test

	Index No	Name	Maths	English	Computer science	Total	Average
Grade 10	A001001	Fernando R.	10	20	45		
	A001002	Liyanage K.	85	55	66		
	A001003	Silva A.	25	45	58		
	A001004	Kim O.	68	77	25		
	A001005	Kamal P.	48	55	61		
	A001006	Kapila M.	67	57	66		
	A001007	Perera T.	62	74	59		
	A001008	Usman A.	81	89	67		
	A001009	Sarath W.	75	59	63		
	A001010	Jayawardana D.	58	95	86		
	A001011	Silva T.	71	66	59		
	A001012	Perera A.	69	96	78		
	A001013	Rakov M.	38	49	51		
	A001014	Rathanasingha C.	45	55	58		

Figure 1.

20. Change the *colors* of column *E, F* and *G* to *yellow, red,* and *orange* respectively.
21. Apply a *pattern* to the text area of column *B.*
22. Apply *cell styles* (*стилячеек*) to the columns *H* and *I.*
23. Save your work.

2. ***Practical task.***

1. Start MS Excel.
2. Create a new file, then save it as "*Payroll Calculator*".
3. Using figure 2 as a guide, create the table "*Health Professionals Payroll Calculator*".
4. Click cell *F11* and enter the formula: *=C11*E11* press *Enter* button.
5. Drag the *fill handle* from cell *F11* to cell *F20.*

Click cell *G11* and enter the formula: *=D11*(2*E11)* press *En ter* button.

At *Hippocrates Medical Clinic*, overtime pay is calcul ated at twice the regular hourly rate times the number of overtime hours. The formula used to calculate overtime pay for the employee in row 11 is: O/T Hrs times (2 times Hrly Rate).

6. Drag the *fill handle* from cell *G11* to cell *G20.*
7. Click cell *H11* and enter the formula: *=F11+G11* press *Enter* button.
8. Drag the *fill handle* from cell *H11* to cell *H20.*
9. Click cell *A21* and enter the word "Total".
10. Click cell *C21* and click the *Sum button* Σ in the *Editing* (*Редактирование*)group on the *Home* (*Главная*) tab on the Ribbon. In cell *C21* formula: *=SUM(C11:C20)* (*=СУММ(C11:C20)*) will appear.
11. Click cell *C21* and drag the *fill handle* from cell *C21* to cell *H21.*
12. Change the *colors* of row 21 to *yellow.*
13. Save your work.

	A	B	C	D	E	F	G	H
1		Health Professionals Payroll Calculator				Week 24		
2								
3		**Hippocrates Medical Clinic**						
4		Address						
5		Kazakhstan, Shymkent						
6		al-Farabi square 1						
7		tel. 8 (7252) 40 82 22						
8		www.hippocrates.kz						
9								
10	Name	Position	Hours	Overtime (O/T) Hours	Hrly Rate	Reg Pay	O/T Pay	Gross Pay
11	Simonov Ivan	Patient Transporter	40	4	12,42			
12	Petrov Denis	Renal Dialysis Technican	35	0	14,15			
13	Kim Olga	Physician Assistant	40	2	37,3			
14	Kudabaev Bulat	Anesthesia Technician	29	0	14,46			
15	Kurakbaeva Sevara	Medical Records Coding Technician	37	0	18,63			
16	Taskulova Aliya	Medical Records Technician	39	0	16,95			
17	Besbaev Gani	Massage Therapist	40	1	21,34			
18	Svetlov Dmitriy	Medical Laboratory Technician	40	8	17,98			
19	Aibekova Zakira	Interventional Radiology Technician	40	6	26,98			
20	Orazov Isabek	Electroencephalograph Technician	38	0	19,83			

Figure 2.

	A	B	C	D	E	F	G	H
1		Health Professionals Payroll Calculator				Week 24		
2								
3		**Hippocrates Medical Clinic**						
4		Address						
5		Kazakhstan, Shymkent						
6		al-Farabi square 1						
7		tel. 8 (7252) 40 82 22						
8		www.hippocrates.kz						
9								
10	Name	Position	Hours	Overtime (O/T) Hours	Hrly Rate	Reg Pay	O/T Pay	Gross Pay
11	Simonov Ivan	Patient Transporter	40	4	12,42	496,8	99,36	596,16
12	Petrov Denis	Renal Dialysis Technican	35	0	14,15	495,25	0	495,25
13	Kim Olga	Physician Assistant	40	2	37,3	1492	149,2	1641,2
14	Kudabaev Bulat	Anesthesia Technician	29	0	14,46	419,34	0	419,34
15	Kurakbaeva Sevara	Medical Records Coding Technician	37	0	18,63	689,31	0	689,31
16	Taskulova Aliya	Medical Records Technician	39	0	16,95	661,05	0	661,05
17	Besbaev Gani	Massage Therapist	40	1	21,34	853,6	42,68	896,28
18	Svetlov Dmitriy	Medical Laboratory Technician	40	8	17,98	719,2	287,68	1006,88
19	Aibekova Zakira	Interventional Radiology Technician	40	6	26,98	1079,2	323,76	1402,96
20	Orazov Isabek	Electroencephalograph Technician	38	0	19,83	753,54	0	753,54
21	Total		378	21	200,04	7659,29	902,68	8561,97

Figure 3.

3.Practical task. Creating charts.

	A	B	C	D	E	F
1		Insurance Reimbursement, by Departament, by Quarter, 2016				
2						
3		**Hippocrates Medical Clinic**				
4		Address				
5		Kazakhstan, Shymkent				
6		al-Farabi square 1				
7		tel. 8 (7252) 40 82 22				
8		www.hippocrates.kz				
9		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
10	Cardiology	53674,03	78604,91	65831,26	61331,47	259441,67
11	Dermatology	35109,94	39214,66	43347,22	45581,19	163253,01
12	Immunology	42487,62	43719,88	45702,11	41006,09	172915,7
13	Neurology	40321,03	44897,42	45791,03	46539,17	177548,65
14	Opthalmology	50827,79	29945,62	35611,23	37125,81	153510,45
15	Ortipedics	14682,55	25103,18	26654,38	28909,52	95349,63
16	Pediatrics	32715,02	35561,44	35792,16	37216,99	141285,61
17	Psychology	71950,61	65427,65	82403,56	70389,12	290170,94
18	Total	341768,59	362474,8	381132,95	368099,36	1453475,7
19						
20	20% rise					
21	Average					
22	Maximum					
23	Minimum					

Figure 4.

1.Start Excel. Open the file "*Insurance Reimbursement Analysis*".
2. Select the range *A9:E17*, then click the *Insert tab* (*Вставка*) on the Ribbon.
3. Click the *Column* (*Гистограмма*) button in the *Charts* group, then choose picture  in the chart gallery (figure 5).

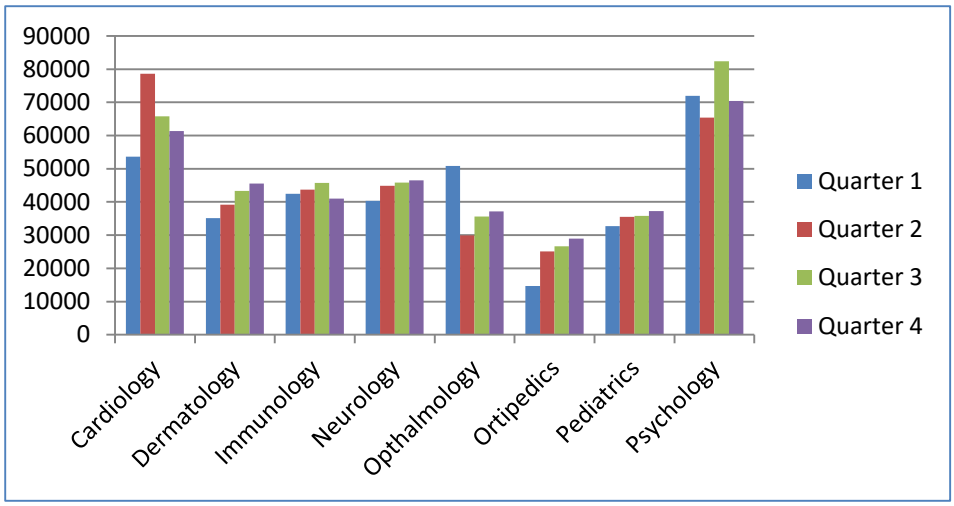


Figure 5.

4. Select the range *A10:A17*, press and hold *Ctrl* button, select the range *F10:F17*, release *Ctrl* button, click the *Insert tab* (*Вставка*), click the *Pie button* (*Круговая*) in the *Charts* group, then choose picture  in the chart gallery.
5. Edit chart as shown in figure 6.

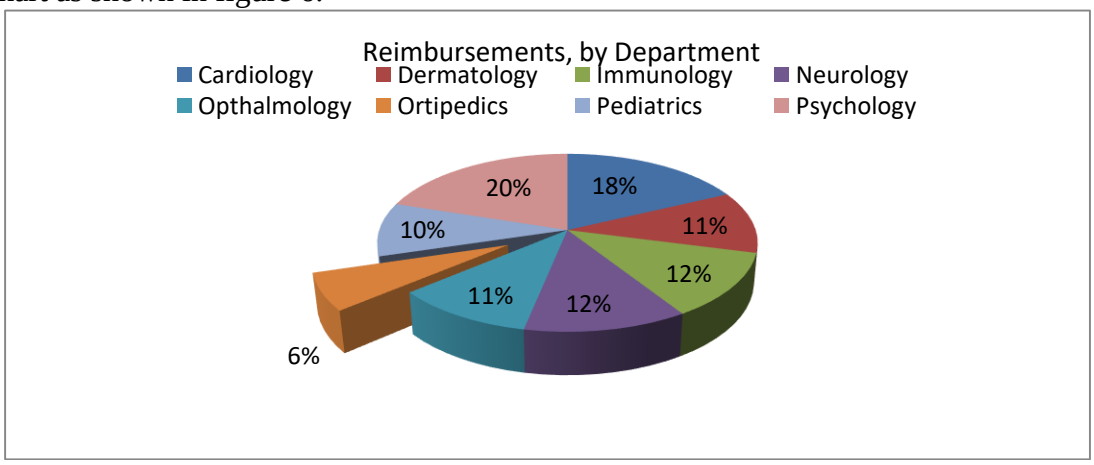


Figure 6.

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching.
6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.
7.References
1. Нурпеисова Т.Б., Кайдаш И.Н. ИКТ. Учебное пособие / Алматы, изд-во Бастау, 2017
2. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty,

2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)

8. Control questions.

1. What are the advantages of using computerized Spreadsheets?
2. What are the four different types of operators use in Excel 2010?
3. What is the absolute and relative addressing of cells?
4. What kind of categories of functions embedded in MS Excel do you know?
5. What kind of errors in Excel do you know?
6. When use a "Filter" and "Sort" tools?
7. What are the available tools in Excel 2013 to customize charts?

Class 7

1. The theme: Design and creation of the presentations of lecture material, scientific reports, etc.

2. The goal: The aims of this class are to give an idea of Forming ideas of stages of creation of the presentation Microsoft Office PowerPoint. Develop skills, additions of drawings, charts and diagrams. Apply special effects, animations, sound and video fragments to strengthening of perception effect of the main information

3. The learning objective: Having studied this class the student can get idea about:

- Creating and Editing a Presentation
- The PowerPoint Window

4. Key questions of the theme:

1. Which of the following method can insert a new slide in current presentation?
2. Which command will you use in PowerPoint if you need to change the color of different objects without changing content?
3. Which file format can be added to a PowerPoint show?
4. What is a slide-title master pair?
5. How can you create a uniform appearance by adding a background image to all slides?
6. Which option on the custom animation task pane allows you to apply a preset or custom motion path?
7. Which of the following features should you use when typing in the notes text box?

Tasks (25-50)

Create presentation on following themes:

1. "My future profession"
2. "My family"
3. "My university"
4. "My hobby"
5. "Information technologies"
6. "Computer devices"
7. "Holidays"
8. "Travelling"
9. "World Wildlife"
10. "Nature"

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.

7. References

1.Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., (A textbook in English with the stamp of the Ministry of Education and Science of the

Republic of Kazakhstan)
2.Lorenzo Cantoni (University of Lugano, Switzerland), James A. Danowski (University of Illinois at Chicago, IL, USA) Communication and Technology, 576 p.
3.Lindros K. PC Basics with Windows 7 and Office 2010. - Jones & Bartlett Learning. 2012.
4.Torben Lage Frandsen. Microsoft Office PowerPoint. – Ventus Publishing Aps. 2011. – 85.

8. Control questions.

Which file format can be added to a PowerPoint show?
What is a slide-title master pair?
How can you create a uniform appearance by adding a background image to all slides?
Which option on the custom animation task pane allows you to apply a preset or custom motion path?

Class 8

1. **The theme:** Cybersecurity.
2. **The goal:** The aim of this lesson is for students to understand the state of current cyber-threats occurring in our world and leave knowing how to manage their own risk to help reduce this global loss.
3. **The learning objective:** Having studied this lesson the student will learn the basics of securing their devices from outside interference and cyber-criminals, in order to protect their data and identity online.
4. **Key questions of the theme:**
   1. What are you aware of threats to information security?
   2. What is phishing?
   3. What is cybersecurity?
   4. What is online privacy?
   5. What is encryption?
   6. How can you prevent a cyberattack on your personal devices?

Theory:

1. Cybersecurity

Computer security is a section of information security that characterizes the impossibility of causing damage to a computer in excess of the amount of acceptable damage to it from all identified and studied sources of its failures under certain operating conditions and at a given time interval.

2. Encryption

Encryption is a process that encodes a message or file so that it can be only be read by certain people. Encryption uses an algorithm to scramble, or encrypt, data and then uses a key for the receiving party to unscramble, or decrypt, the information.

3. Phishing

Phishing is a type of Internet fraud, the purpose of which is to gain access to confidential user data - logins and passwords.

4. Online privacy

Online privacy is part of data privacy. Privacy concerns have been posed since the beginning of large-scale computer-assisted information exchange. ... Personal information is any information that can be used to identify a person.

5. Computer viruses

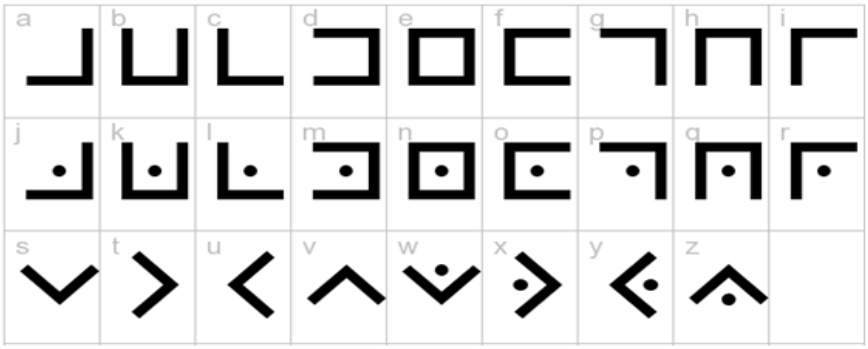
A computer virus is a type of malicious software that can inject itself into the code of other programs, system memory areas, boot sectors, and distribute copies of itself through various communication channels. The main purpose of the virus is to spread it.

Tasks

10. Read the theory.
11. Answer google form questions (5-10)

https://docs.google.com/forms/d/e/1FAIpQLSfgY1XeuGZ2dVORhTuk8FLZcXZJUzD1Ybh17RnNuBsqcvnRiA/viewform?usp=sf_link

12. Using the cipher below encode and decode the words (5-10)



Plaintext	Ciphertext
Encoding	
Software	
Algorithm	
Cybersecurity	
Clue: they used to be the population that used this type of cipher the most!	

4. Define the term"phishing"?: (10-20)
Your answer:__
._____
_____
_____
_____

List the signs that indicate that the letters given below are phishing:
1.__Dear valued customer of TrustedBank
__We__have__receieved__notice_that_you_have_recently_attempted_to_withdraw__the_following_amount_from____your_checking__account_while__in_another_____country_$135
25_____
_Thank__you_____TrustedBank___
_____2._Due__Valued_Customer_____
_____Failture_ton do this 24hrs will lead to restricted access to your account for security reasons
__Sorry__fo_the__inconvierce_____Regards_____
_____
___Royal__Bank__Of_Scotland_____
3.__От:_mail@mail.ru_____Дата:_21_н

оября__11:54_____Кому:_____
_____Тема__Администрация_M@il.ru_____
4._20 сентября 2004 г. На ваш текущий счет был получен перевод в иностранной валюте на сумму, превышающую USD2.000.

Letter 1.

TrustedBank™

Dear valued customer of TrustedBank,

We have recieved notice that you have recently attempted to withdraw the following amount from your checking account while in another country: $135.25.

If this information is not correct, someone unknown may have access to your account. As a safety measure, please visit our website via the link below to verify your personal information:

http://www.trustedbank.com/general/custverifyinfo.asp

Once you have done this, our fraud department will work to resolve this discrepency. We are happy you have chosen us to do business with.

Thank you,
TrustedBank

Letter 2.

RBS Make it happen
The Royal Bank of Scotland
Digital Banking

Dear Valued Customer,
Due to the recent amount of fraudlent messages that targeted our customers recently. Royal bank of scotland has decided to upgrade the security of our online banking digital system. To do this we need the proper verification of each and everyone of our customers. We were unable to reach you by phone thereby sending this email as an alternative to please verify your account information by clicking on the Login button below

LOG IN

Failure to do this within 24hrs will lead to restricted access to your account for security reasons

Sorry fo the inconvience

Regards
Royal Bank Of Scotland

Letter 3.

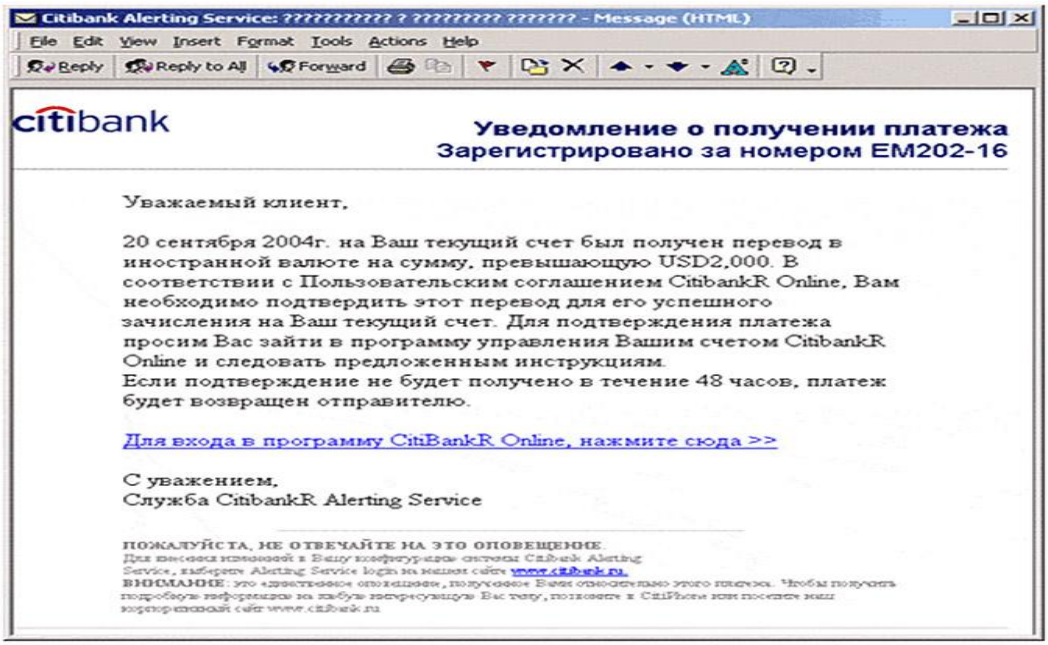
От: mail@mail.ru
Дата: 21 ноября [redacted] 11:54
Кому:
Тема: Администрация M@il.ru

Добрый день.

В связи с проблемами, возникшими на нашем сервере, DNS-сервер перезагрузился, чем вызвал сбой в работе MYSQL базы данных. Возникла проблема с отправкой и получением писем через Web интерфейс. Просим вас выслать на наш резервный адрес: dnsserver@mail.ru пароль вашей почты для восстановления нормальной работы прокси клиента.

Надеемся на ваше понимание администрация M@il.ru

Letter 4.



5. Password Strength (5-10)

Open this site: https://howsecureismypassword.net/ and follow the guide below.

- Create a few passwords using 8 lowercase characters (a-z). What's the longest amount of time-to-crack you are getting?

Using any characters on the keyboard, what's the longest amount of time-to-crack you can generate with an **8-character** password?

- What seems to be the single most significant factor in making a password difficult to crack? Why do you think this is?

Your answer:_____
_____
_____

What should NOT be your password?

Your answer:_ Any number that people can easily associate with you doesn't belong in **your password**. Phone numbers are too easy to link to **your** account, and leaving **your** Social Security number in **a** database (even **a** supposedly secure **password** database) is just too dangerous. Keep **your** personal numbers out of **your password**._____
_____

6. Privacy Activity (10-20)

Research Yourself

Overview: Do you know how much data about yourself is freely online? If someone were to research you, what would they be able to find? What could they know about you from a simple search? Lets go digging for the data you can find about yourself.

Instructions: Begin by typing in your name. Then, try your name + your school or the name of your city. Even try your name + a sport you play! You can look at search engines, your school website,

social networks, or any other frequently used website! You can even include posts from social media sites if you can find them.

Record What You Find!

Information	Where you found it
Information about myself	**https://vk.com/feed**

7. Matching Worksheet "Spot the Attack!" (5-10)

A. Affected over a billion accounts that happened right as the company was trying to sell their business to **Verizon**. Users were advised to turn on **two-factor authentication** (after you put in your password, it sends a code to another device that only you would have to make sure it is you logging in, just in case a hacker has your password).	____ WannaCry, 2017
B. Credit and debit cards were compromised **right during holiday season.** After, consumers were advised to check their bank accounts for fraud and report unusual activity right away.	____ Uber breach, 2018
C. **World's most massive ransomware attack,** affecting over 153 countries and shutting down computers in hospitals. Began by companies failing to update their Microsoft Operating Systems	____ Yahoo breach, 2016
D. Company paid $100,000 to cover up data breach that compromised 57 million customer records. **Breach was not made public until months later.**	____ Equifax breach, 2017
E. Quizzes about personality traits were sent to around 300,000 Americans on this platform. These "profiles" were sold to a	____ Abbott Recall, 2017

company that then used the information to tailor political messaging. **There has been A LOT of recent talk about this scandal.**	
F. Compromised the data of 145.5 MILLION users, including people who did not even know they used this service to manage their **credit scores.** Customers lost trust in this company and their stocks plunged.	___ Facebook Breach of Trust, 2018
G. FDA announced that a **half a million pacemakers** require a security update because of vulnerabilities found that threatened rapid battery repletion or altered pacing.	____ Target, 2014
H. Confidential documents, including **movies** that were not supposed to be released yet and emails from actors were released.	___ Sony Hack, 2014

8. Describe each type of computer virus (10-20)

Virus	Description
Boot Sector Virus	
Direct Action Virus	
Resident Virus	
Multipartite Virus	
Polymorphic Virus	
Overwrite Virus	
Spacefiller Virus	
File Infector Virus	

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: computer work, partial-search.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task

7. References

1. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan
2. Bond K., Langfield S. AQA Computing. - Cheltenham: Nelson Thomes Ltd. 2009. – 514 p.
3. Tanenbaum A., Wetherall D. Computer Networks, 5-th edition. – Prentice Hall. 2010. – 962 p.

