PANIMALAR INSTITUTE OF TECHNOLOGY
CHENNAI – 600 123

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS8611-MINI PROJECT

AUTOMATION OF MESSAGE SENDING PROCESS USING SPECIALIZED SOFTWARE

A MINI PROJECT REPORT

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PANIMALAR INSTITUTE OF TECHNOLOGY
CHENNAI – 600 123

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BONAFIDE CERTIFICATE

Certified that this project report "**AUTOMATION OF MESSAGE SENDING PROCESS USING SPECIALIZED SOFTWARE" is the bonafide work of SRUTHI B (211519104160), SUJITHA S (211519104162), HARINI S (211518104051)** of Third Year B.E - CSE during the academic year 2020 – 2021 who carried out under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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We wish to express our sincere thanks to all those who were involved in the completion of this project.

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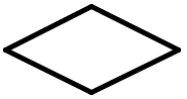
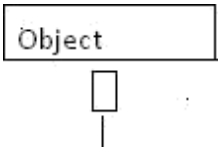
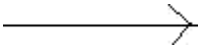
ABSTRACT

The article discusses a method for automating the sending congratulatory messages and images to relatives in the Whatsapp messenger using its web version “WhatsApp Web” due to the lackof an official API for creating bots. Also, a chat bot, which was written with python and can recognize and respond to commands, was implemented. In the modern world, we often face the problem of lack of time. Each person has to do many different things every day. Therefore, sometimes people forget about the important thing: about maintaining a connection with their relatives. Indeed, it takes a significant amount of time to pay attention to everyone. Because of this, people rarely write to each other, and sometimes they completely forget to congratulate a loved one on an important holiday for him. To get rid of the daily time spent, it was decided to create a program that would send cards to relatives on holidays and could also interact win the modern world, we often face the problem of lack of time. Each person has to do many different things every day. Therefore, sometimes people forget about the important thing: about maintaining a connection with their relatives. Indeed, it takes a significant amount of time to pay attention to everyone. Because of this, people rarely write to each other, and sometimes they completely forget to congratulate a loved one on an important holiday for him. To get rid of the daily time spent, it was decided to create a program that would send cards to relatives on holidays and could also interact with them using command.

TABLE OF CONTENTS

LIST OF SYMBOLS

S.NO	SYMBOL NAME	NOTATION	DESCRIPTION
1.	Initial Activity		This shows the Starting point or first activity of flow.
2.	Final Activity		The end of the Activity diagram is shown by a bull's eye symbol.
4.	Decision		A logic where a decision is to be made.
5.	Actor		A role that a user plays with respect to system.
6.	Object		A Real time Entity.
7.	Message		To send message between the life of an object.

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Deep learning is a branch of machine learning is completely based on artificial neural networks , as neural network is going to mimic the human brain so deep learning is also a kind of mimic of human brain. In deep learning, we don't need to explicitly program everything. The concept of deep learning is not new. It has been around for a couple of years now. It's on hype nowadays because earlier we did not have that much processing power and a lot of data. As in the last 20 years, the processing power increases exponentially, deep learning and machine learning came in the picture.

It provides a systematic and methodical overview of the latest developments in deep learning theory and its applications to computer vision, illustrating them using key topics, including object detection, face analysis, 3D object recognition, and image retrieval. The book offers a rich blend of theory and practice.

For example, image classification is straight forward, but the differences between object localization and object detection can be confusing, especially when all three tasks may be just as equally referred to as object recognition.

Image classification involves assigning a class label to an image, whereas object localization involves drawing a bounding box around one or more objects in an image. Object detection is more challenging and combines these two tasks and draws a bounding box around each object of interest in the image and assigns them a class label. Together, all of these problems are referred to as object recognition.

1.1 AIM AND SCOPE OF THEPROJECT:

We often face the problem of lack of time. Each person has to do many different things every day. Therefore, sometimes people forget about the important thing: about maintaining a connection with their relatives. Indeed, it takes a significant amount of time to pay attention to everyone. Because of this, people rarely write to each other, and sometimes they completely forget to congratulate a loved one on an important holiday for him.

The aim of this research project is to propose an end-to-end model for human activity recognition.

SYNOPSIS:

The article discusses a method for automating the sending congratulatory messages and images to relatives in the WhatsApp messenger using its web version “WhatsApp Web” due to the lack of an official API for creating bots.

