

Ministry of Education and Science of Ukraine  
**ODESSA NATIONAL ACADEMY OF  
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International Competition of  
Student Scientific Works

**BLACK SEA  
SCIENCE 2021**  
**PROCEEDINGS**



**ODESSA, ONAFT 2021**

Ministry of Education and Science of Ukraine  
Odessa National Academy of Food Technologies

International Competition of Student Scientific Works

# **BLACK SEA SCIENCE 2021**

**Proceedings**

Odessa, ONAFT 2021

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# **3. INFORMATION** **TECHNOLOGIES,** **AUTOMATION AND** **ROBOTICS**

## TELEGRAM BOT STUDENT ASSISTANT

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***Abstract.** Modern technologies are developing at lightning speed, which is why more and more opportunities appear. The idea was to improve the access and quality of daily information for our college students.*

*This paper describes the creation and functionality of the Student Assistant project - a telegram bot, which is located in the Telegram messenger.*

***Keywords:** telegram bot, study, assistance.*

### I. INTRODUCTION

Today, modern technologies play an important role for a modern person. Each year technologies are moving one step forward, their use becomes easier, more convenient and more efficient each time. And also there are new ideas for their use by humans in everyday life. Today, everyone can learn something or learn something new if they have access to the Internet. Many books that previously could be borrowed from the library or bought from the bookstore for a small fee can now also be read or bought online for home delivery. Phones, which at first were intended only for calls, were modified into smartphones, which allow not only making calls but also taking pictures, listening to music, watching videos, downloading additional mobile applications, making purchases, etc. All modern devices are made in such a way that a person, if necessary, could modify it himself and make it more convenient for himself. It was decided to make one of such modifications in order to find out various necessary information for a student during his studies with the help of the Telegram messenger.

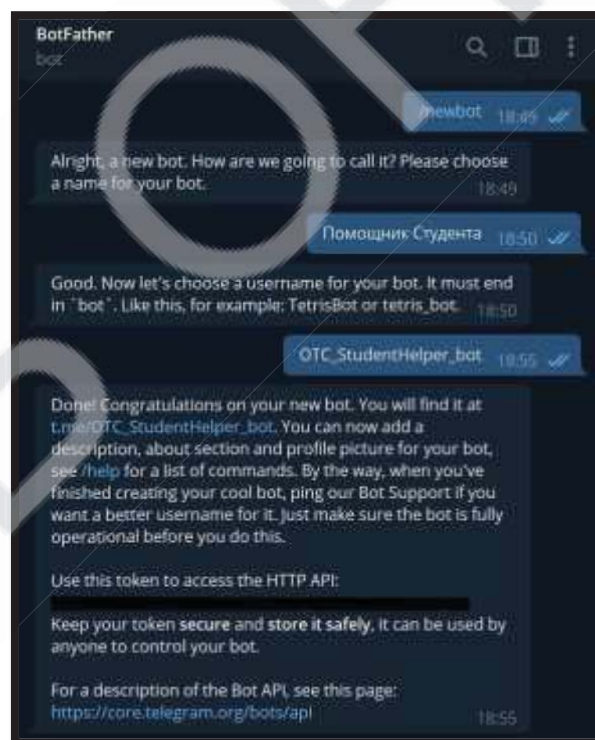
## II. LITERATURE ANALYSIS

### 2.1. What is a telegram bot?

A telegram bot is a program designed to process specific requests that the bot supports from users automatically in the Telegram messenger. This technology allows you to automate a bunch of repetitive actions, as well as to make their use more efficient. Today there are many bots for various purposes: music, games, photo processing, translators, etc. There is a main bot called BotFather, which allows users of the Telegram messenger to create their own telegram bot. Then users can write a program code and bind it to their bot, guided by the official Telegram messenger documentation on creating a telegram bot.

### 2.2. Creation of a telegram bot

First of all, you need to create a bot using the main bot "Telegram" BotFather. To create it, you need to write the /newbot command, then give it a name, tag and a short description. The user is allocated a so-called unique token, which is created for each bot. Done, the outer shell of the bot is created!



The bot becomes available in Telegram for all users, but it does not respond to requests yet. In order for the bot to respond to requests from users, it is necessary to write program code for it that will process these requests. You should also create a convenient bot interface to quickly switch. It was decided to use the command keyboard, which consists of request messages, for quick switching.

### **2.3. What features have been implemented?**

In total, the bot has 4 main functions:

1. Replacements and news
2. Schedule
3. References
4. Calculating the average score

#### **Replacements and news**

The implementation of this section was done by creating a telegram channel and linking it to the instagram profile of our college. To bind the telegram channel to the intstagram profile, the PosterBot telegram bot was used, but after its update, this function became paid, so this channel is currently inactive.

#### **Schedule**

To implement this section, the schedule of classes for all groups was taken from our college. For convenient use, the schedule has been converted into an electronic form using Microsoft Excel.