8.Control questions:

1. What are you aware of threats to information security?
2. What is phishing?
3. What is cybersecurity?
4. What is online privacy?
5. What is encryption?
6. How can you prevent a cyberattack on your personal devices?

Class 10

1. The theme: Operation with Smart-applications: Smart TV, Smart Hub, etc.
2. The goal: The aim of this lesson is to teach students the basics of creating project skills by working with Google Slides.
3. The learning objective: The student will be able to:
- use Google Slides;
- find out what green technologies are in ICT.

4. Key questions of the theme:
1. What is Google Slides?
2. How to create a Google Slides presentation?
3. What templates can be used to create educational presentations?
4. How students can use Google Slides in the class?

Tasks
Read the brief theory: https://www.google.kz/intl/ru/slides/about/
2. Open your Google account and create the presentation for following themes:
   2.1 SMART technology
   2.2 Types of SMART technology
   2.3 SMART city
   2.3 SMART home
   2.4 Green technologies in ICT
   2.5 SMART TV
   2.6 SMART Hub
   2.7. Correctly use SMART-services

(You can use this video https://www.youtube.com/watch?v=KD-naKQisOU)
3. Insert the images upload the computer.
4. For insert video use the tool searching the web and insert by URL. Format options:
- Play automatically
- For insert only some part this video use the timeline menu

5. Use the hyperlinks tool to quickly move between slides.
6. Save your file as presentation type with extension .pptx
7. Share your link and file via Platonus (You can use this video https://youtu.be/yyFK_tCDBJk)

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: discussion.
6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.
7. References
1. June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2014.
2. Shynybekov D.A. and others. Information and communication technology. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p. (A textbook in English with the stamp of the Ministry of

Education and Science of the Republic of Kazakhstan)
3. Vijay K. Vaishnavi. Design Science Research Methods and Patterns: Innovating Information and Communication Technology, 2nd Edition 2015 by CRC Press
4. Hans J Schnoll E-Government: Information, Technology, and Transformation: Information, Technology, and Transformation (Routledge, March 12, 2015 - Political Science - 343 p.)
5. The Millennium Development Goals Report 2015, United Nations, New York, 2015

8. Control questions:

1. What is Google Slides?
2. How to create a Google Slides presentation?
3. What templates can be used to create educational presentations?
4. How students can use Google Slides in the class?

Class 10

1.The theme: Operations with services on the website of the electronic government

2.The goal: This lesson introduces students to the services they can obtain from the e-government website.

3.The learning objective: **Having studied this lesson the student will be able to:**

- obtain his personal digital signature;
- use the services of the e-government website.

4.Key questions of the theme:

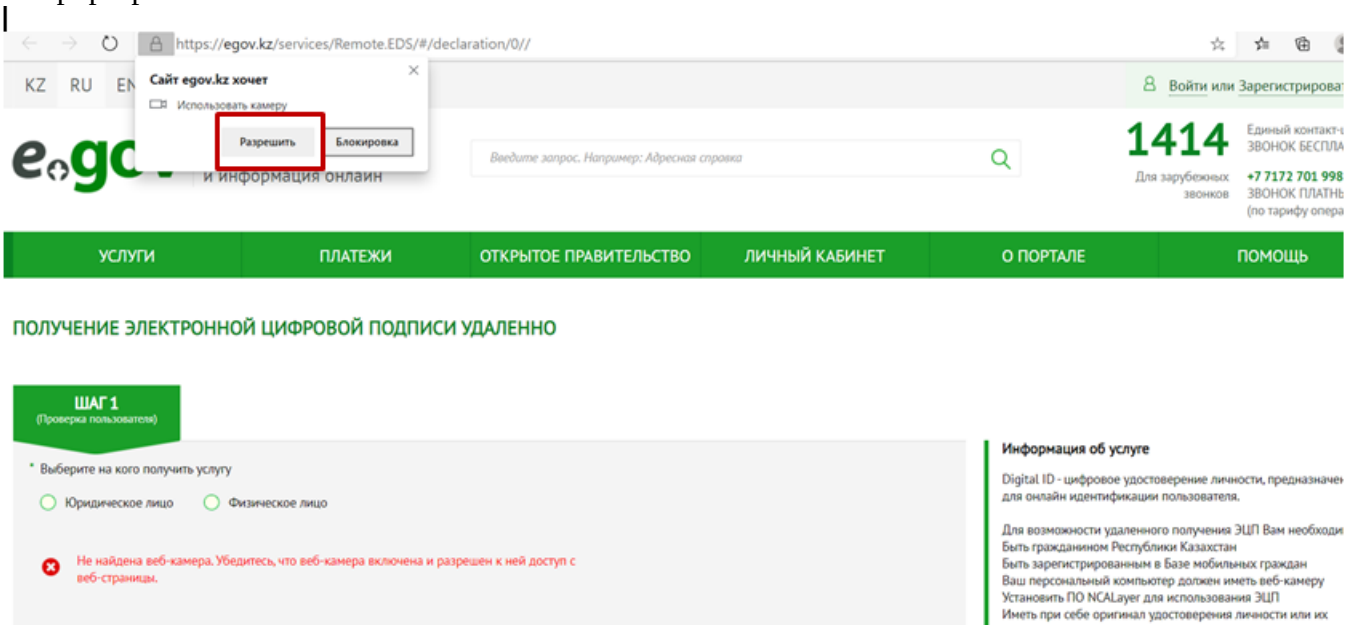
1.Electronic digital signature.
2.The services of the e-government website.

Tasks

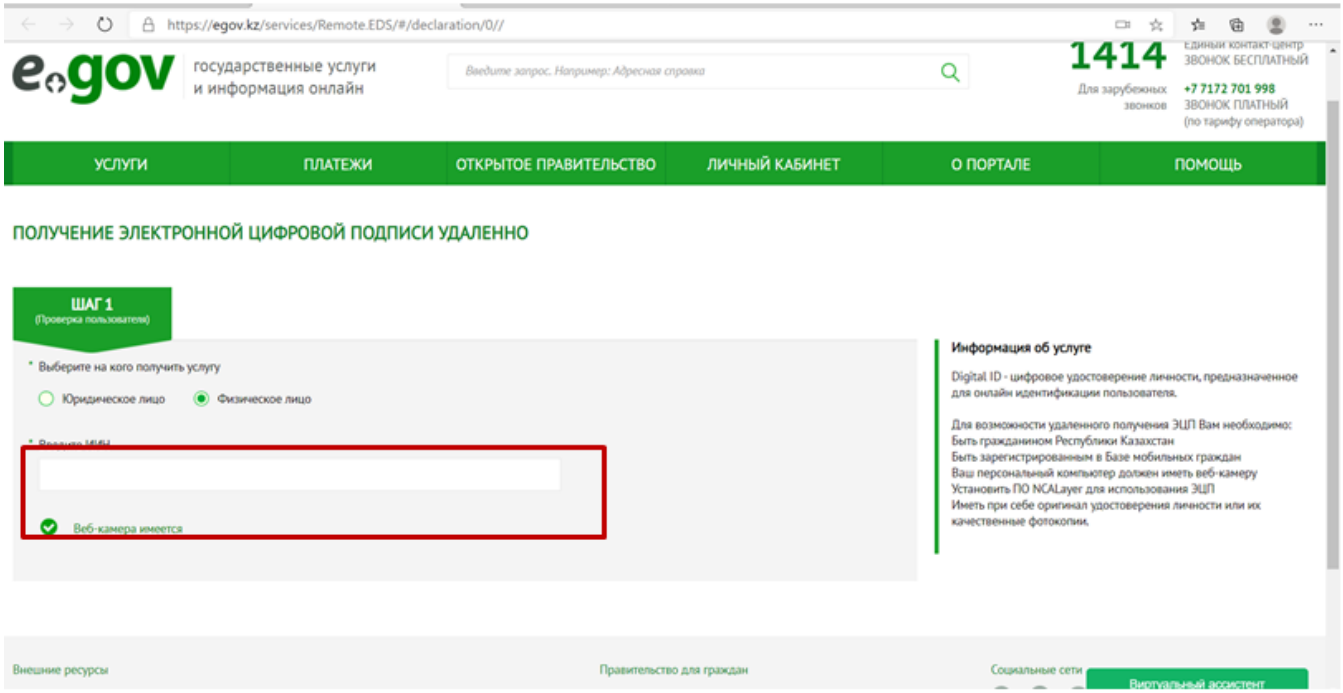
1. You have to obtain digital signature keys of National Certification Authority of the Republic of Kazakhstan via remote identification. (50)

Step-by-step instruction:

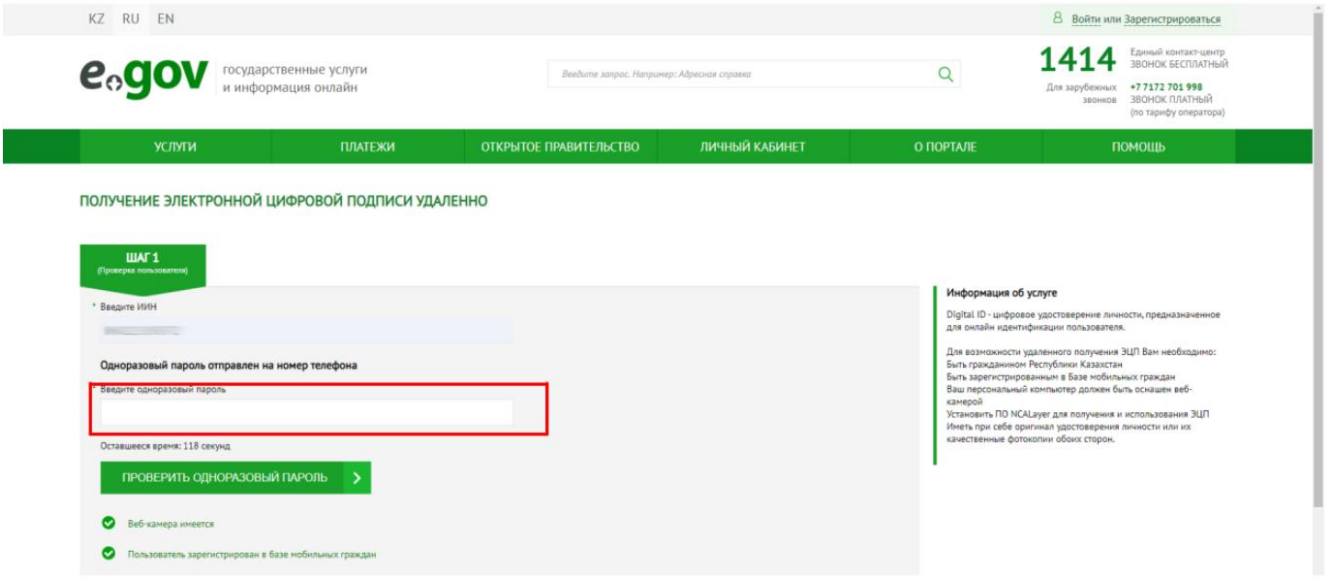
1. On the homepage of e-Gov Portal (Egov.kz) click "Obtain digital signature remotely" button.
2. The system will check whether your personal computer has an installed webcamera. Click "Allow" in pop-up window.



3. Next, indicate your IIN so that the system could check whether your phone number is registered in Mobile Citizens Database (hereinafter: MCD).



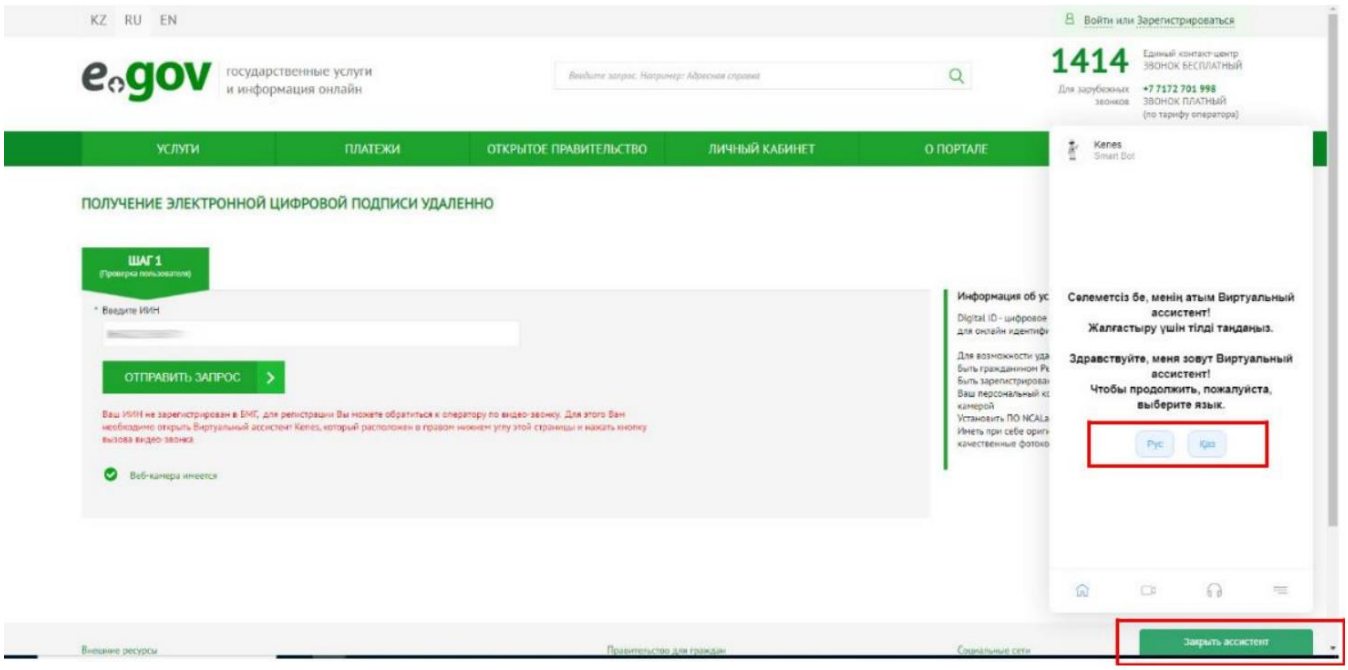
4. In case if check has been successful, indicate SMS-code (one-time password) sent from 1414 to a phone number registered in MCD*.

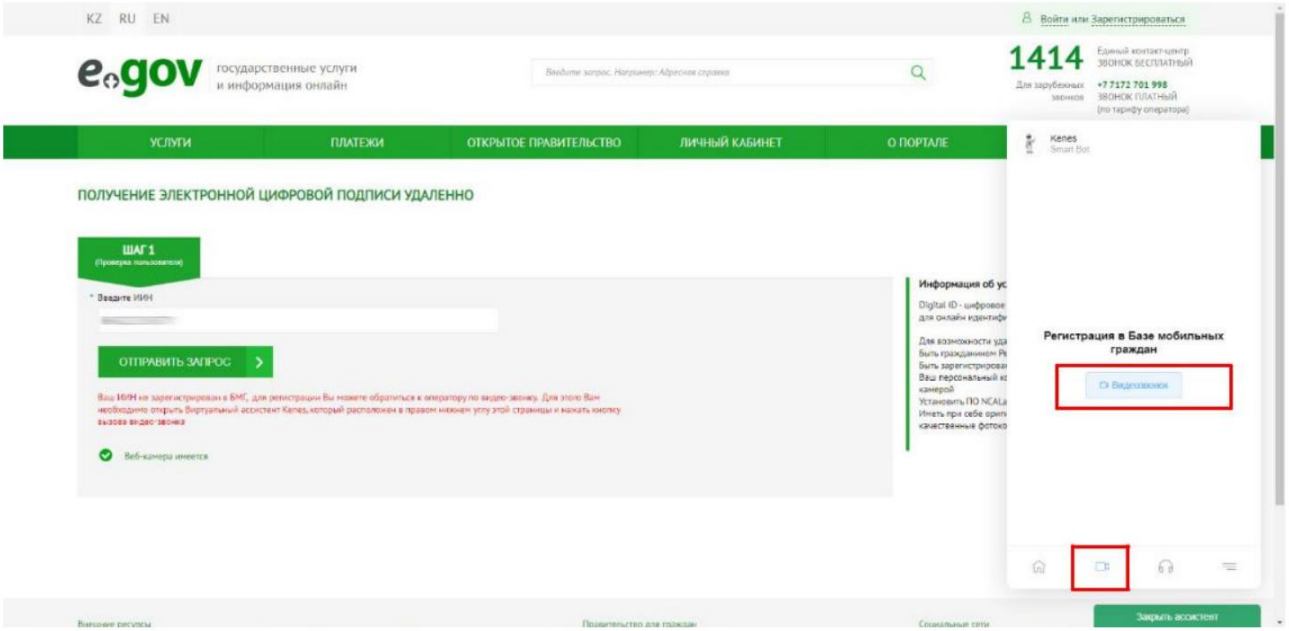


*Note! In case if you are not registered in Mobile Citizens Database (hereinafter: MCD) or you haven`t received a one-time password, the system will offer you to register/re-register your phone number pursuant to the clause 5 of the guidance.

5. *Registration/re-registration of phone number in MCD (if required): Click on virtual assistant Kenes located on the right lower side of the webpage and select a language.

Afterwards, click  icon in the lower panel of the assistant and then click "Video Call" button.

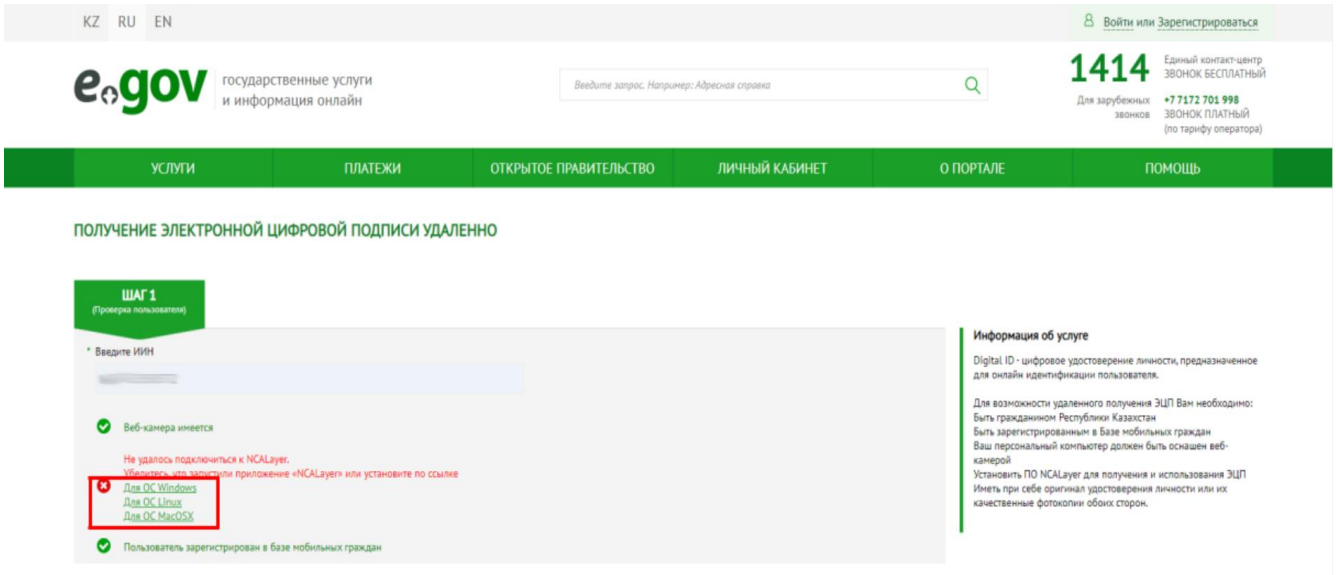




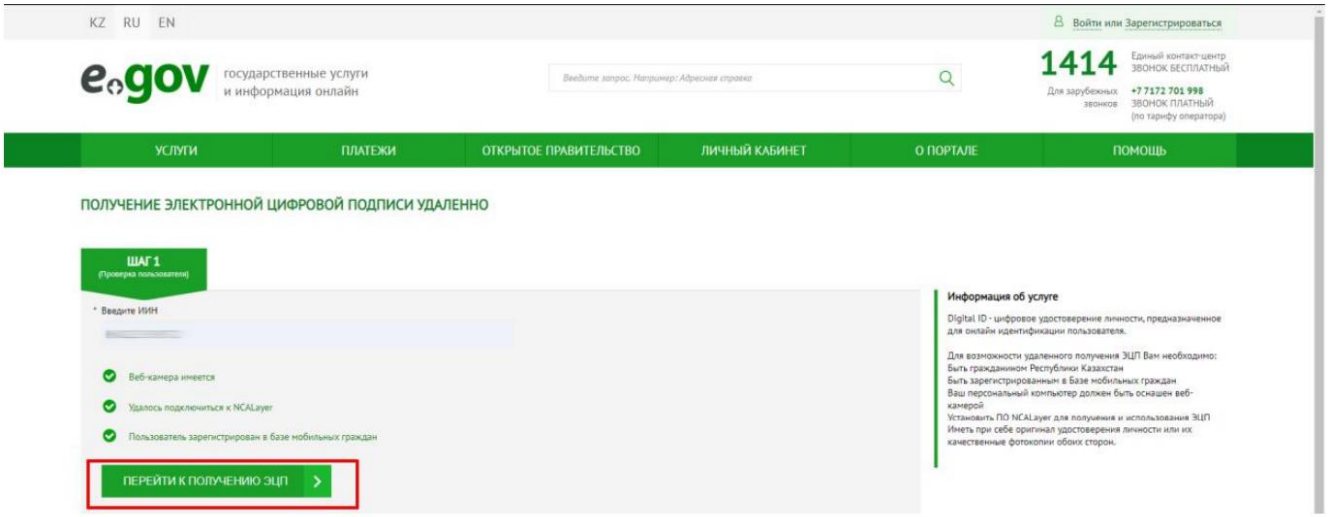
After the start of video call, an Operator will ask you to show your national ID, dictate your IIN, phone number and SMS-code. After successful registration in MCD, refresh the Portal webpage and fill in your IIN once more as well as one-time password pursuant to steps indicated in caluses 2,3.