Also, a chat bot, which was written with python and can recognize and respond to commands, was implemented

In the modern world, we often face the problem of lack of time. Each person has to do many different things every day. Therefore, sometimes people forget about the important thing: about maintaining a connection with their relatives. Indeed, it takes a significant amount of time to pay attention to everyone. Because of this, people rarely write to each other, and sometimes they completely forget to congratulate a loved one on an important holiday for him. To get rid of the daily time spent, it was decided to create a program that would send cards to relatives on holidays and could also interact with the modern world, we often face the problem of lack of time. Each person has to do many

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CHAPTER 2

SYSTEM STUDY

2.1 EXISTING SYSTEM

When analyzing already existing user it was discovered that there are bots that perform various functions. But no bots were found to send messages based on date and time.

2.1.1 LIMITATIONS

- low performance
- Low accuracy

2.2 PROPOSEDSYSTEM

- Nowadays, the popularity of messengers is growing, so it is important to automate processes and create bots.
- Using the web version of the messenger does not limit the bot's capabilities, so this method is working for creating bots created for private use.
- The file system used in the program works more stable, since the main code does not change.

2.2.1 ADVANTAGES

- very accurate
- Time saving

3. LITERATURE SURVEY:

3.1. Project Title: Automation of Message Sending Processes Using Specialized Software

Author: Maksim Vorontsov, Sadikov I. Radmir

Abstract:

The article discusses a method for automating the sending congratulatory messages and images to relatives in the WhatsApp messengerusing its web version “WhatsApp Web” due to the lack of an official api for creating bots. Also, a chat bot, which was written with python and can recognize and respond to commands, was implemented. When these tasks are performed entirely manually, they have a negative effect on the workers' performance, generate time pressure and create a bottleneck in the processes impacting the SMS-delivery schedule. To speed up the actual workflow, we automated each process with the use of batch files and the programming language Python, whose vast library helped us connect to the automating testing suite 'selenium'. As a result, the long-monotonous processes were simplified by simple scripts where a worker only had to introduce a few inputs to accomplish their task. With this automation, we reduced the total workflow time dramatically, making the SMS-delivery workflow smooth and straight forward.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 SOFTWARE SPECIFICATION

The software specification are the specification of the system. It should include both the specification and a definition of the requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide the basis for creating the software requirement specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the team's progress throughout the development activity.

REQUIREMENTS

Operating System	:	Windows 7,8,10 (64 bit)
Software	:	Python
Tools	:	Anaconda (Jupyter notebook IDE)

3.2 HARDWARE SPECIFICATION

The Hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete specification of the whole system. They are used by the software engineers as the starting point for the system design. It shows what the system do not and how it should be implemented.

REQUIREMENTS

Hard Disk	:	500GB and above
RAM	:	4GB and above
Processor	:	I3 and above

CHAPTER 4

SYSTEM DESIGN

4.1 ARCHITECTURE DIAGRAM:

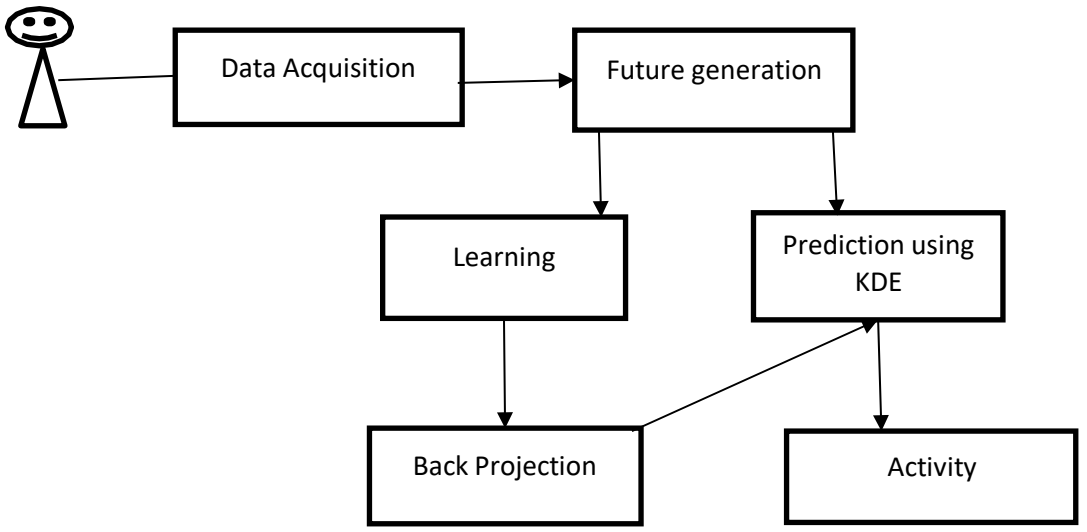

Fig.4.1 Architecture diagram

4.2 UML DIAGRAMS:

A UML diagram is a diagram based on the UML (Unified Modelling Language) with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the system. It is based on diagrammatic representations of software components.