#### **References**

It was originally planned to create three reference books: a reference book on mathematics, a reference book on the Ukrainian language, and a reference book on Ukrainian literature. But the guide to the Ukrainian language was not implemented due to the complexity and number of topics, so very good sources were left, which are small video tutorials on the YouTube platform. The other two guides were created manually using Microsoft Word. The Mathematics Handbook includes two sections of mathematics: algebra and geometry. These sections contain their main topics that are available to every user. The reference book on Ukrainian literature is implemented in the same way.

#### **Calculating the average score**

This function was created as an additional tool for calculating the average score of your grades. It is useful in that you do not need to count the number of grades, it is enough to enter them and the program will calculate your average score. It also provides for checking for errors in the input data.

### III. OBJECT, SUBJECT, AND METHODS OF RESEARCH

#### Bot development

It was decided to develop a telegram bot in the Python 3.7 programming language. The IDE PyCharm was used as a development environment.

The meaning of the code is that to accept messages from the user, the bot uses a list of all available messages that can come from the user, as well as information for each request. All requests that have any files are processed in one cycle, and simple ones return messages and allow you to navigate the bot interface.

To work with a telegram bot in the source code, you must use the “telebot” library:

```
import telebot
```

Next, to connect our bot to its source code, the telegram bot token is used:

```
bot = telebot.TeleBot('there should be a token')
```

To accept requests, the response of which will be in the form of files (photos), the list was used:

```
msslwr_dict = {'Received request': 'file.png',...}
```

The telegram bot implements about 100 requests that return files.

The handler of requests, the response of which will be in the form of files, looks like this:

```
1. @bot.message_handler(content_types=['text']) #| Text Query Processor
2. def send_text(message):
3.     msslwr = message.text.lower()
4.     if msslwr_dict.get(msslwr): #| Dictionary message
5.         if isinstance(msslwr_dict.get(msslwr), list): #| Is the data a list?
6.             for photo_ in msslwr_dict.get(msslwr): #| Go through the list
7.                 bot.send_photo(message.chat.id, open(photo_, 'rb'))
8.         else: #| Send the photo
9.             bot.send_photo(message.chat.id, open(msslwr_dict.get(msslwr), 'rb'))
```

This text query handler checks for the presence of a query in the msslwr\_dict dictionary, and if such a query exists, it sends the file that matches the query.

The remaining 23 requests are interface switches and return text in response.

## IV. RESULTS

A telegram bot called "Student Assistant" was implemented, which has a built-in interface and responds to all queries built into the virtual keyboard.

Replacements and news are presented in the form of a telegram channel, where replacements and news are posted. It is convenient when you have all the necessary information at hand, what will be tomorrow in the educational institution, which pairs will be and which will not be, which will change.

Schedule of all college groups is available. This is convenient, since students often do not remember which pairs they have, and the schedule can be viewed directly in the telegram bot, and this is done almost instantly. In order to find out the schedule of a specific group, you need to write "/" and the name of the group, for example, "/ 2PII-05".

Guides are available for preparing for ZNO in three main subjects: mathematics, Ukrainian language and Ukrainian literature. First and second year students are often worried about the success of the test. This will allow them to concentrate on learning, and if they have forgotten something, they can immediately see it in the telegram bot. The reference books covered all possible topics that are present at the ZNO.

The ZNO tab allows you to go to the official ZNO website, or go to the resource of online ZNO tests.

The GPA feature also works and has been added as an additional tool.

### **To implement the bot, you needed:**

1. Create about 300 files that compose directories and schedules using auxiliary programs.
2. Two weeks of development.

### **There are also two main disadvantages of this bot:**

1. Without the Internet, the bot will not work, but the correspondence with the bot will be saved, and you can see the previous files that the bot sent.
2. For permanent support of the bot operation, a permanent remote server is required. Such services are paid.

## V. CONCLUSIONS

This project can be useful to all schoolchildren and students, especially those who are preparing for ZNO. And also it can be very useful for students of our educational institution, as they can additionally keep track of the latest news and posts from the college, as well as easily and easily find out the schedule of their group. Most importantly, this project can be improved.

## VI. REFERENCES

1. <https://tproger.ru/translations/telegram-bot-create-and-deploy/>
2. <https://www.youtube.com/watch?v=wj1Vwq3IrL4&list=PLwVBSkoL97Q3phZRyInbM4lShvS1cBl-U>
3. <https://core.telegram.org/bots/api>

COMPUTERIZED DIAGNOSIS OF PROSTATE CANCER BASED ON WHOLE SLIDE HISTOLOGY IMAGES AND DEEP LEARNING METHODS Authors: Valery Malyshev, Dmitry Voynov, Elizabeth Lapo Advisor: Vassili Kovalev United Institute of Informatics Problems (Belarus).....	391
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