6. The system will check whether NCALayer is installed/ran on your personal computer*.

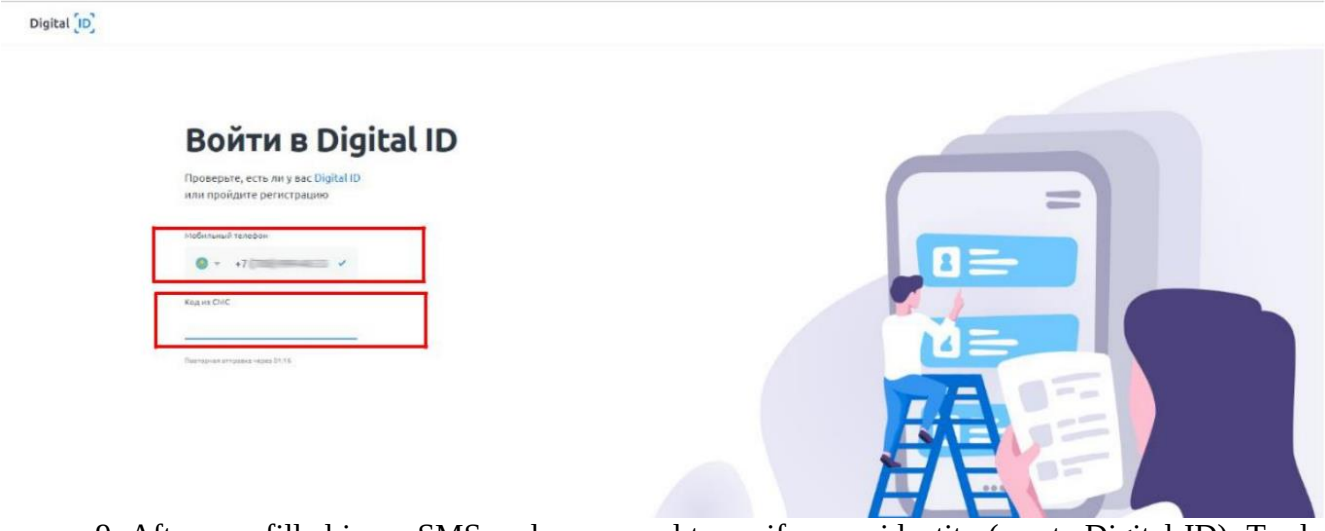
*In case if NCALayer is not installed, the system will offer to download a setup file for NCALayer software. User manual on how to install NCALayer is available on the website of National Certification Authority of the Republic of Kazakhstan (hereinafter: NCA of RoK) by the following link: http://www.pki.gov.kz/nl_ru .



7. After NCALayer is installed, click "Go to obtainment of digital signature" button.

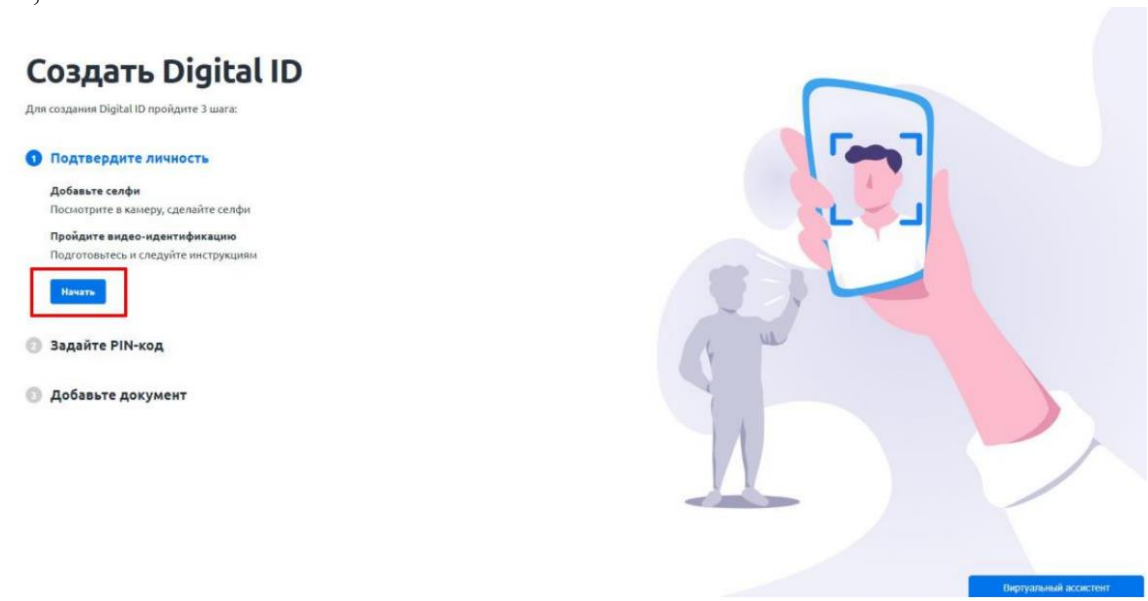


8. Remote identification page will open where you need to fill in your phone number registered in MCD and SMS-code.

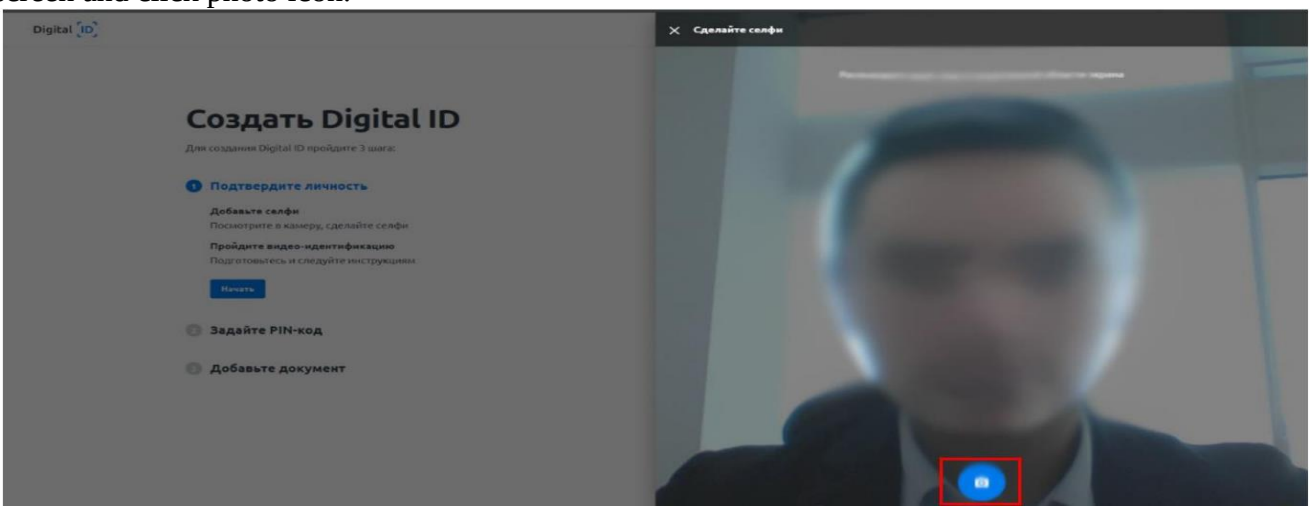


9. After you filled in an SMS-code you need to verify your identity (create Digital ID). To do

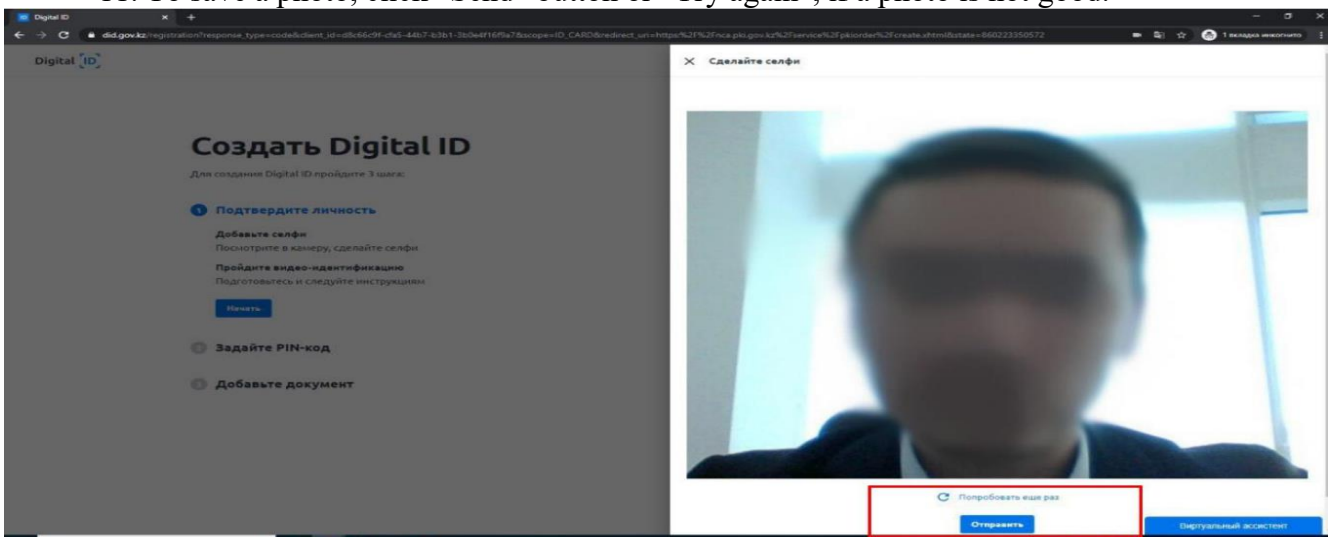
this, click "Start" button.



10. A window will appear where you can make a selfie. Locate your face in the center of the screen and click photo icon.

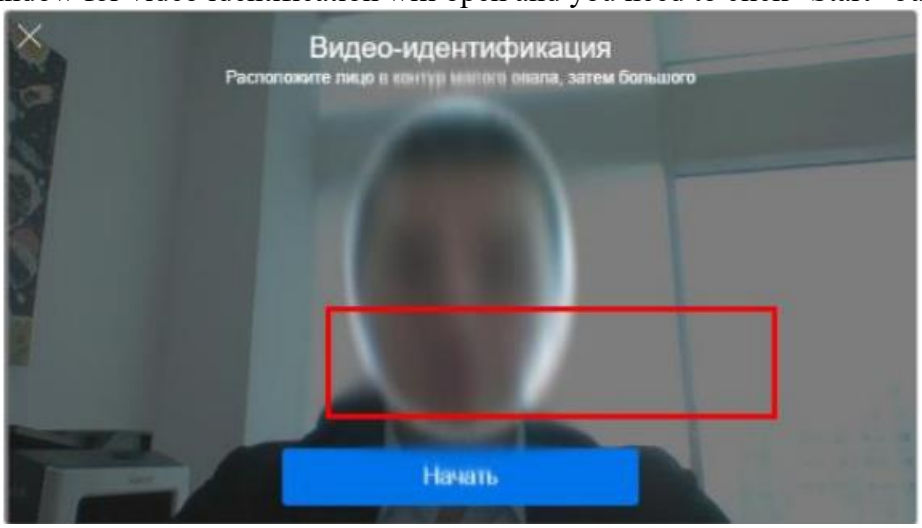


11. To save a photo, click "Send" button or "Try again", if a photo is not good.

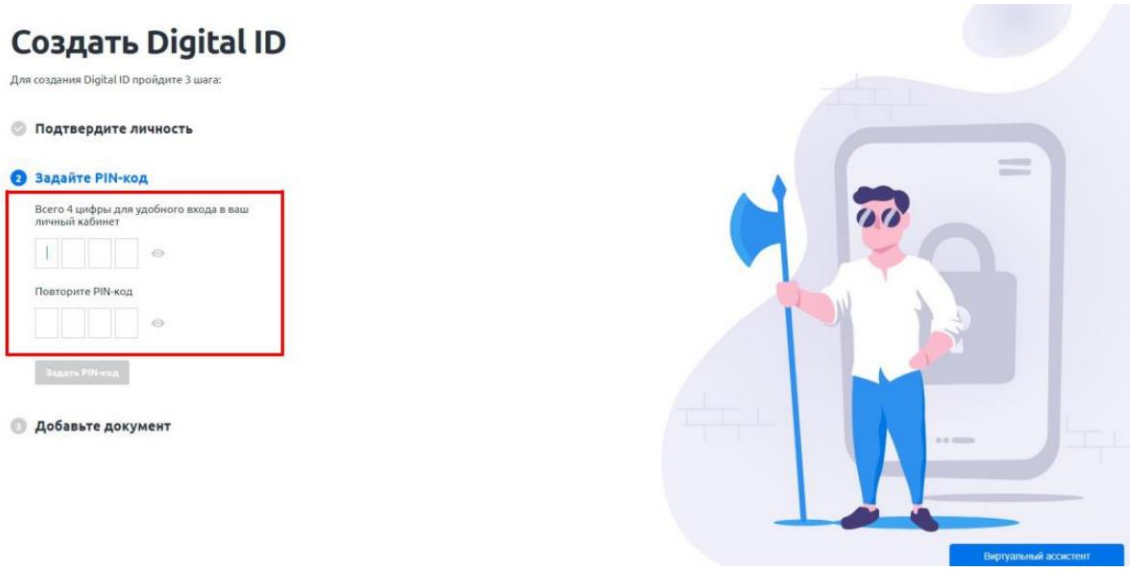


12. Then, click "Continue" button to undergo video identification.

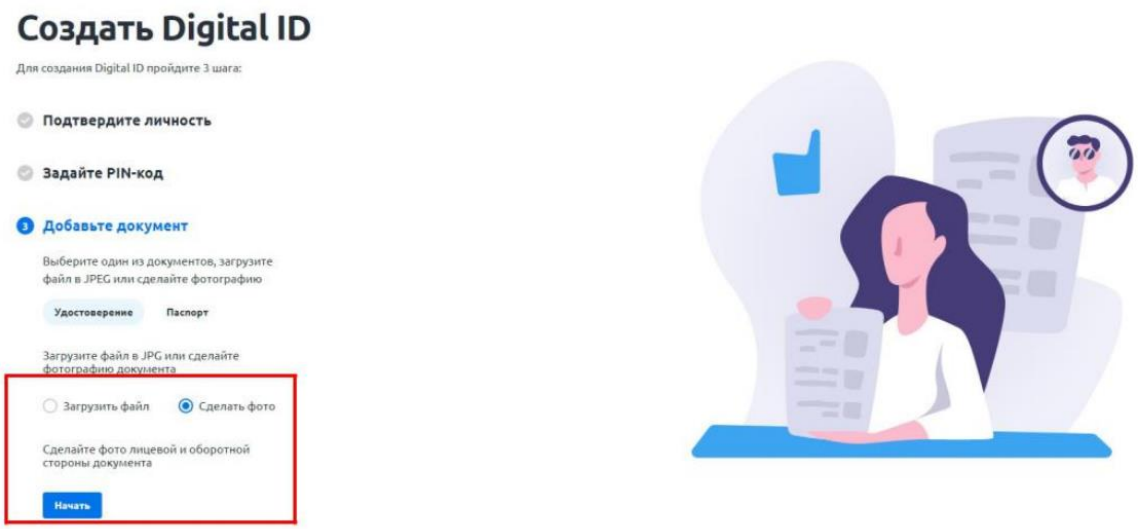
13. A window for video identification will open and you need to click "Start" button.



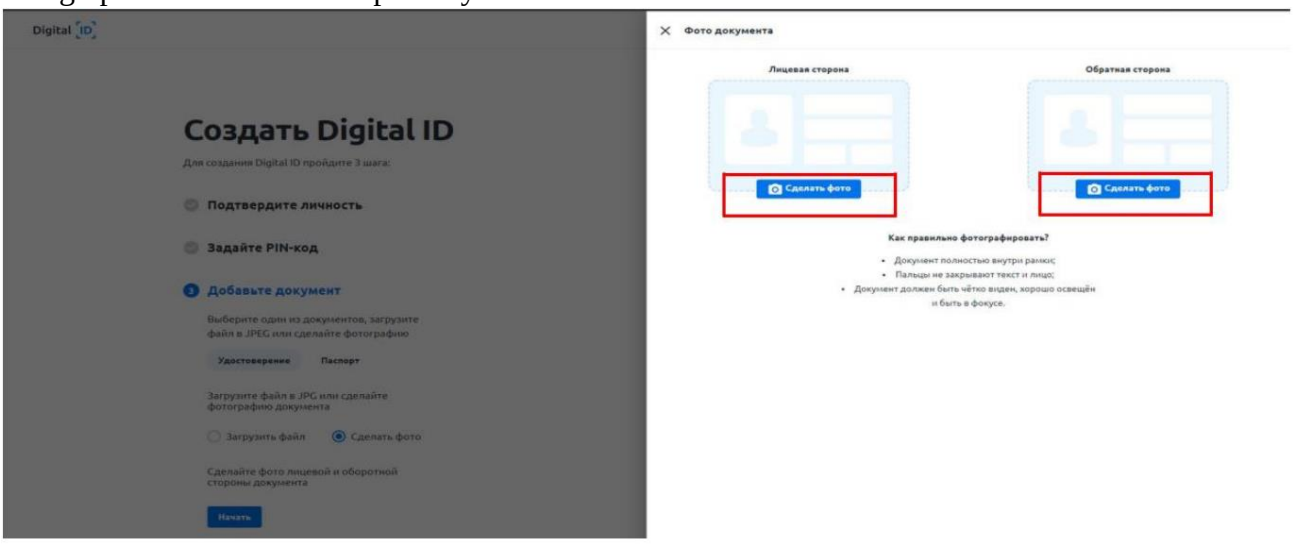
14. The process of video identification will start. You should follow a set of recommendations regarding location of your face and motions. After successful video identification, you need to set a PIN-code for further access to account by clicking "Set PINcode" button.



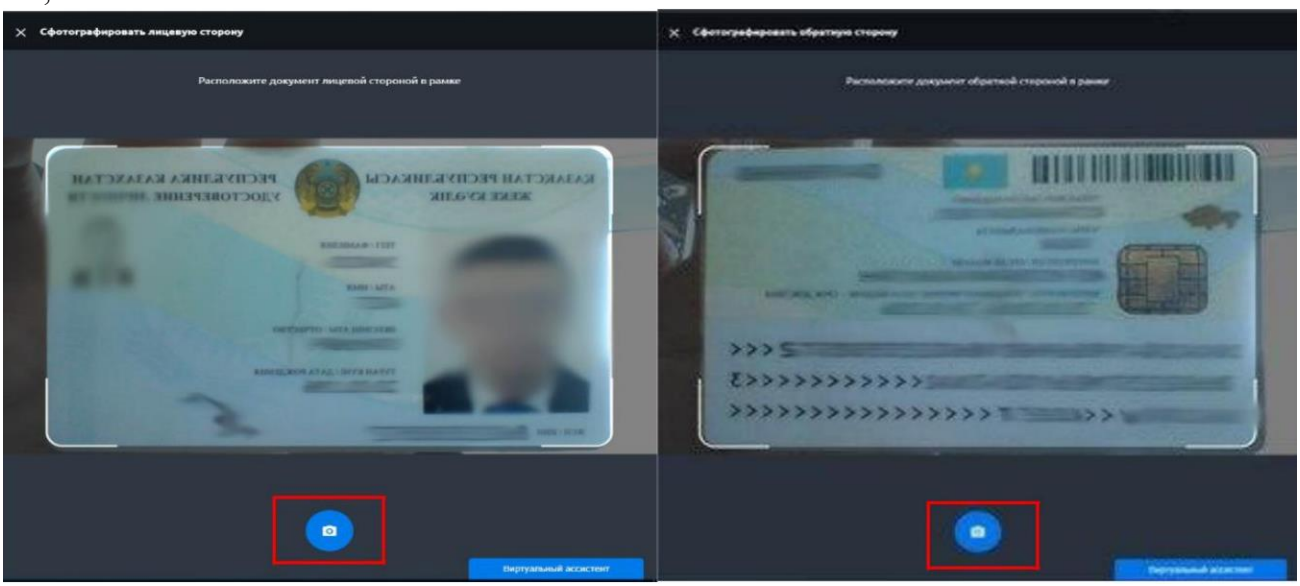
Then add an identification document by making photograph of it or by downloading it as a file.



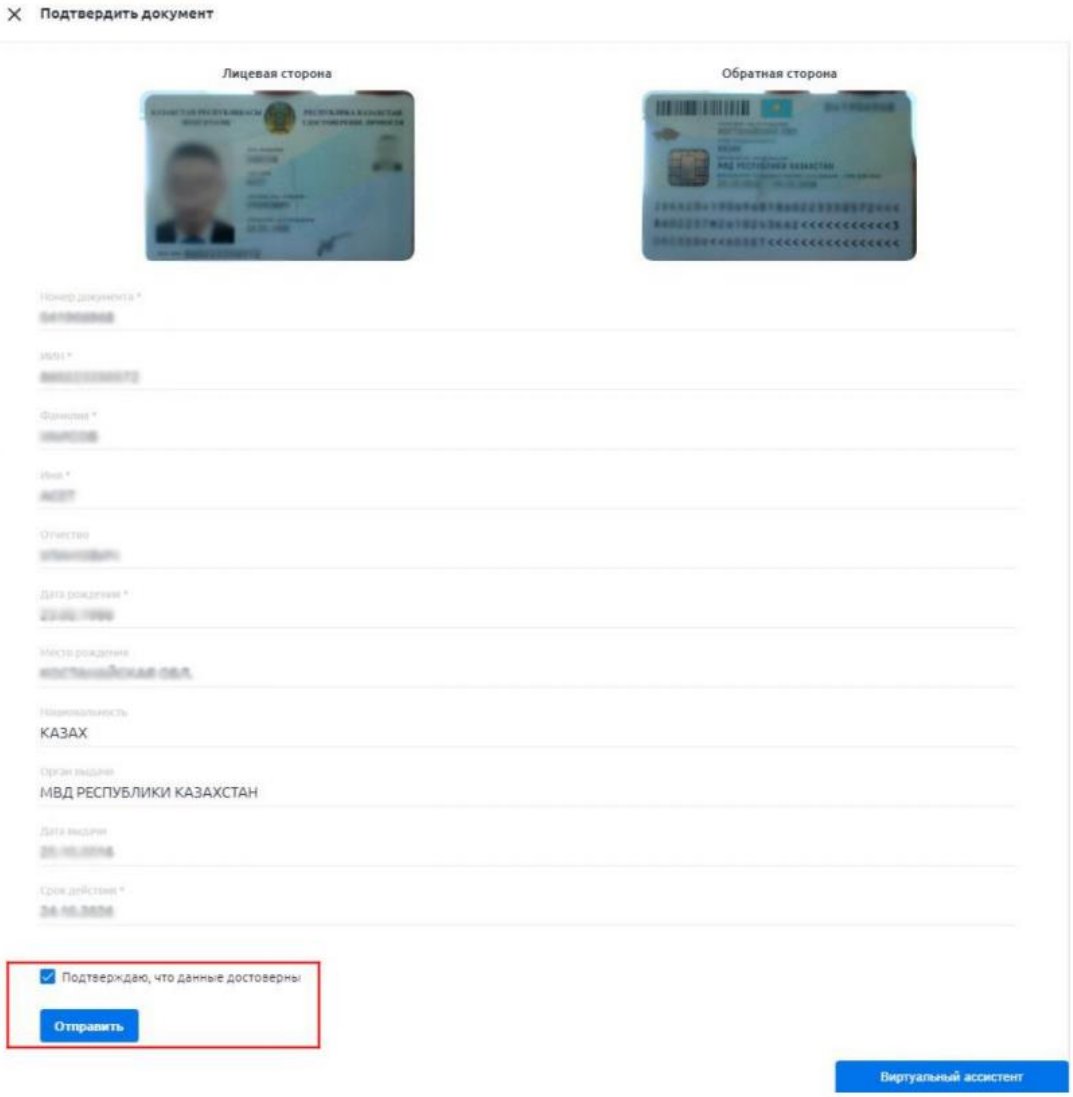
15. If you select "Make a photo" function, then you need to click "Start" button and make photograph from both sides separately.



16. Locate a front side of your document and then reverse side to fit in a frame and click photo icon, then click "Send" button.

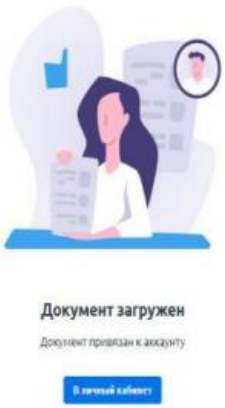


17. After you saved photographs, you need to check and verify recognized data from national ID and click "Send" button.

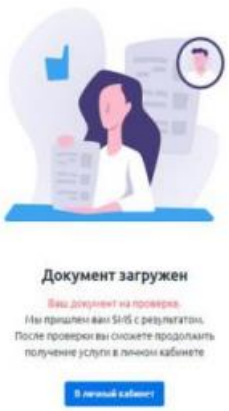


18. The system will check whether your selfie and data from national ID correspond to data from the national database of individuals:

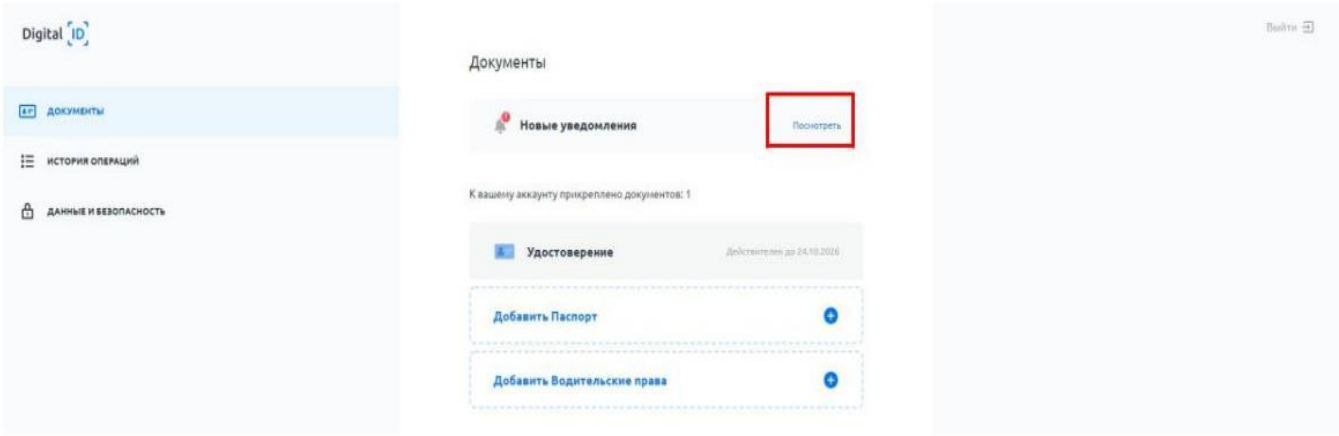
*If check is successful, a window will appear to access personal account.



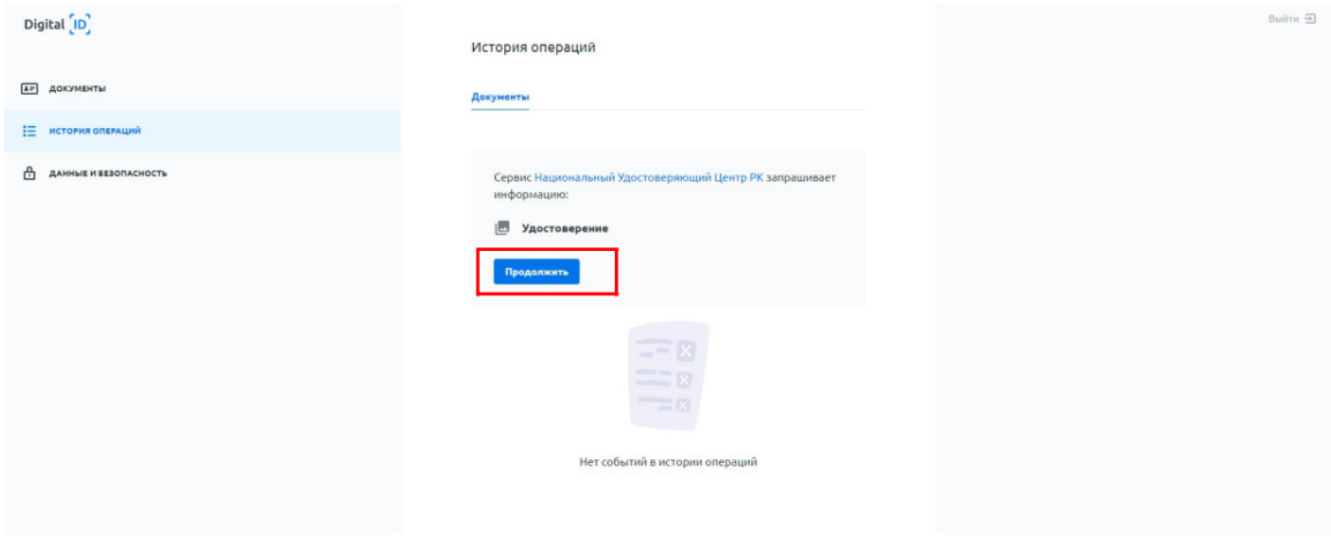
*In case if data won`t correspond then a window will appear with notificaion that your document is sent to an operator for check (moderation).



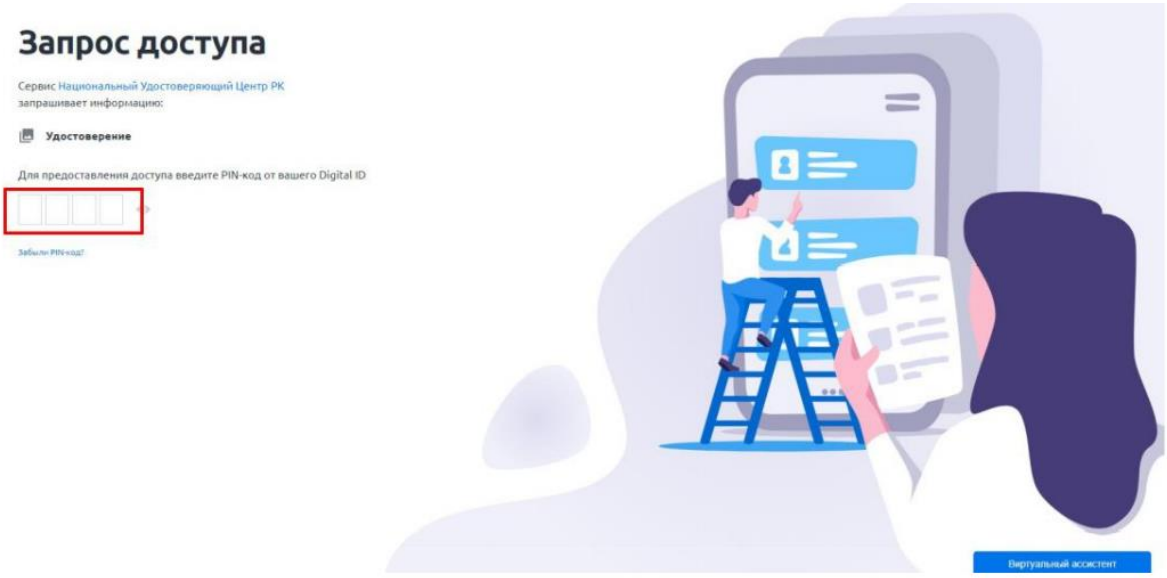
19. After a document is checked you will receive an SMS notification. In "Documents" section or on https://did.gov.kz/documents webpage you need to open a notification by clicking "View" button.



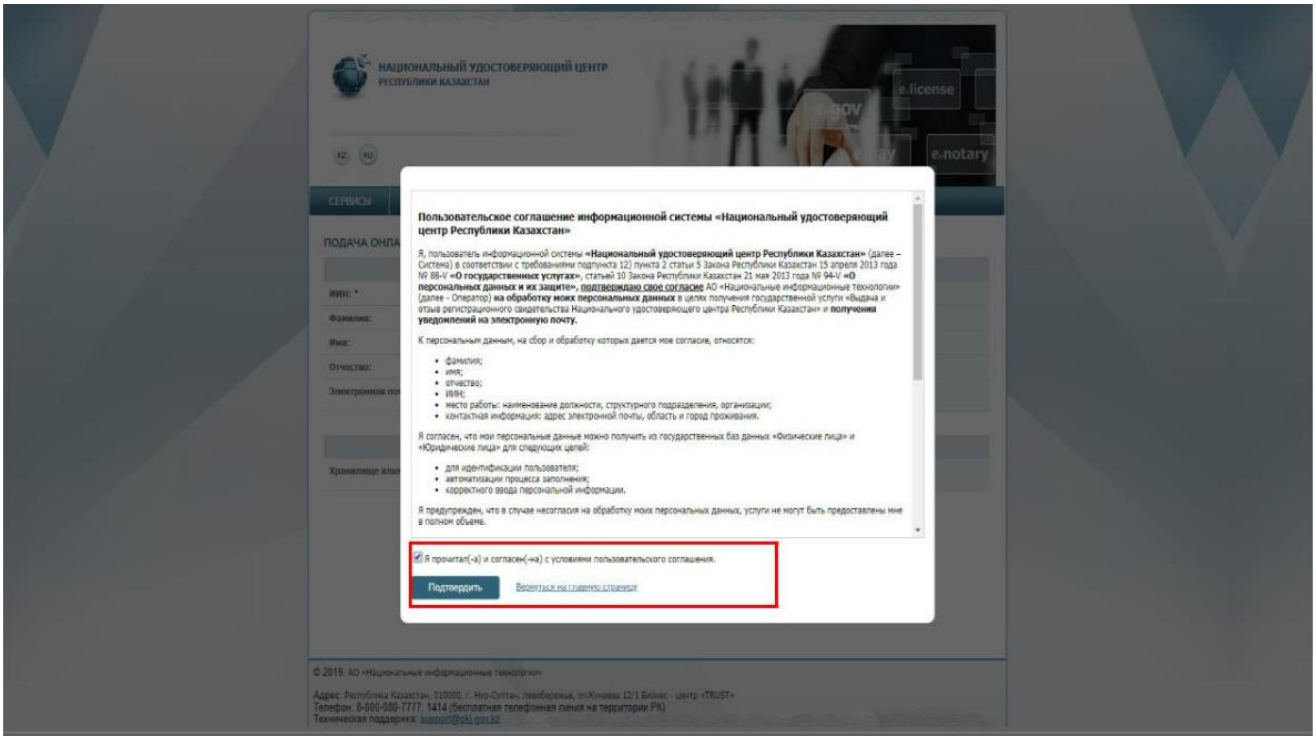
20. The system will request access to your data and national ID to transfer it to NCA of RoK service and generate request for obtainment of digital sifgmature keys. Click "Continue" button to continue.



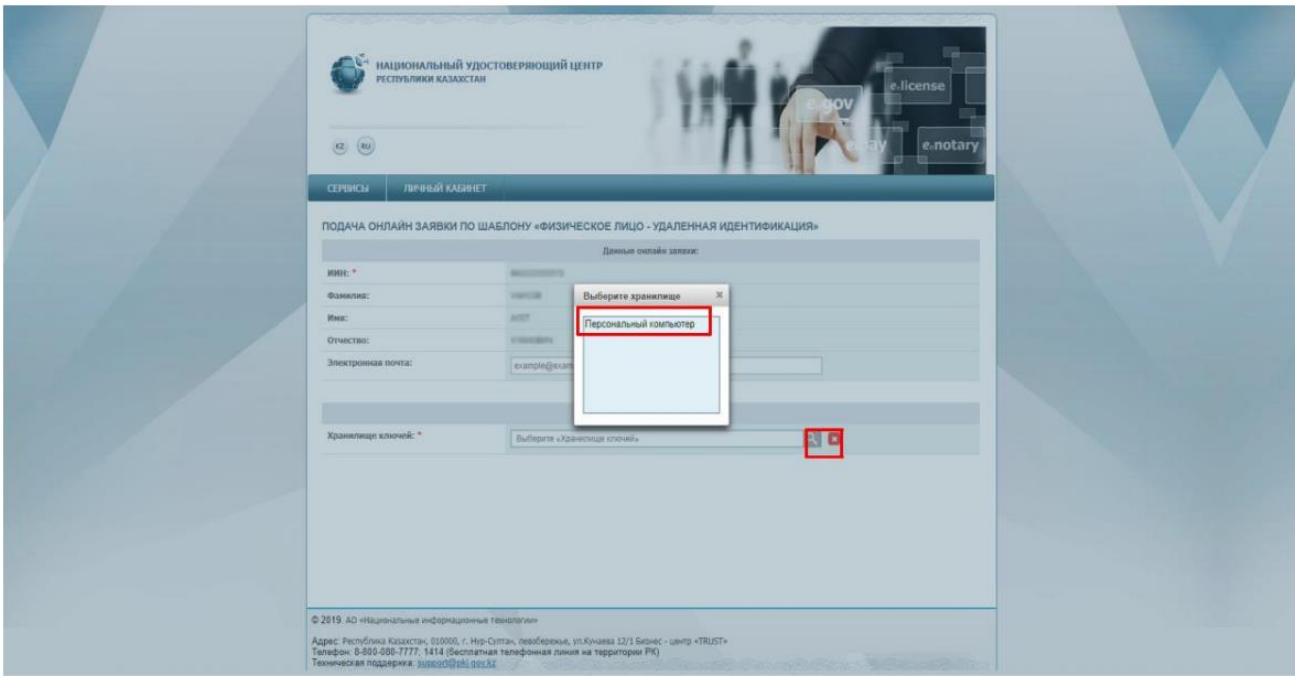
21. Then, fill in a PIN-code set earlier.



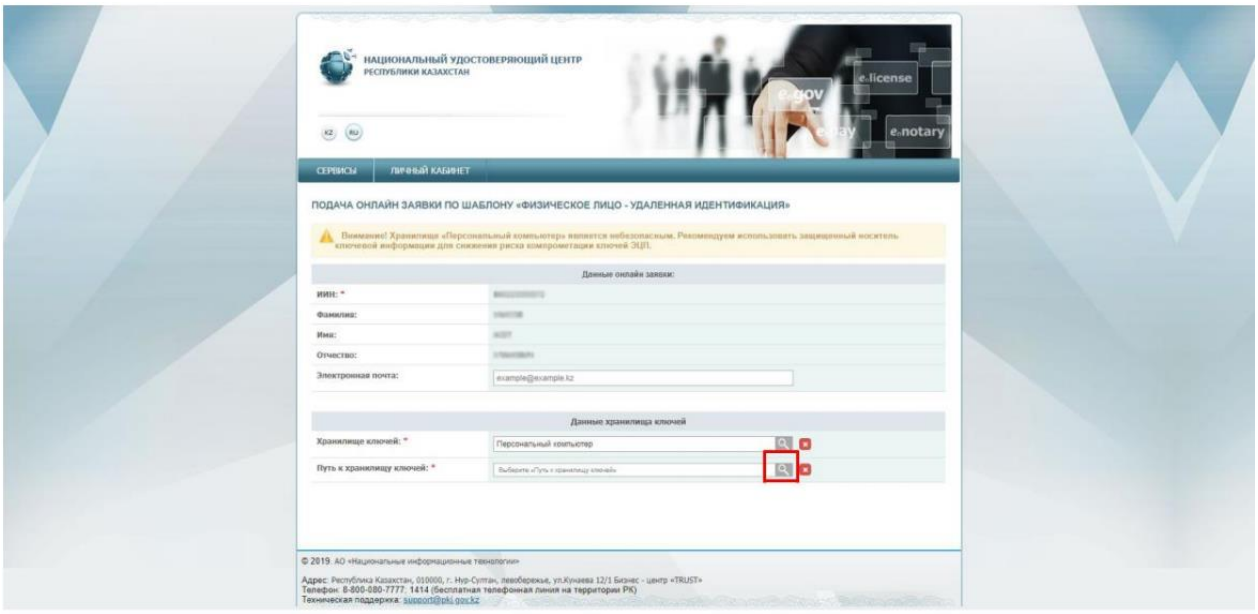
22. The NCA of RoK page will open. Familiarize with User Agreement and click "Verify" button.

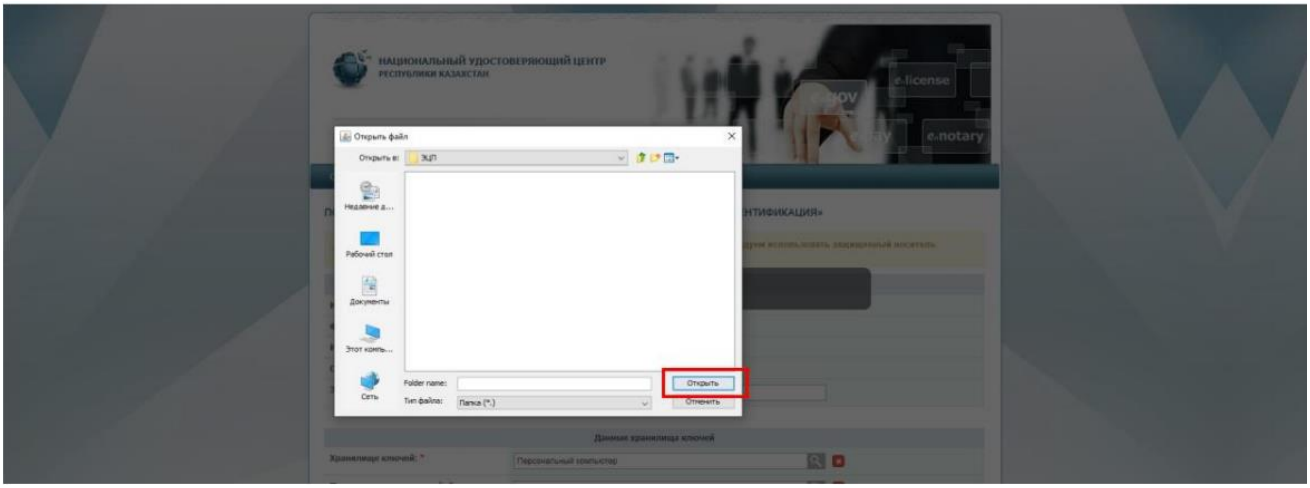


23. On application form you can indicate your e-mail for further obtainment of notifications regarding the status of digital sifgnature keys. When selecting a storage type for keys select "Personal computer".

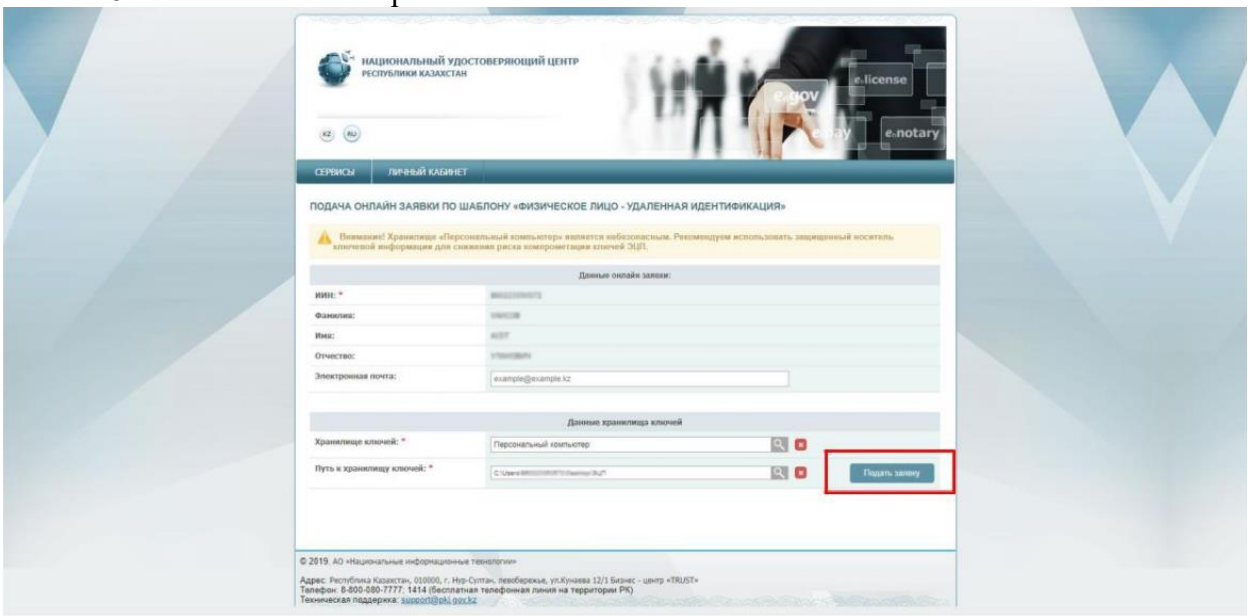


24. Then indicate a path to keys storage so that digital signature keys can be saved (select folder) and click "Open" button.

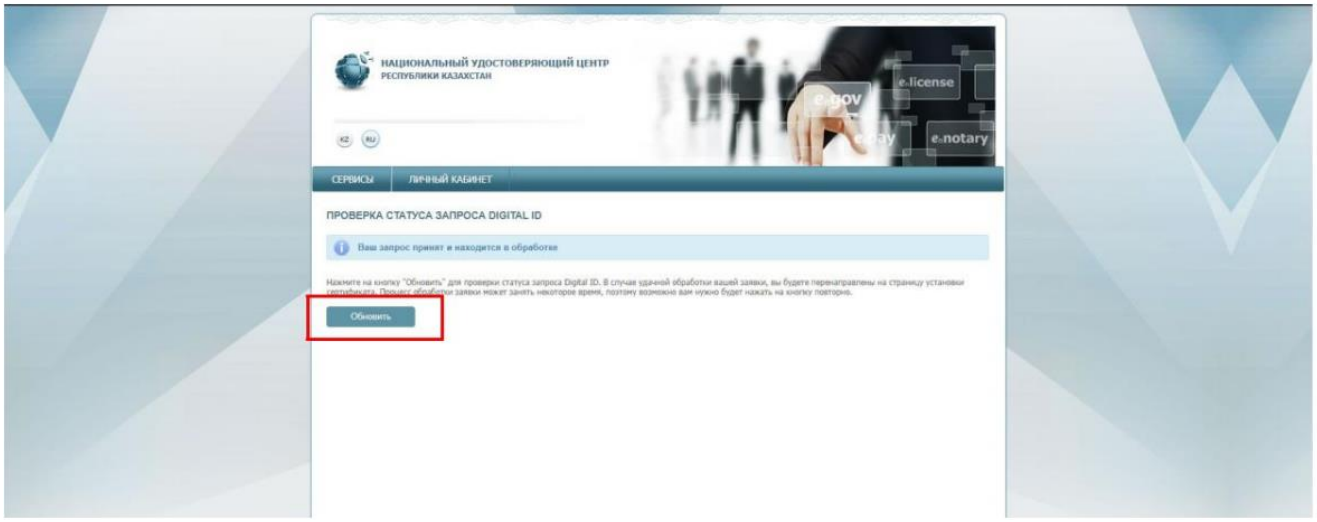




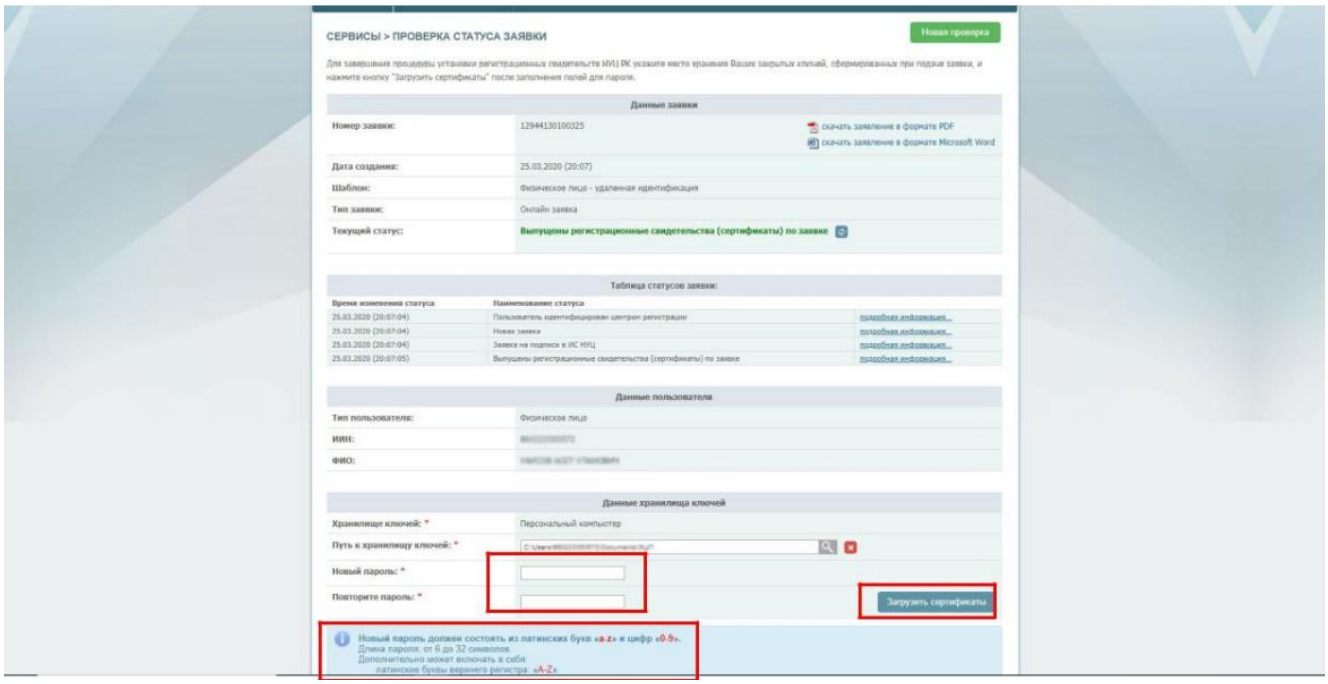
25. Click "Submit a request" button.



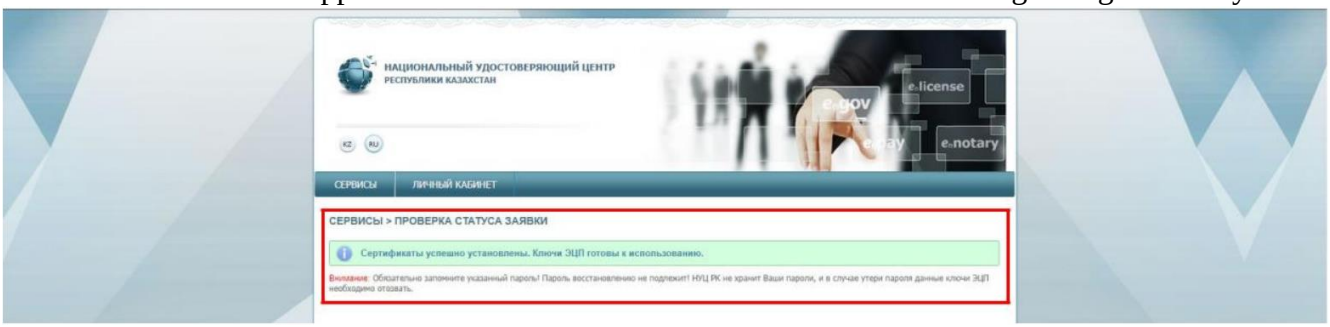
26. Click "Refresh" button.



27. Create and fill in a password for digital signature keys that would correspond to rrquire,ents and click "Download certificates" button.



28. A window will appear with notification on successful obtainment of digital signature keys.



The procedure of digital signature keys obtainment has been completed. Digital signature keys are saved to a folder which you indicated in step 24.

Take some screenshots that illustrate your work and identify you. Insert them into the MS Word document.

1. You have to obtain a certificate from anti-tuberculosis organization. (10)

2. You have to obtain a certificate from a narcological organization. (10)
3. You have to obtain a certificate from a neuropsychiatric organization. (10)
4. You have to obtain a certificate on existence or absence of conviction record. (10)
5. You have to check your tax debt. (10)

Add screenshots of certificates to the MS Word document and send via Platonus.

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: computer based teaching

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task

7. References

1. June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2014.
2. Shynybekov D.A. and others. Information and communication technology. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p. (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
3. Vijay K. Vaishnavi. Design Science Research Methods and Patterns: Innovating Information and Communication Technology, 2nd Edition 2015 by CRC Press
4. Hans J Schnoll E-Government: Information, Technology, and Transformation: Information, Technology, and Transformation (Routledge, March 12, 2015 - Political Science - 343 p.)
5. The Millennium Development Goals Report 2015, United Nations, New York, 2015

8.Control questions

1. What is e-government?
2. What important stages can be identified in the creation and development of the electronic government of the Republic of Kazakhstan?
3. What online services you can obtain on the egov.kz website?

Class 11

1. The theme: Introduction to artificial intelligence. The basic concepts of Artificial Intelligence. AI in the field of medicine

2. The goal: to familiarize medical students with the basic concepts of artificial intelligence (AI) and the study of its application in the field of medicine.

To introduce students to the basic concepts and history of artificial intelligence.

- To review the main areas of application of AI.
- Discuss the current achievements and prospects of AI development.
- To give a basic understanding of AI algorithms and methods.

3. The learning outcomes: after studying this class, the student will:

-Understanding AI Concepts, understand the key milestones in the history of AI development.
-Introduce medical students to AI concepts and terminology.
- know; Explore practical applications of AI in medicine.
- determine the performance;
- be able to. Provide hands-on experience with AI tools and techniques relevant to healthcare.
-Compare and contrast artificial intelligence systems and the human brain.

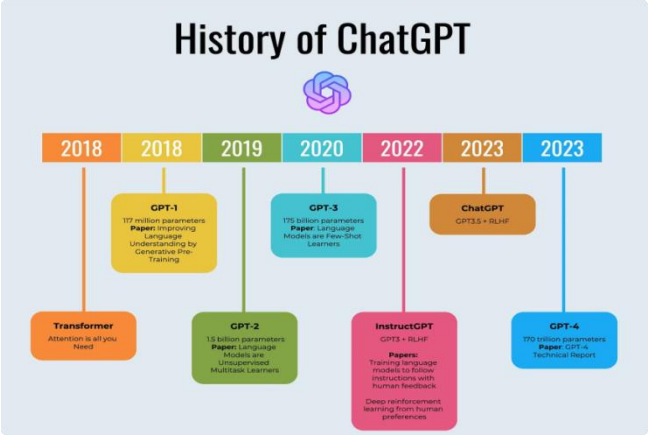
areas of AI:

- Machine learning
- Neural networks
- Natural language processing
- Computer vision

4. Main questions of the topic:

1. What is the primary goal of Artificial Intelligence (AI)?

2. Which of the following best describes Machine Learning?
3. Which of the following is a common application of AI in the medical field?
4. What distinguishes Deep Learning from other types of Machine Learning?*



Theory

The first mention of "artificial intelligence", as most people know, was made in 1955 by John McCarthy at a conference at Dartmouth. In the same year, Carnegie Mellon engineers Allen Newell, J.C. Shaw and Herbert Simon demonstrated the first working artificial intelligence program, Logic Theorist. By 1964, Dr. Danny Bobrow had proven the computer's ability to understand natural language and solve verbal algebra problems, and in 1965, Joseph Weizenbaum introduced ELIZA, an artificial intelligence program that conducts conversations in English on any topic.Over the following decades, advances in machine learning and natural language processing steadily progressed and began to find applications in the real world.

What is artificial intelligence and why is it important in 2024?

What is artificial intelligence: types, history and future

Previous

content

What is artificial intelligence?Weak AI versus strong AI - varieties of artificial intelligence, deep learning versus machine learning How does artificial intelligence work?More detailed

Artificial intelligence (AI) is currently one of the most popular buzzwords in the field of technology, and for good reason. Over the past few years, a number of innovations and achievements that were previously exclusively from the field of science fiction have gradually turned into reality.

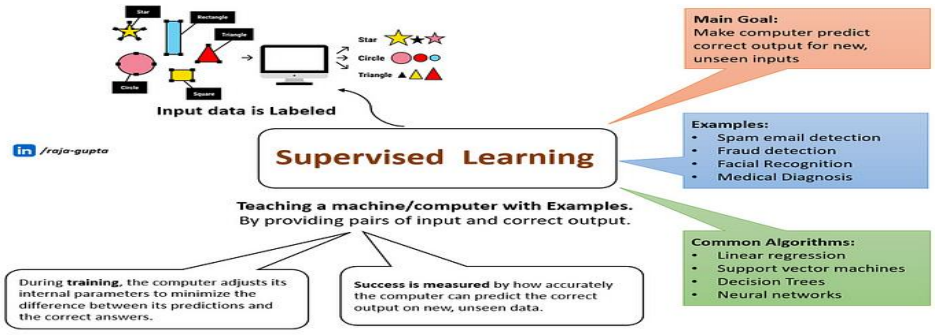
Experts consider artificial intelligence as a factor of production, which can potentially provide new sources of growth and change working methods in various industries. For example, in this PWC article, it is predicted that by 2035 AI could potentially bring global

Machine learning

How is the computer trained?

One of the approaches to AI that we use is called "machine learning". In a nutshell, machine learning "allows computers to learn without explicit programming. In the analysis, the technology uses algorithms that learn from the data and, in turn, evolve and change as new information is received, ultimately revealing these crucial ideas."

In today's rapidly evolving medical landscape, Artificial Intelligence (AI) is emerging as a significant catalyst for change. For medical students, physicians, and healthcare professionals alike, grasping the integration of AI into medical education and practice has become crucial. Drawing on insights from my conversations with Shiv Gaglani, CEO of Osmosis, and Dr Avneesh Khare, AI expert, this blog post aims to illuminate the transformative potential of AI. We'll provide specific AI prompts that can enhance your medical education and clinical practice, enabling you to navigate the future of healthcare confidently.



The ripple effect of AI's influence in medicine extends well beyond the confines of research laboratories and clinical settings. It's triggering a change in medical education, offering personalized learning experiences and bolstering clinical decision-making capabilities.

"The applications of AI in medicine are just so vast that it's going to be a requirement for every single health professional to have some basic understanding of AI and data science." — Shiv Gaglani

Tasks

Task 1: Chronology of the stages of AI development*

- Provide a chronology template starting from the 1950s to the present.
- I will ask you to study and describe significant events in the history of artificial intelligence (for example, the Turing test, the development of neural networks, Deep Blue vs. Kasparov).
- I suggest that you include brief descriptions or consequences of each milestone.
- *Result:* A detailed chronology illustrating the evolution of artificial intelligence and its main achievements.

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Источник: https://disshelp.ru/blog/15-poleznyh-sajtov-dlya-studentov-meditsinskih-universitetov/

Что даёт медицинское образование человеку, который её получил?

Что нужно приобрести первокурснику при поступлении ?

Медицинская учёба конечно же не без практики. Интересно ли она проходит? Можешь привести в пример историю?

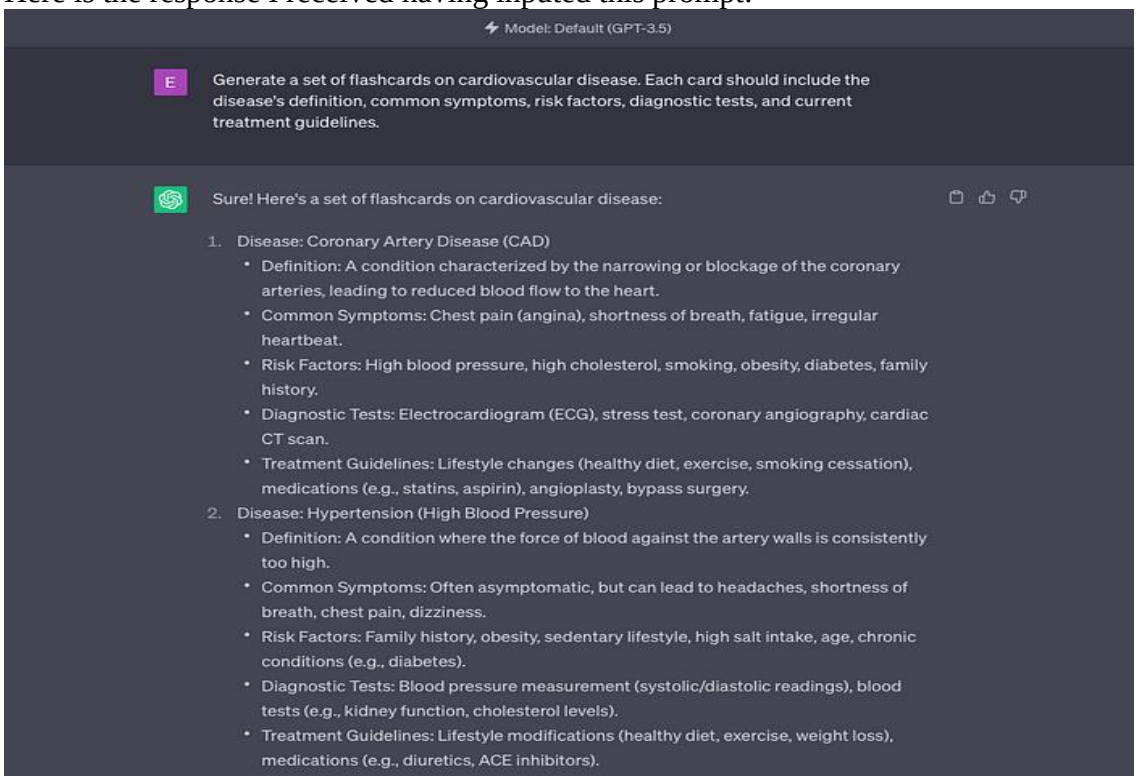
Какие сайты будут также полезны для студентов-медиков?

Статистические показатели по заболеваемости, лечению, частоте применения тех или иных инструкций, медикаментов, вакцин и пр.; Сведения о мерах профилактики заболеваний: вакцинация, иммунизация организма и пр.; Справочная информация по актуальным темам и вопросам в сфере здравоохранения; Клинические обзоры и результаты клинических испытаний новейших аппаратов и препаратов; Стандарты и инструкции, рекомендации по лечению заболеваний и проведению операций; Обзор новейших правил, принципов и методов работы медиков в самых разных ситуациях; Обзоры и новостные статьи о последних событиях в медицинской среде по стране и миру и пр.

Источник: https://disshelp.ru/blog/15-poleznyh-sajtov-dlya-studentov-meditsinskih-universitetov/

Task 2: Artificial Intelligence and the Human Brain
- Divide students into small groups.
- Provide reading materials or video recordings about the structure and functions of the human brain.
- To conduct research on how artificial intelligence systems (for example, neural networks) try to mimic brain functions.
- Discuss the similarities, differences and limitations between AI and human cognitive abilities.
- * Result:* Group presentations highlighting the relationship between artificial intelligence technology and neuroscience.

Task 3: "Generate a set of flashcards on (insert medical topic). Each card should include the disease's definition, common symptoms, risk factors, diagnostic tests, and current treatment guidelines."
Here is the response I received having inputed this prompt:



Here is an example template of a GOOD prompt which I created for my medical school revision using my intended learning objectives (feel free to copy and paste to try yourself):
"As a final year medical student, you are preparing for your imminent exams, and revision is essential. To aid your studies, generate 50 Anki-style flashcards covering (insert topic). These flashcards will serve as a comprehensive review tool to test your knowledge and understanding. Each flashcard should be designed in a question-and-answer format, focusing on specific areas of medical knowledge.
The flashcards should address the following aspects for each medical topic during your revision:

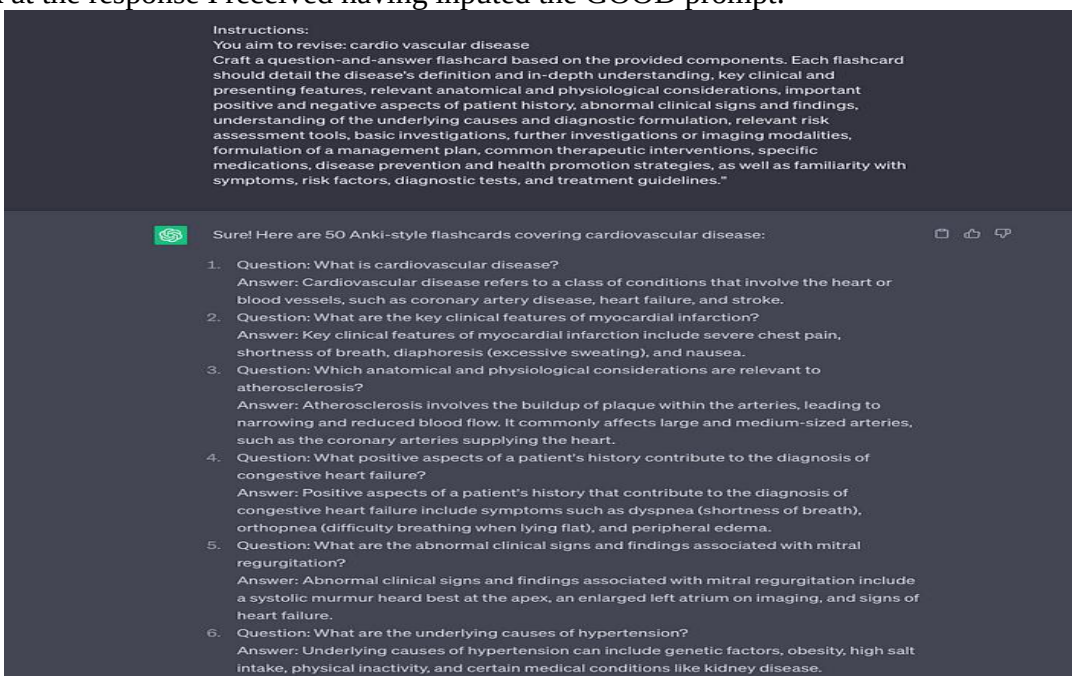
- Definition and in-depth understanding of the disease or condition
- Key clinical and presenting features characteristic of the condition
- Relevant anatomical and physiological considerations related to the condition
- Important positive and negative aspects of the patient's history that contribute to the diagnosis
- Abnormal clinical signs and findings associated with the condition
- Understanding the underlying causes and their role in formulating a diagnosis
- Application of risk assessment tools to evaluate the risk of disease development or complications
- Knowledge of relevant basic investigations and the ability to interpret their results
- Identification of the most appropriate further investigations or imaging modalities
- Formulation of a comprehensive management plan, including emergency measures if applicable
- Description of common therapeutic interventions, both pharmacological and non-pharmacological

- Understanding of specific medications, their routes of administration, mechanisms of action, and common side effects
- Awareness of disease prevention and health promotion strategies
- Familiarity with common symptoms, risk factors, diagnostic tests, and current treatment guidelines in the UK

Task 4: You aim to revise: (insert medical topic).

Craft a question-and-answer flashcard based on the provided components. Each flashcard should detail the disease's definition and in-depth understanding, key clinical and presenting features, relevant anatomical and physiological considerations, important positive and negative aspects of patient history, abnormal clinical signs and findings, understanding of the underlying causes and diagnostic formulation, relevant risk assessment tools, basic investigations, further investigations or imaging modalities, formulation of a management plan, common therapeutic interventions, specific medications, disease prevention and health promotion strategies, as well as familiarity with symptoms, risk factors, diagnostic tests, and treatment guidelines."

Now look at the response I received having inputed the GOOD prompt:



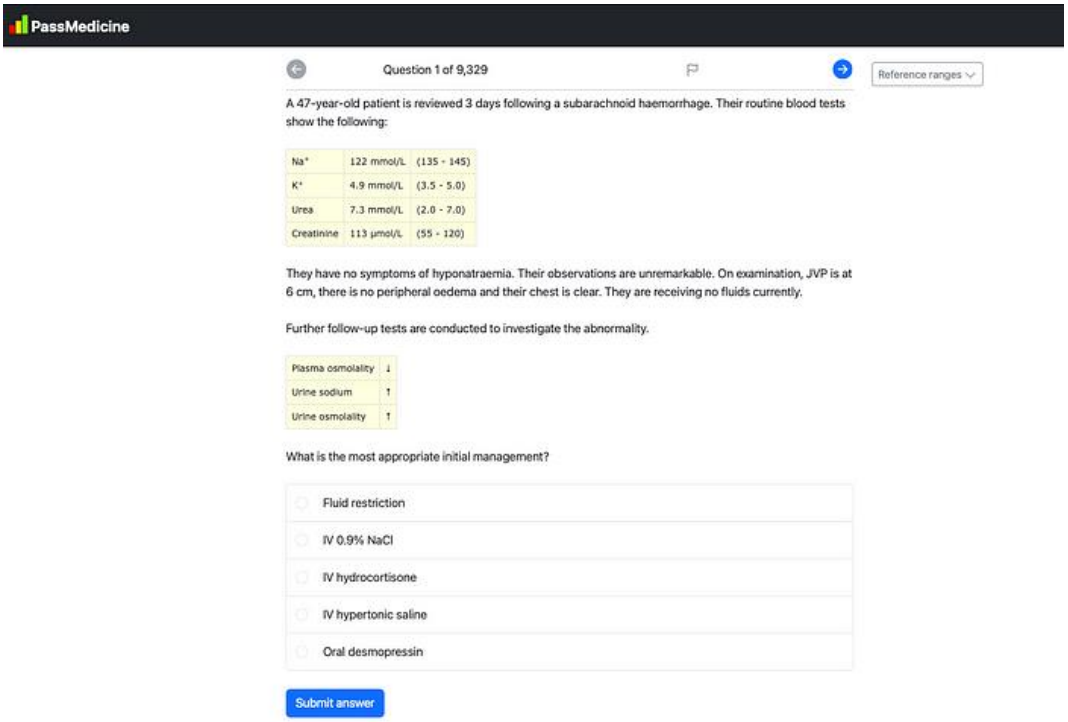
This prompt exemplifies the depth and specificity achievable with AI. It's comprehensive, covering a broad range of patient care components. It demonstrates the AI's versatility in meeting your unique learning objectives and the depth of knowledge it can encapsulate.

With such a detailed prompt, the AI doesn't merely provide facts; it curates targeted information, helping you focus on what's most important. It allows the creation of flashcards that not only centre on disease-specific knowledge but also highlight the full scope of patient care — from disease prevention strategies to management plans, from basic investigations to risk assessment tools.

Such a detailed prompt also serves as a guide for other medical students and doctors aiming to replicate this method. The primary takeaway here is to be as specific as possible with your prompt. Clearly identify your learning objectives, specify the style of flashcards you prefer, and articulate the topics you want the flashcards to cover.

Task 5: Creating Exam-Style Questions ❓

Questions stimulate critical thinking and enhance memory recall. This is due to the phenomenon that when we anticipate the need to teach or explain something to others, we tend to learn more effectively. Question banks like Passmed and Quesmed only have a limited number of questions per topic. I created this prompt so I could have an UNLIMITED question bank without having to pay for more subscription services.



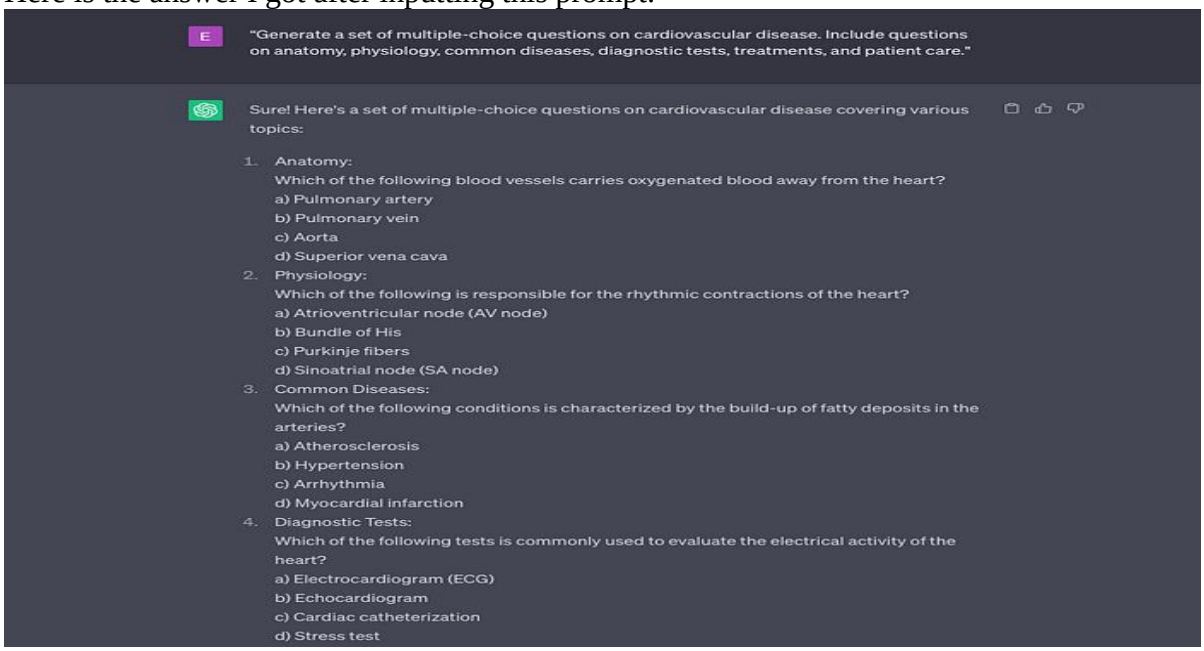
Example of SBA exam style question form medical question bank "passmedicine"

An AI, like ChatGPT, can generate a diverse set of questions, tailored to your learning needs, thereby enhancing your understanding and retention of knowledge. This method not only solidifies your grasp on the material but also ensures you are well-prepared to apply the knowledge in a clinical setting or an examination.

Here is another example of a BAD prompt which is generic and not very specific:

"Generate a set of multiple-choice questions on (insert topic). Include questions on anatomy, physiology, common diseases, diagnostic tests, treatments, and patient care."

Here is the answer I got after inputting this prompt:



Despite these generated questions still serving as good revision, the questions are very different to the Single Best Answer (SBA) style questions we see in medical school exams.

Here is an example template of a GOOD prompt which I created to have an unlimited SBA style question bank (feel free to copy and paste to try yourself):

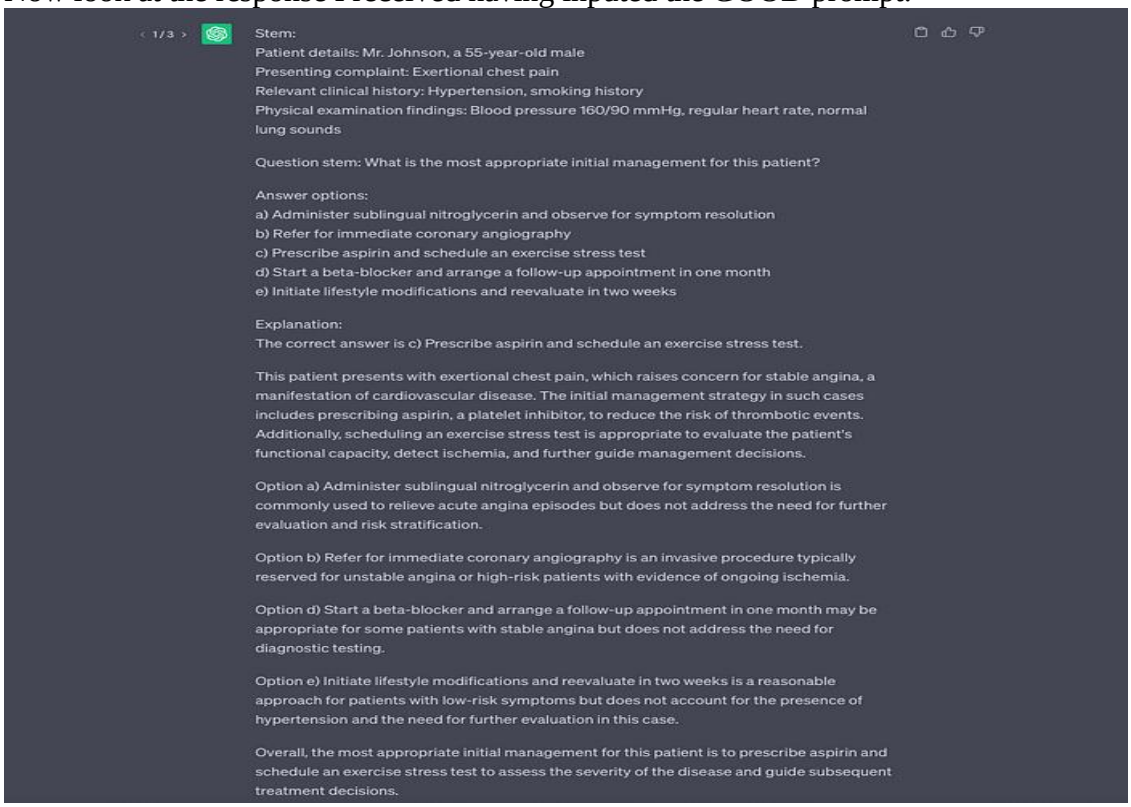
"You are developing a question bank for medical exams focusing on the topic of [insert topic]. Generate a high-quality Single Best Answer (SBA) question using the following framework:
Stem:

1. Patient details (gender/age)
2. Presenting complaint (PC)
3. Relevant clinical history (HPC)
4. Physical examination findings
5. Diagnostic test results (optional)

Question stem: [Insert relevant information from the above sections]
Acceptable question style: Ask for the BEST answer, NOT one that is TRUE/FALSE, for example:
Answer options:

1. [Insert plausible answer option]
2. [Insert plausible answer option]
3. [Insert plausible answer option]
4. [Insert plausible answer option]
5. [Insert plausible answer option]

Explanation:
• Identify and explain the correct answer.
• Explain why this is the most appropriate answer based on evidence-based guidelines or expert consensus.
• Briefly explain why the other answer options are less correct or incorrect.
Difficulty level: [Insert difficulty level (e.g., easy, moderate, difficult)]
Using this framework, medical students can generate a variety of high-quality SBA questions for their medical exams by replacing the relevant information in the stem and answer options. Ensure that the questions are focused, relevant, and effectively test the candidate's knowledge."
Now look at the response I received having inputed the GOOD prompt:



This prompting framework is designed to generate comprehensive, targeted SBA questions for your medical exams. You can adjust the topic, stem, and answer options according to your specific learning

needs. It guides the AI to understand the style and format of the question you want to create. The AI then utilizes this information to generate a question that is focused, relevant, and effective in testing your knowledge.

The significance of creating high-quality questions cannot be overstated. Not only do they push you to remember, understand, and apply what you've learned, but they also mimic the style of medical school examinations, preparing you for the real thing. This is an active learning approach, which is proven to be more effective than passive learning methods.

By using this prompt, you are guiding the AI to create a question bank that aligns with your learning objectives, helping you to be more effective and efficient in your studies.

3. Teaching methods/technology:

Teaching methods:

- by external signs of the activity of the teacher and students: *story, demonstration, instruction;*
- according to the degree of activity of students' cognitive activity*: problem-based, partially search, illustrative, explanatory.*

Teaching technology:

- computer training.

6. Assessment methods/technology:

Individual student report made in MS Word in electronic format.

Report Contents

1. Results of solving task 1 (using the MS Word Formula Editor tool to design formulas and calculations) [6].
2. Results of completed work (screenshots), description of actions and conclusions for task 2.
3. Results of analysis (+ screenshots).
4. Answers to control questions.

7. References

1. *Books:* "Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again" by Eric Topol.
2. *Online Courses:* Coursera's "AI for Medicine," edX's "AI in Healthcare."
3. *Websites:* Towards Data Science, Medium, AI-related blogs focused on healthcare.

8. Control questions:

Multiple-Choice Questions: Introduction to AI

1. What is the primary goal of Artificial Intelligence (AI)?

- A) To create systems that can perform tasks requiring human intelligence.
- B) To develop hardware that can mimic human physical activities.
- C) To simulate natural phenomena using computers.
- D) To replace all human jobs with machines.

2. Which of the following best describes Machine Learning?

- A) Machines programmed to perform specific tasks without variation.
- B) A subset of AI that involves machines improving their performance based on data.
- C) The creation of machines that can perform physical labor.
- D) The study of algorithms that replicate human cognition.

3. What distinguishes Deep Learning from other types of Machine Learning?

- A) Its use of linear regression models.
- B) Its use of hierarchical neural networks.
- C) Its focus on clustering and classification without supervision.
- D) Its reliance on simple, flat data structures.

4. Which of the following is a common application of AI in the medical field?

- A) Automated scheduling of medical staff.
- B) Using AI to diagnose diseases from medical imaging.
- C) Developing new pharmaceutical compounds.

- D) Performing surgical procedures independently.

5. What is Natural Language Processing (NLP) in the context of AI?
- A) A method for machines to understand and generate human language.
- B) A technique to process natural resources using AI.
- C) A form of AI that deals with physical movement and robotics.
- D) An approach to AI that focuses on visual data interpretation.

6. In which area has AI shown significant potential for improving patient care?
- A) Real-time monitoring of patient vitals.
- B) Processing insurance claims.
- C) Managing hospital logistics.
- D) Automating pharmaceutical sales.

7. What is the main function of an algorithm in AI?
- A) To store data in databases.
- B) To provide a step-by-step procedure for solving a problem or performing a task.
- C) To manufacture hardware components.
- D) To perform data entry tasks.

8. How does supervised learning differ from unsupervised learning?
A) Supervised learning uses labeled data for training, while unsupervised learning uses unlabeled data.
B) Supervised learning involves clustering data, while unsupervised learning focuses on regression.
C) Supervised learning is used only for image processing, while unsupervised learning is used for text.
D) There is no significant difference between the two.

9. Which Python library is specifically designed for building and training neural networks?
- A) pandas
- B) scikit-learn
- C) TensorFlow
- D) matplotlib

10. What is one of the primary ethical concerns regarding the use of AI in healthcare?
- A) AI systems will always make accurate decisions.
- B) AI systems might lead to the loss of personal patient data.
- C) AI will increase the workload of healthcare professionals.
- D) AI can replace all medical professionals.

These questions are intended to test students' understanding of fundamental AI concepts and their implications in the medical field.

Class 12

4. **The theme:** Development of structure and the maintenance of a lesson in the environment of remote learning
5. **The goal:** The aim of this lesson is to introduce students to the concept of e-learning, the advantages and disadvantages of e-learning, and the opportunities they can implement on educational platforms.
6. **The learning objective:** Having studied this lesson the student will be able to:
   - understand the basic concepts of e-learning;
   - list several educational platforms that may be useful for self-education;
   - register on the educational platform;
   - create word clouds using an online service.

4. Key questions of the theme:

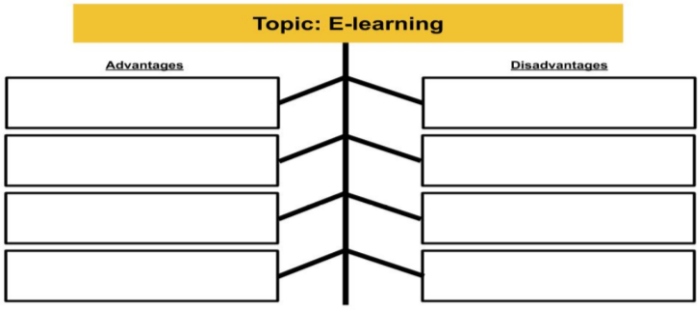
1. What is e-learning explain with example?
2. What are the types of e-learning?
3. What are the advantages and disadvantages of e-learning?

4. What are some e-learning tools?
5. What educational platforms do you know?

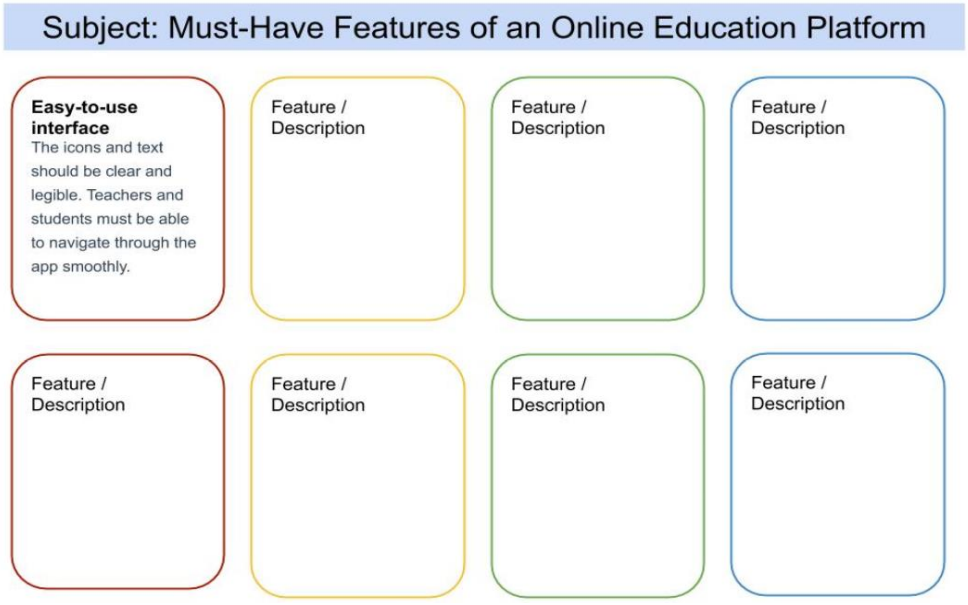
Tasks

2.Create an "E-learning" word cloud using an online word cloud art creator https://wordart.com/.
Take a screenshot of the word cloud, save as an image and send to Platonus. (10-20)

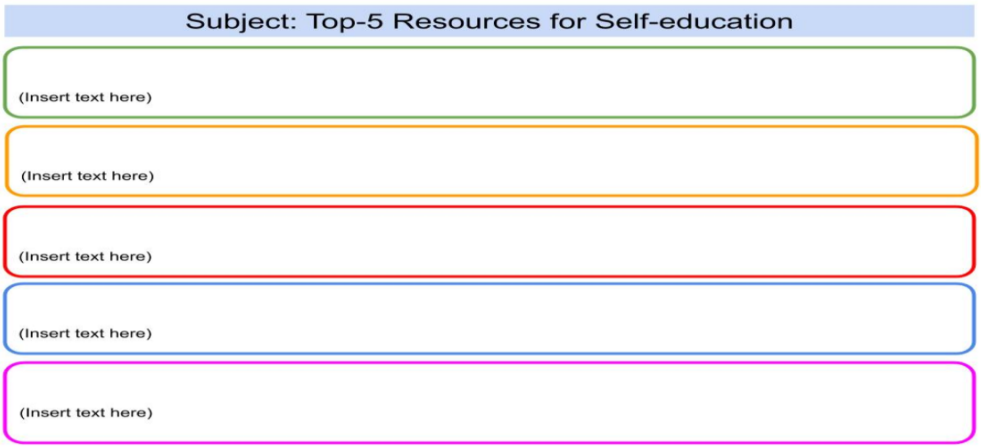
3.List the advantages and disadvantages of a "E-learning" using fishbone diagram. (10-20)



4. List the Must-Have Features of an Online Educational platform and give a brief description. The first block is filled in as a sample. (10-20)



5.Find information about TOP-5 Resources for Self-education, which would contain courses in Medicine and Pharmacy. Give them a brief description. (10-20)



6. Using the link
Coursera | Build Skills with Online Courses from Top Institutions
go to the Coursera educational platform, register, choose a free course that you like, start learning. Using the Bandicam screen capture software create an educational video about this platform. Record sound, add webcam overlay, academy logo and mouse pointer. Create your own YouTube channel, export completed videos and share links with teacher. (10-20)
(Instruction here https://www.bandicam.com/support/settings/video/)
7. Take part in the distance learning survey for students by following the link
https://docs.google.com/forms/d/e/1FAIpQLSe9cLQgmZgEBiahhz4Po3zUHuojih69k56ZOY7lCbkSRmX0aQ/viewform?usp=sf_link

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: discussion.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.

7. References

1. June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2014.
2. Shynybekov D.A. and others. Information and communication technology. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p. (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)
3. Vijay K. Vaishnavi. Design Science Research Methods and Patterns: Innovating Information and Communication Technology, 2nd Edition 2015 by CRC Press
4. Hans J Schnoll E-Government: Information, Technology, and Transformation: Information, Technology, and Transformation (Routledge, March 12, 2015 - Political Science - 343 p.) The Millennium Development Goals Report 2015, United Nations, New York, 2015

8.Control questions

1. List the advantages and disadvantages of a "E-learning".
2. List the Must-Have Features of an Online Educational platform.
3. List some e-learning tools.
4. Describe TOP-5 Resources for Self-education

Class 13

1. The theme: Visualization of medical data using artificial intelligence

2. The goal: to familiarize medical students Data visualization methods using AI and the study of its application in the field of medicine.

3. The learning outcomes: after studying this class, the student will:

- Understanding Data visualization methods using AI.
- Introduce medical students to methods using AI
- Know; AI-based tools
- Determine Data visualization methods using AI.
- Be able to. Creating interactive visualizations using AI-based tools. Kandinsky, Visper, Quiver e.t.c..

4. Main questions of the topic:

What are the five data visualization techniques?
What are the uses of data visualization?
What are the best data visualization tools for Data Scientists ?

Theory

Task 1: **Visualization of Medical Data Using Artificial Intelligence**

Objective:
To understand and apply artificial intelligence (AI) techniques for visualizing medical data, helping to enhance diagnostic capabilities and treatment planning.
Background:
Medical data visualization using AI involves transforming complex datasets into understandable visual formats, aiding in better decision-making in clinical settings. This exercise will focus on using machine learning techniques to visualize patient data, such as MRI images, and analyze trends in patient outcomes.
Materials Needed:
- Access to a computer with Python and relevant libraries installed (e.g., TensorFlow, Keras, PyTorch, scikit-learn, matplotlib, seaborn).
- Dataset (e.g., MRI images from an open-source database like the Alzheimer's Disease Neuroimaging Initiative (ADNI) or any anonymized patient data available through your institution).
Task:
1. *Data Preprocessing:*
   - Load the dataset.
   - Perform necessary preprocessing steps such as normalization, resizing images, or handling missing values.
2. *AI Model Training:*
   - Choose an AI model (e.g., Convolutional Neural Network (CNN) for image data).
   - Train the model on the dataset.
   - Evaluate the model's performance using metrics like accuracy, precision, recall, and F1 score.
3. *Visualization:*
   - Use visualization tools to display the training process (loss and accuracy curves).
   - Visualize the results on the test data. For example, overlay model predictions on MRI images to show areas of interest.
4. *Trend Analysis:*
   - If working with time-series or multi-dimensional data, use AI to identify and visualize trends. For example, use clustering techniques to group similar patient outcomes and visualize these clusters.
5. *Interpretation:*
   - Write a report interpreting the visualizations. Discuss how the visualizations could aid medical professionals in diagnosing conditions or planning treatments.
Steps:
1. *Data Preprocessing:*
   python
   import numpy as np
   import pandas as pd
   from sklearn.model_selection import train_test_split
   from sklearn.preprocessing import StandardScaler

```
import cv2
import os
# Load and preprocess dataset (example for image data)
def load_data(data_path):
    images = []
    labels = []
    for folder in os.listdir(data_path):
        label = folder
        for file in os.listdir(os.path.join(data_path, folder)):
            img = cv2.imread(os.path.join(data_path, folder, file), cv2.IMREAD_GRAYSCALE)
            img = cv2.resize(img, (128, 128))  # Resize to 128x128
            images.append(img)
            labels.append(label)
    images = np.array(images)
    labels = np.array(labels)
    return images, labels
data_path = 'path_to_your_dataset'
images, labels = load_data(data_path)
# Normalize and split data
images = images / 255.0  # Normalize pixel values
X_train, X_test, y_train, y_test = train_test_split(images, labels, test_size=0.2, random_state=42)
```

2. *AI Model Training:*

```
python
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense
model = Sequential([
    Conv2D(32, (3, 3), activation='relu', input_shape=(128, 128, 1)),
    MaxPooling2D((2, 2)),
    Conv2D(64, (3, 3), activation='relu'),
    MaxPooling2D((2, 2)),
    Flatten(),
    Dense(128, activation='relu'),
    Dense(1, activation='sigmoid')
])
model.compile(optimizer='adam', loss='binary_crossentropy', metrics=['accuracy'])
history = model.fit(X_train, y_train, epochs=10, validation_split=0.2)
```

3. *Visualization:*

```
python
import matplotlib.pyplot as plt
# Plot training history
plt.figure(figsize=(12, 4))
plt.subplot(1, 2, 1)
plt.plot(history.history['loss'], label='Loss')
plt.plot(history.history['val_loss'], label='Val Loss')
plt.legend()
plt.title('Training and Validation Loss')
plt.subplot(1, 2, 2)
plt.plot(history.history['accuracy'], label='Accuracy')
plt.plot(history.history['val_accuracy'], label='Val Accuracy')
```

```
plt.legend()
plt.title('Training and Validation Accuracy')
plt.show()
# Visualize model predictions
predictions = model.predict(X_test)
fig, axes = plt.subplots(1, 5, figsize=(20, 4))
for i in range(5):
    axes[i].imshow(X_test[i].reshape(128, 128), cmap='gray')
    axes[i].set_title(f"Predicted: {predictions[i]:.2f}")
    axes[i].axis('off')
plt.show()
```

4. *Trend Analysis:*

```
python
from sklearn.decomposition import PCA
import seaborn as sns
# Assuming `features` contains extracted features from a trained model
pca = PCA(n_components=2)
pca_result = pca.fit_transform(features)
df_pca = pd.DataFrame(data=pca_result, columns=['PC1', 'PC2'])
df_pca['label'] = labels
plt.figure(figsize=(10, 8))
sns.scatterplot(x='PC1', y='PC2', hue='label', data=df_pca)
plt.title('PCA of Medical Data')
plt.show()
```

5. *Interpretation:*

- *Report:* Summarize your findings, describe the model's performance, and explain how the visualizations can be used in a clinical setting. Discuss potential improvements and future applications.

Expected Outcomes:

- Students will gain hands-on experience with AI techniques in medical data visualization.
- They will understand the importance of preprocessing, model training, and interpretation of AI results in a medical context.
- The exercise will illustrate the potential of AI in improving diagnostic accuracy and aiding in clinical decision-making.

Task 2: Tasks for Students: Medical Data Visualization Using AI

Objective:

Students will explore and implement AI techniques to visualize medical data, enabling improved diagnostic capabilities and clinical decision-making.

Task 1: Data Preprocessing

1. *Data Collection:*
   - Collect a medical dataset (e.g., MRI images, patient records, or any available dataset).
   - Familiarize yourself with the data format and attributes.
2. *Data Cleaning:*
   - Handle missing values and outliers.
   - Normalize or standardize the data as necessary.
   - For image data, resize images to a standard size (e.g., 128x128 pixels).
3. *Data Splitting:*
   - Split the dataset into training and testing sets (e.g., 80% training, 20% testing).

Task 2: AI Model Training

1. *Model Selection:*
   - Choose an appropriate AI model based on the data type (e.g., CNN for images, LSTM for time-

series data).
2. *Model Implementation:*
- Implement the model using a deep learning framework (e.g., TensorFlow, Keras, PyTorch).
- Define the architecture, including layers, activation functions, and optimizer.
3. *Model Training:*
- Train the model on the training data.
- Monitor the training process and adjust hyperparameters as needed (e.g., learning rate, batch size).
Task 3: Visualization of Training Process
1. *Training Curves:*
- Plot training and validation loss curves.
- Plot training and validation accuracy curves.
2. *Analysis:*
- Analyze the training curves to identify overfitting, underfitting, or well-fitted models.
Task 4: Visualization of Predictions
1. *Prediction Visualization:*
- For image data, visualize a few sample predictions (e.g., overlay model predictions on MRI images).
- For structured data, visualize predictions versus actual values using scatter plots or other relevant plots.
2. *Error Analysis:*
- Identify and visualize instances where the model performed poorly.
- Discuss possible reasons for errors and suggest improvements.
Task 5: Trend Analysis and Insights
1. *Dimensionality Reduction:*
- Use techniques like PCA (Principal Component Analysis) or t-SNE (t-Distributed Stochastic Neighbor Embedding) to reduce the dimensionality of feature data.
- Visualize the reduced dimensions to identify patterns or clusters.
2. *Trend Visualization:*
- Visualize trends in patient data (e.g., disease progression, response to treatment) using line plots, heatmaps, or other appropriate methods.
3. *Clustering:*
- Apply clustering algorithms (e.g., K-means, hierarchical clustering) to group similar patient data.
- Visualize the clusters and interpret their clinical significance.
Task 6: Interpretation and Reporting
1. *Interpretation:*
- Write a detailed report interpreting the visualizations.
- Discuss how the visualizations can assist medical professionals in diagnosing conditions or planning treatments.
2. *Recommendations:*
- Provide recommendations for improving the AI model or the data visualization techniques.
- Suggest potential future applications of the work in clinical settings.
Deliverables:
1. *Code:*
- Well-documented code for data preprocessing, model training, and visualization.
2. *Visualizations:*
- Training and validation curves.
- Sample prediction visualizations.
- Dimensionality reduction and clustering visualizations.
- Trend analysis visualizations.

3. *Report:*
   - A comprehensive report detailing the process, findings, visualizations, and interpretations.
   - Discussion on the clinical relevance of the visualizations.
   - Recommendations for further improvements.

Grading Criteria:
- *Completeness:* All tasks are completed and all deliverables are submitted.
- *Accuracy:* The AI model is correctly implemented and performs reasonably well.
- *Quality of Visualizations:* Visualizations are clear, informative, and well-labeled.
- *Interpretation:* The report provides insightful interpretations and demonstrates an understanding of the clinical implications.
- *Code Quality:* Code is clean, well-documented, and follows best practices.

Task 5: **Teaching methods/technology:**

Teaching methods:
- by external signs of the activity of the teacher and students: *story, demonstration, instruction;*
- according to the degree of activity of students' cognitive activity*: problem-based, partially search, illustrative, explanatory*.

Teaching technology:
- computer training.

6. Assessment methods/technology:

Individual student report made in MS Word in electronic format.

Report Contents

1. Results of solving task 1 (using the MS Word Formula Editor tool to design formulas and calculations) [6].
2. Results of completed work (screenshots), description of actions and conclusions for task 2.
3. Results of analysis (+ screenshots).
4. Answers to control questions.

Teaching assessment checklist::

7. References

1. *Books:* "Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again" by Eric Topol.
2. *Online Courses:* Coursera's "AI for Medicine," edX's "AI in Healthcare."
3. *Websites:* Towards Data Science, Medium, AI-related blogs focused on healthcare.

8. Control questions:

Multiple-Choice Questions:

1. What are the five data visualization techniques?

Five data visualization techniques are:
- Bar Charts
- Line Charts
- Scatter Plots
- Pie Charts
- Heatmaps

2. What are the uses of data visualization?

Uses of Data Visualization:
- It helps to identify trends and patterns in data.
- It effectively convey the complex information.
- It facilitates the informed decision making.
- It discovers insights and relationships in data.
- It monitors performance and changes over time.

3. What are the best data visualization tools for Data Scientists ?

The best data visualization tools for Data scientists are Tableau and Power BI. Both of these tools

offer powerful visualization and analytics capabilities.
Free Data Visualization Tools
Several free data visualization tools, including RAWGraphs, Looker Studio, Tableau Public, Microsoft Power BI, Visualize Free, Plotly, Datawrapper, Flourish, Dygraphs, and Highcharts, offer diverse options for creating interactive and visually appealing visualizations, enabling users to explore and communicate insights from their data effectively.

4. Best Open Source Data Visualization Tools

- Matplotlib
- Seaborn
- Plotly
- Bokeh
- D3.js

5. Best Python Data Visualization Tools

Some of the Python Data Visualization Tools are as follows:

- Matplotlib
- Seaborn
- Plotly
- GGplot
- Altair
- Bokeh
- Pygal

These questions are intended to test students' understanding of fundamental AI concepts and their implications in the medical field.

Class 14

1. **The theme:** Introduction to Google Docs and Microsoft Office Web Apps cloud services. Creation accounts to work with cloud services. Study of operation modes associated with file storage, sharing and processing. Use of mobile technologies for receiving an information access. GPS navigators. GSM a signaling.

2. The goal: The aims of this class are to introduce the students to Web service in the Cloud and Standards of mobile technologies, to introduce the students to Internet, and to give a brief idea on Web Browsers and Search Engines.

3. The learning objective: Having studied this class the student will be able to:

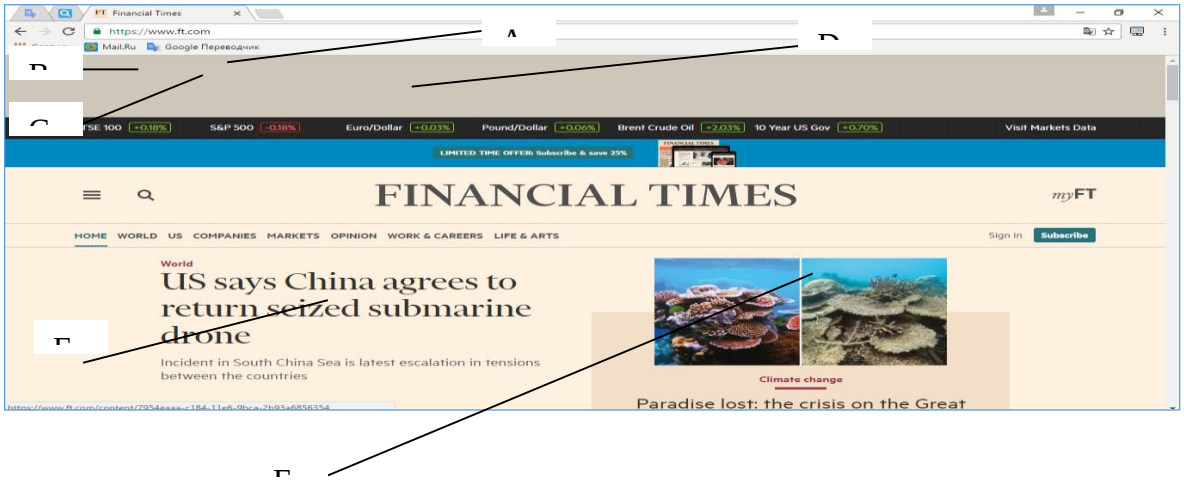
1. efficiency of cloud technologies application
2. list facilities/benefits of cloud technologies;
3. define what Internet is;
4. list facilities/benefits of Internet;
5. describe the ways to connect to Internet;
6. use a web browser to surf the Internet;
7. use search engines to find information on the Internet;
8. create and use an e-mail account;
9. use an electronic services;
10. describe the security and risks involved in Internet.

4. Key questions of the theme:

1. What is the Internet?
2. What is meant by an "Internet protocol"?
3. What type of telecommunications hardware allow you access the Internet?
4. What are the advantages and disadvantages of using Wi-Fi as a method of Internet connectivity?

5. What are Web Browsers?
6. What are Search Engines?

Practical tasks

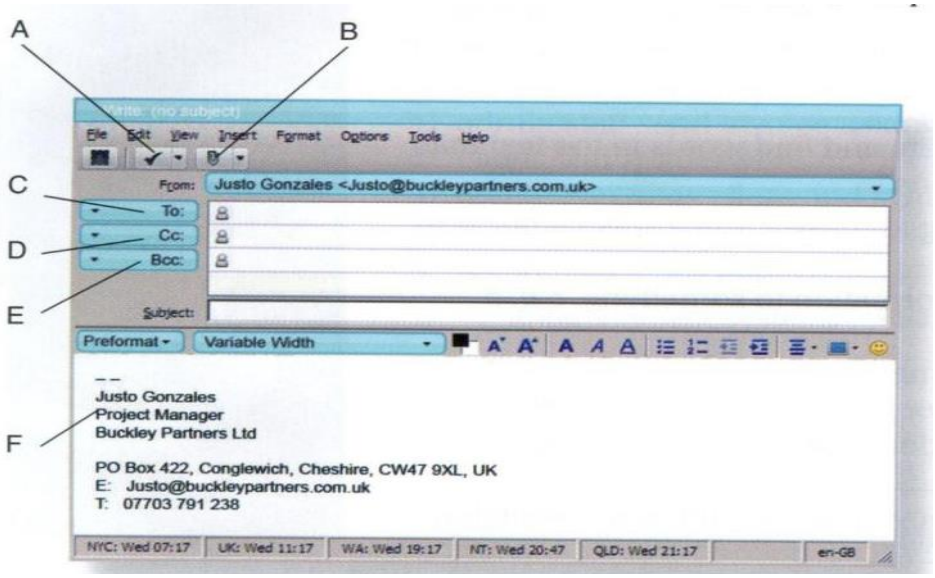


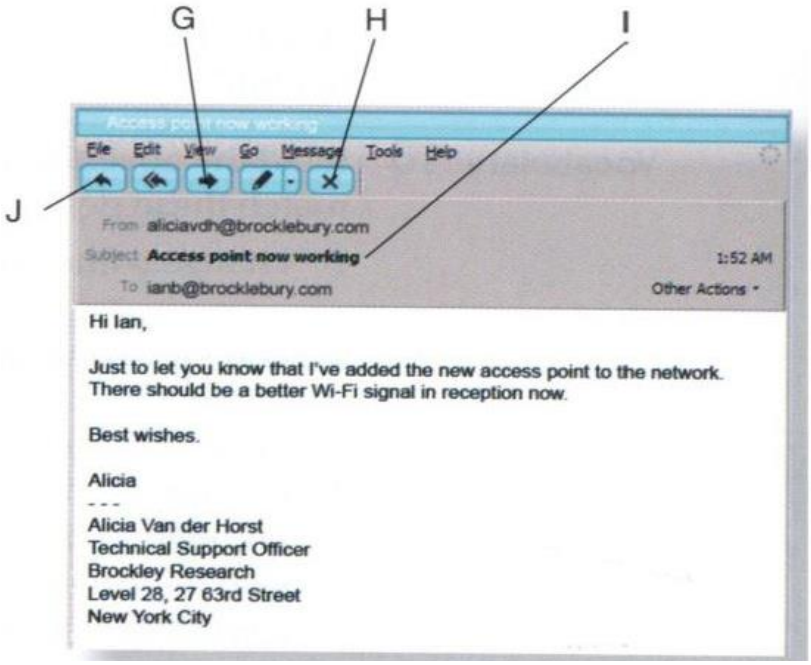
Match these words to A-F in the screenshot of a browser below.

1. Web address _____
2. Bookmarks bar _____
3. "Back" button _____
4. Tab _____
5. Link _____
6. "Refresh" button _____

Match these words to A-J in the screenshots of a e-mail below.

1. Subject line _____
2. Recipient's address _____
3. E-mail signature _____
4. Attachment button _____
5. Spell checker _____
6. Forward _____
7. Blind copy address _____
8. Reply button _____
9. Copy address _____
10. Delete _____





1. Write the name of each country listed below next to its correct two-letter Internet domain extension. Use online or print resources if necessary.

Countries		
Australia	Iceland	Russia
Canada	Iraq	Sweden
Chile	Israel	Taiwan
Egypt	Mexico	United Kingdom
Germany	Norway	Kazakhstan

Internet Extensions

1. .cl: _____
2. .ca : _____
3. .au : _____
4. .eg : _____
5. .de : _____
6. .mx: _____
7. .is : _____

4. Complete the table giving below. Describe the each type of Internet protocols. The first record has been completed as an example**.**

Internet Protocol	**Refers to**	**Description**	**Internet Services**
SMTP	Simple Mail Transfer Protocol	A protocol for sending e-mail messages between servers	E-mail
POP 3			
FTP			
HTTP			
HTTPS			
VoIP			

5. Complete the table giving below. Describe the each method of Internet connectivity. The first record has been completed as an example

Method	Advantage	Disadvantage	Best suited for
Dial-up connections	• Low cost • Safety • Availability	• Slow in speed • Unstable • Need a phone line • Phone will be engaged when using the Internet	Places where Internet access is needed for a longer period
Landline			
Wi-Fi			
Satellite			
Cell phones			

6. Practical task.

1. Go to www.amazon.co.uk*(make a screenshot)*. And use some of the hyperlinks to browse the different sections of the website. Next go to the books section, and find ICT books and create a bookmark *(make a screenshot)*.
2. Go to www.wikipedia.org and browse using the hyperlinks on the site *(make a screenshot)*. Display the History bar and look at the entries for the sites you have visited today *(make a screenshot)*. Delete the bookmark you created in above step and Clear the browsing history and temporary Internet files.
3. Visit **Ошибка! Недопустимый объект гиперссылки.**ofind out the weather for your location *(make a screenshot)*. Again go to your default home page and use the back button to return to the weather site. Set a bookmark for this page. Next create a folder called Weather and move the bookmark you just created into that folder. Delete the weather folder.
4. Go to www.yahoo.com and go to the News category and browse the headlines *(make a screenshot)*. Then use the Back button to return to the main Yahoo page. Search for cars in the Video search category.
5. Go to www.bbc.co.uk and look for all occurrences of the word news on the page. Find a link to world news. Use it to browse some international news items *(make a screenshot)*.
6. Go to www.mapquest.com. Enter your country and get the map for the area you live *(make a screenshot)*. Right-click on the map. Save the map to a location on your computer with the name My Home.
7. Go to http://egov.kz/cms/ru and choose the English language *(make a screenshot)*. Browse the different sections of the website. Click the *Tourism and Sports* section, find the address of Embassy of the RK in the Republic of India*(make a screenshot)*.
8. Go to a search engine in your web browser. Search for *images* of *cars*. Copy on of the pictures found into a Word document and save it, calling it *My Car*.
9. Go to your home page and use the *Search Bar* to look for News. View one of the sites that are returned. Then use the hyperlinks on the site to view some of the current top stories. Again use *Back* button to return to the search engine. Find information on flights to Kazakhstan*(make a screenshot)*. Clear your web browser's *History*.

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey

7. References

1.June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge,

MA, COPYRIGHT © 2014.
2.Shynybekov D.A. and others. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p., ISBN 978-601-7911-03-4 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)

8. Control questions:

1. Try to answer the following questions using an Internet *search engine*.
2. Who is the first computer programmer?
3. What was the name the first computer?
4. Who is the founder of the company "Apple"?

Class 15

1. The theme: Installation and use of application programs in the professional sphere. Working in the Matlab environment for scientific and technical computing. Working with the Matlab toolboxes for applied problem solving.

2. The goal: The aims of this class are to provide a knowledge and skills in performing calculations on the enter data using formulas in STATISTICA 10, to give the basic ideas about charts.

3. The learning objective: Having studied this class the student will be able to:

- insert formulas by using arithmetic operations with contents of the cells;
- format the cells and the contents;
- create charts for given data set;
- customize the features of charts.

4 Key questions of the theme:

1. What are the advantages of using computerized Spreadsheets?
2. What kind of documents you can create in the STATISTICA? Which extensions are these documents?
3. What operations can be performed with the columns and rows of a spreadsheet?
4. How to create a formulas in the spreadsheet?
5. How to create a charts in the STATISTICA?
6. What kind of charts in the STATISTICA do you know?

1. Practical task. Spreadsheet formula. (5-10)

1. Start STATISTICA 10.
2. Create a new document: *Home →File →New→Spreadsheet.*
3. Create the table (6 variables by 15 cases).
4. Type the titleof the table "*Blood pressure*" in the white box below the line: «*Data: Spreadsheet1 (6v by 15c)»* (figure 1) .
5. Double-click on the *Var1*. The *Variable* specification dialog will be displayed.In the *Name* field type "*The upper limit of blood pressure before taking the drug*". Click the  button to move to the next column. In the *Name* fieldtype "*The upper limit of blood pressure after taking the dru*g". Click the  button. In the *Name* field type "*Difference*". Click the  button. In the *Name* field type "*The lower limit of blood pressure before taking the drug*". Click the  button. In the *Name* fieldtype "*The lower limit of blood pressure after taking the drug*". Click the  button. In the *Name* fieldtype "*Difference*" (figure 1).
6. Enter the data shown in figure 1.
7. Double-click on the variable name *Difference* in the third column.In the *Long name* fieldat the bottom of the dialog, enter the formula: = v2-v1 and click the OK button(figure 2).

Data: Spreadsheet1* (6v by 15c)

	Blood pressure					
	1 The upper limit of blood pressure before taking the drug	2 The upper limit of blood pressure after taking the drug	3 Difference	4 The lower limit of blood pressure before taking the drug	5 The lower limit of blood pressure after taking the drug	6 Difference
1	210	201		130	125	
2	169	165		122	121	
3	187	166		124	121	
4	160	157		104	105	
5	167	147		112	101	
6	176	145		101	85	
7	185	168		121	98	
8	206	180		124	105	
9	173	147		115	103	
10	146	136		102	98	
11	174	151		98	90	
12	201	168		119	98	
13	198	179		106	110	
14	148	129		107	103	
15	154	131		100	82	

Figure 1.

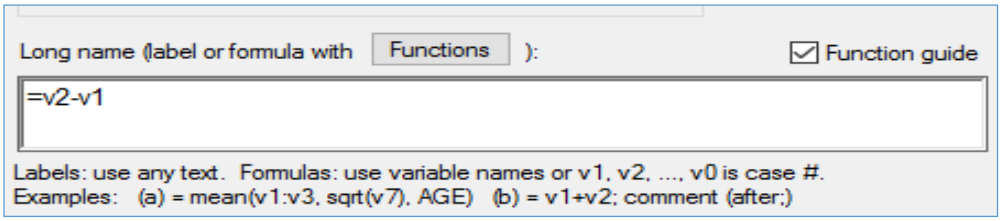


Figure 2.

A dialog will be displayed that informs you whether the formula is formally correct. Click the *Yes* button to proceed.

Double-click on the variable name *Difference* in the sixth column. In the *Long name* fieldenter the formula: = v5-v4 and click the OK button. Click the *Yes* button to proceed.

8. Save the file: *Home→File→Save→Save As*"*Blood pressure.sta*".

2. Practical task. Spreadsheet formula. (5-10)

1. Start STATISTICA 10.

2. Open the *Adstudy.sta* data file.

3. Create a new variable that is the mean of variables 3 through 25. Double-click on the first blank variable header (after variable 25).

4. The *Add Cases and/or Variables* dialog will be displayed. Click the OK button to accept the default , which is to add one variable.

5. The *Variable* specification dialog for the new variable will be displayed. In the *Display format* grou p, select *Number*. In the *Long name* field at the bottom of the dialog, enter: =mean(v3:v25) (figure 3). Click the OK button. Click the *Yes* button to proceed. The new variable is now filled with the mean of variables 3 through 25 for each case.

6. Close the *Adstudy.sta* file, doesn't save changes.

3. Practical task. Batch formulas.

1. Start STATISTICA 10.

2. Open the *Characteristics.sta* data file. This data file contains information about patients in a study. For this example 1) calculate patient Body Mass Index (BMI) and 2) convert height to centimeters (cm), and add these two variables to the data set.

On the *Data* tab, in the *Transformations* group, click *Transforms* to display the *Batch Transformation Formulas* dialog (figure 4).

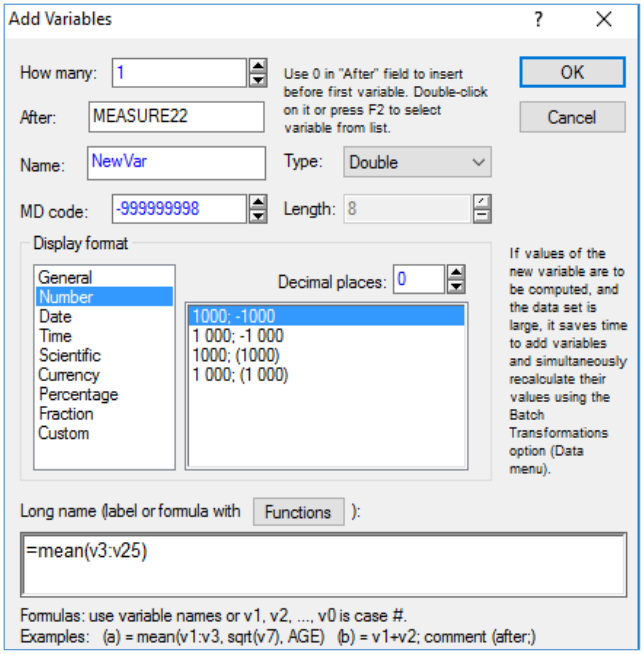


Figure 3.

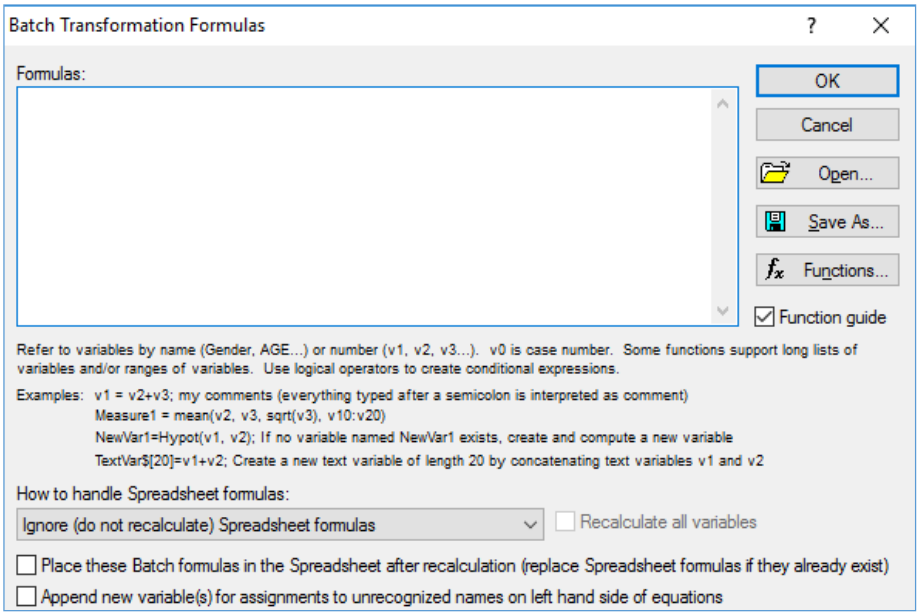


Figure 4.

3. In the *Formulas* field, enter the list of transformation formulas to be applied to the active data spreadsheet:
BMI=('weight (lb)' / 'Height (in)' **2)*703
'Height (cm)' = 'height (in)' *2.54
Separate each transformation formula by a return (press *Enter* on keyboard) (figure 5).
4. Click the OK button in the *Batch Transformation Formulas* dialog. The *Add New Variables?* will be displayed; click the *Yes* button to add the two new variables to the *Characteristics.sta* data file. A message will be displayed to information whether the expressions you entered in the *Batch Transformation Formulas* dialog are correct. If they are OK, click *Yes* to proceed. STATISTICA calculates the formulas and adds the two variables, *BMI* and *Height (cm)*, to the spreadsheet.
5. Close the *Characteristics.sta* file, doesn't save changes.

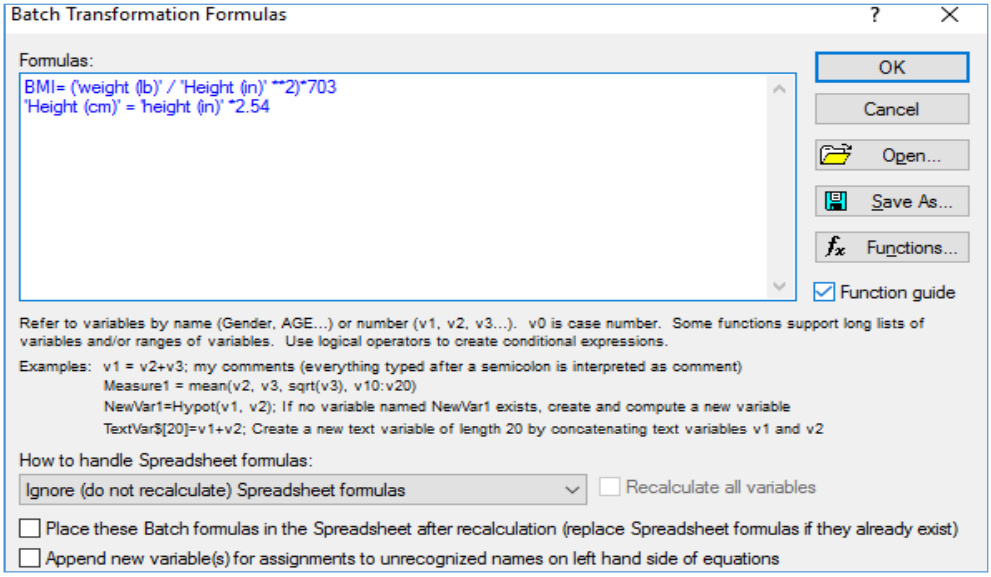


Figure 5.

4. Practical task. Input data directly from Excel.

1. Start STATISTICA 10.
2. On the STATISTICA *Home* tab, in the *File* group, click the *Open* arrow and select *Open Examples* from the drop-down menu to display the *Open a STATISTICA Data File* dialog.
3. From the *Files of type* drop-down list at the bottom of the dialog, select *Excel Files (*.xls, *xlsx, *xlsm)*. Double-click the *Datasets* folder, and then select the *Weather report* data file, which is an Excel file. Click the *Open*, and the *Opening file* dialog will be displayed.
4. Click the *Open as an Excel Workbook* button, and the Excel file will be displayed. Note that when an Excel worksheet is opened in STATISTICA, the Excel and STATISTICA menus merge, enabling you to access key functionality for both applications.
5. From the *Statistics* menu, select *Basic Statistics/Tables.The Select Excel Range for the Analysis* dialog will be displayed. Click the OK button in the *Select Excel Range for the Analysis* dialog to accept the defaults; the dialog will close, and the *Review/Edit Column Types* dialog will be displayed. Click OK button.
6. *Startup Panel* is displayed. Select *Descriptive Statistics* analysis.Click OK button. The analysis specification dialog will be displayed (figure 6).

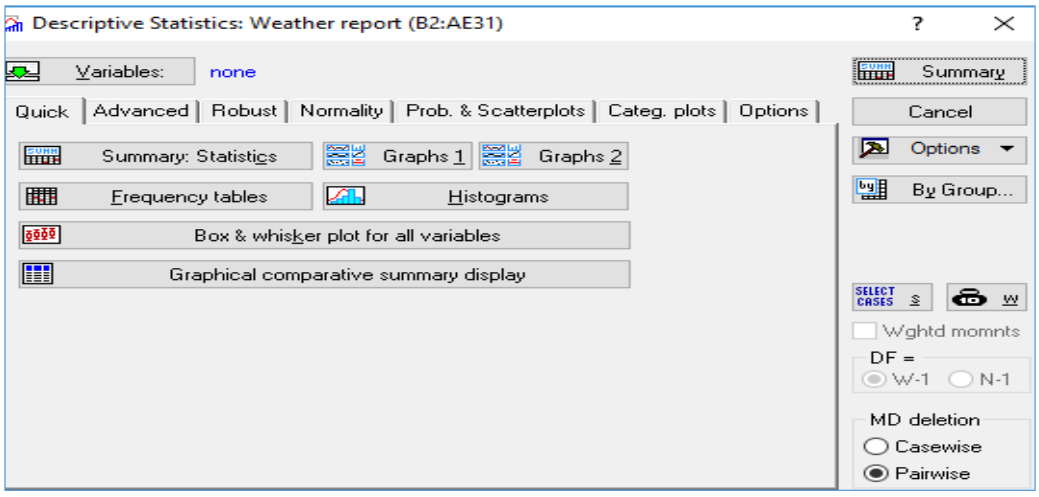


Figure 6.

7.Click the *Variables* button, and in the variable selection dialog, select *Temperature.*Click OK in the variable selection dialog to return to the *Descriptive Statistics*dialog.
8.Click *Summary* button. The result table will be displayed (figure 7).

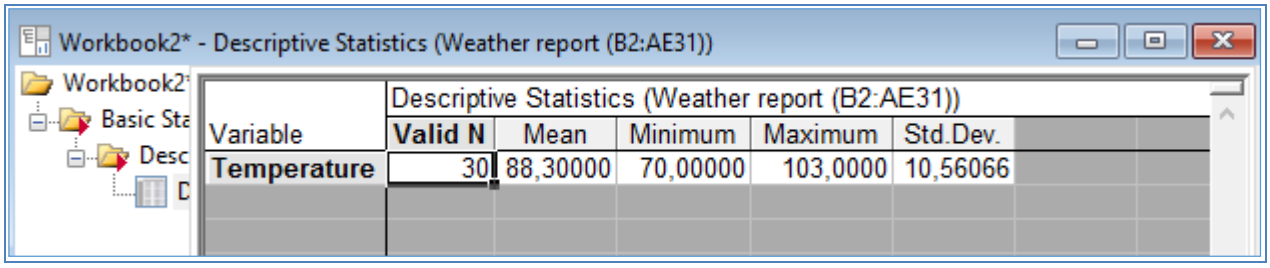


Figure 7.

9. Save the file as *Weather report.stw*.
6. Practical task. Filter Duplicate Cases.
1. Start STATISTICA 10.
2. Open the *Duplicates.sta* data file. Notice that is 10v by 60c (10 variables by 60 cases).
3. On the *Data* tab, in the *Transformations* group, click *Filter/Record* menu, select *Filter Duplicate Cases* to display the *Filter Duplicate Cases* dialog. In the *Input* group box, the *Variables* option is used to specify the basis of distinction for duplicates. Click the *Variables* button, and in the variable selection dialog, select *Respondent* so that all respondents will be checked for duplicates. Click OK in the variable selection dialog to return to the *Filter Duplicate Cases* dialog (figure 8).

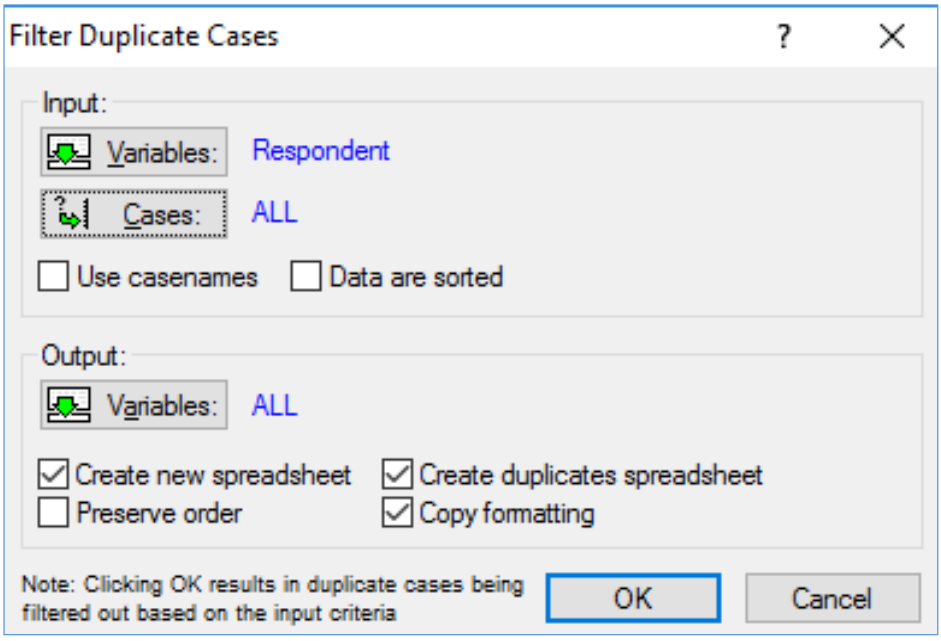


Figure 8.

4. In the *Input* group box, verify that all *cases* are selected.
5. In the *Output* group box, verify that all *variables* are selected.
6. Verify that the *Create new spreadsheet* check box is selected (the default), and select the *Create duplicates spreadsheet* check box.
7. Leave the last two options at their defaults: the *Preserve order* check box is cleared, and the *Copy fo rmatting* check box is selected. Click OK.
8. Two new spreadsheets will be generated. One of the spreadsheets is 10v by 51c and contains the

respondents from the original spreadsheet excluding the duplications. The other spreadsheet is 10v by 9c and contains the duplicate respondents that were extracted from the original spreadsheet.
9. Close the file, doesn't save changes.

7. Practical task.Creating Subsets.
1. Start STATISTICA 10.
2. Open *Boston2.sta* data file. This data set contains over a thousand cases. We want to extract housing tracts with low median prices.
3. Select the *Data* tab, and in the *Manage* group, click *Subset* to display the *Create a Subset* dialog (figure 9).

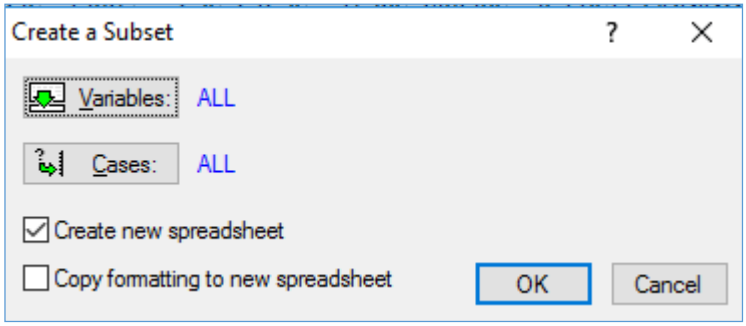


Figure 9.

3. Click the *Cases* button to display the *Spreadsheet Case Selection Conditions* dialog, which contains options to create conditions to define the selection of cases to be considered for the sample.
4. Select the *Enable Selection Conditions* check box to activate the options, and then select the *Specific, selected by* option button in the *Includecases* group box to specify which cases to include in the analysis. Type v1='LOW' in the *Expression* text box.
5. Click the OK button to set the selection conditions and return to the *Create a Subset* dialog, and click the OK button in this dialog to create the new spreadsheet. The resultant spreadsheet contains 334 cases and all 15 variables from the original spreadsheet. For the *Price* variable, all cases have a value of LOW.
6. Close the file, doesn't save changes.

8. Practical task. Creating charts.
1. Start STATISTICA 10.
2.Create a new document: *Home →File →New→Spreadsheet.*
3. Create the table (1v by 7c).
4. Type the titleof the table "*Mortality from cancer among the population of the CIS countries, 2013 y.*"
5. Rename the rows in the CIS countries names. Enter the data, as shown in figure 10.

	Mortality from cancer among the population of the CIS countries in 2013 y.
	1 Number of deaths per 100 thousand population
Kazakhstan	221
Russia	180
Ukraine	170
Belarus	198
Uzbekistan	113
Azerbaijan	188
Kyrgyzstan	197

Figure 10.

6. Click the *Graphs* tab on the Ribbon. Click the *2D* button in the *More…* group, and select *Pie Charts* from the drop-down list.
7. The *Pie Charts* dialog will be displayed, click *Advanced* tab.
8. Click the *Variables* buttonand in the variable selection dialog, selectname of the variable. Click OK in the variable selection dialog to return to the *Pie Charts* dialog.
9. Choosethe*Pie Charts – Values*graph type.
10. Click the *Spreadsheet* button and choose *Case names*.
11.Choose *Text and Percent* in the *Pie legend* window.
12. Click OK button. The Pie Chart will appear (figure 11).

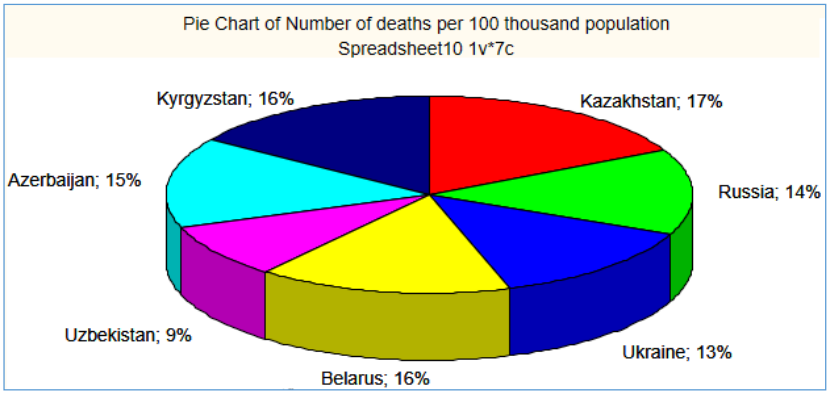


Figure 11.

13. Double click on the Pie Chart. Change the *Outside Background color*, *Inside Background color*, *Font size* of title, *Explode distance* (figure 12).

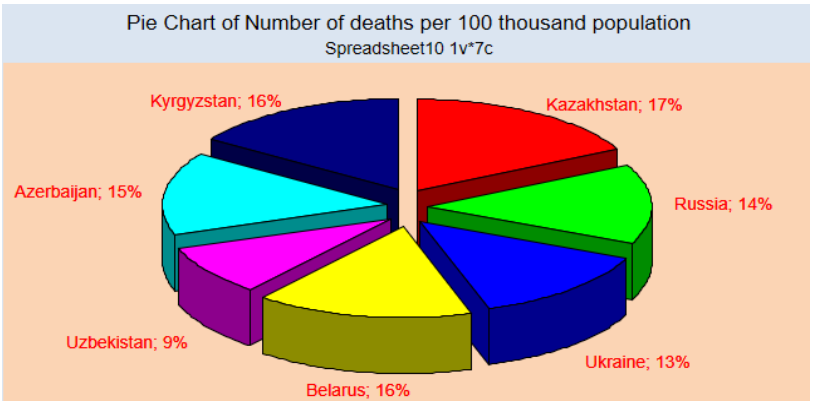


Figure 12.

14. Click the *Graphs* tab on the Ribbon. Click the *2D* button in the *More…* group, and select *Bar/Column Plots* from the drop-down list.
15. The *Bar/Column Plots*dialog will be displayed, click *Advanced* tab.
16. Click the *Variables* button,and in the variable selection dialog, selectname of the variable. Click OK in the variable selection dialog to return to the *Bar/Column Plots*dialog.
17.Choosethe *Regular*graph type.Choose the *Vertical* orientation.Click OK button.The Bar/Column Plot will appear (figure 13).
18. Save the workbook: *Home→File→Save→Save As*"*Chart.stw*".

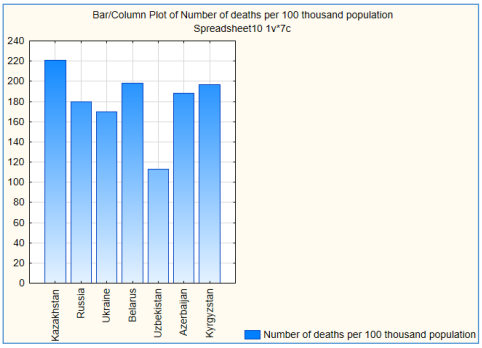


Figure 13.

9. Practical task. Creating charts.

Using the data given below create the Bar/Column Plot "*Number of hospitals in the Republic of Kazakhstan, 2015 y.*"

Republic of Kazakhstan	**901**
Akmolinskaya	38
Aktyubinskaya	47
Almatinskaya	86
Atyrauskaya	36
East Kazakhstan	88
Zhambylskaya	57
West Kazakhstan	37
Karagandinskaya	83
Kostanayskaya	51
Kyzylordinskaya	50
Mangistauskaya	29
Pavlodarskaya	42
North Kazakhstan	28
South Kazakhstan	122
Astana	31
Almaty	76

10. Practical task. Creating charts.

Using the data given below create the Pie Chart*"Sickness rate of active tuberculosis on age groups, 2015 y."*

0-14	15-17	18-34	35-54	55-64	65 and elder
4	5	44	32	9	5

5. The main forms / methods / technology of training to achieve the final learning outcomes discipline: Computer based teaching.

6. Types of control for assessing the level of achievement of the final learning outcomes of the discipline: individual task, oral survey.

7. References

1. June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2014.

2. Shynybekov D.A. and others. Information and communication technology. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p. (A textbook in English with the stamp of the Ministry of

Education and Science of the Republic of Kazakhstan)
3. Vijay K. Vaishnavi. Design Science Research Methods and Patterns: Innovating Information and Communication Technology, 2nd Edition 2015 by CRC Press.

8. Control questions:

1.What are the advantages of using computerized Spreadsheets?
2.What kind of documents you can create in the STATISTICA? Which extensions are these documents?
3.What operations can be performed with the columns and rows of a spreadsheet?
4.How to create a formulas in the spreadsheet?
5.How to create a charts in the STATISTICA?
6.What kind of charts in the STATISTICA do you know?