4.2.1 USE CASE DIAGRAM

A use case diagram is a dynamic or behavior diagram in UML. Use case diagrams model the functionality of a system using actors and use cases. Use cases are a set of actions, services, and functions that the system needs to perform. In this context, a "system" is something being developed or operated, such as a web site. The "actors" are people or entities operating under defined roles within the system. Use case diagrams are valuable for visualizing the functional requirements of a system that will translate into design choices and development priorities. They also help identify any internal or external factors that may influence the system and should be taken into consideration. They provide a good high level analysis from outside the system. Use case diagrams specify how the system interacts with actors without worrying about the details of how that functionality is implemented.

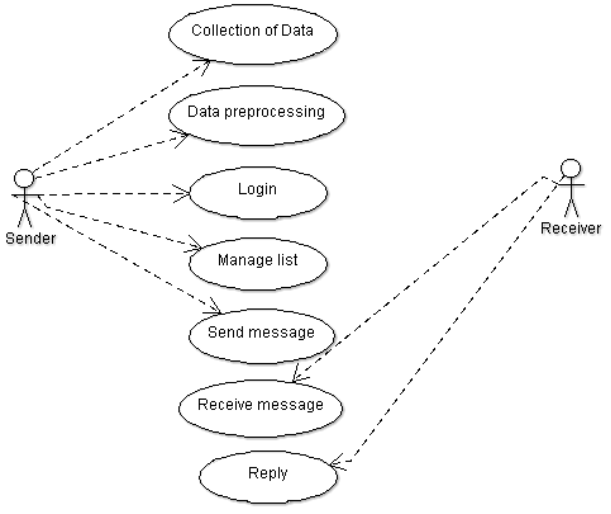

Figure 4.2.1 Use case diagram

4.2.2 CLASS DIAGRAM

A Class diagram is a Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects. The class diagram is the main building block of object- oriented modeling. It is used for general conceptual modeling of the structure of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. The classes in a class diagram represent both the main elements, interactions in the application, and the classes to be programmed.

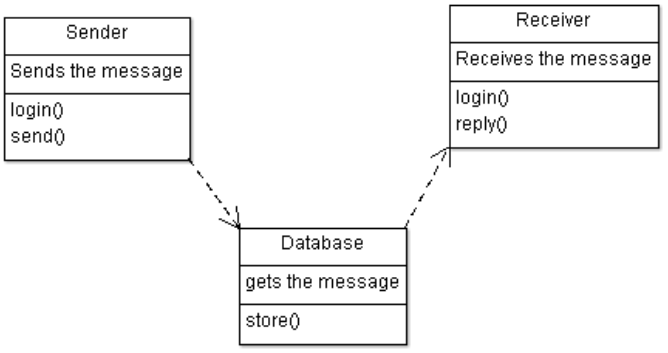

Figure 4.2.2 Class diagram

4.2.3 ACTIVITY DIAGRAM

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all type of flow control by using different elements such as fork, join, etc. The basic purposes of activity diagrams is similar to other four diagrams. It captures the dynamic behavior of the system.

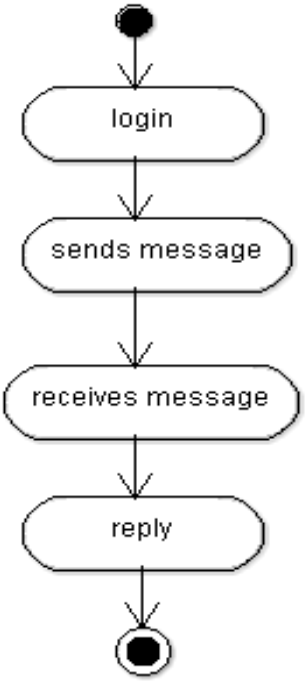

Figure 4.2.3 Activity diagram

4.2.4 SEQUENCE DIAGRAM

A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram. Sequence diagrams describe how and in what order the objects in a system function. These diagrams are widely used by businessmen and software developers to document and understand requirements for new and existing systems.

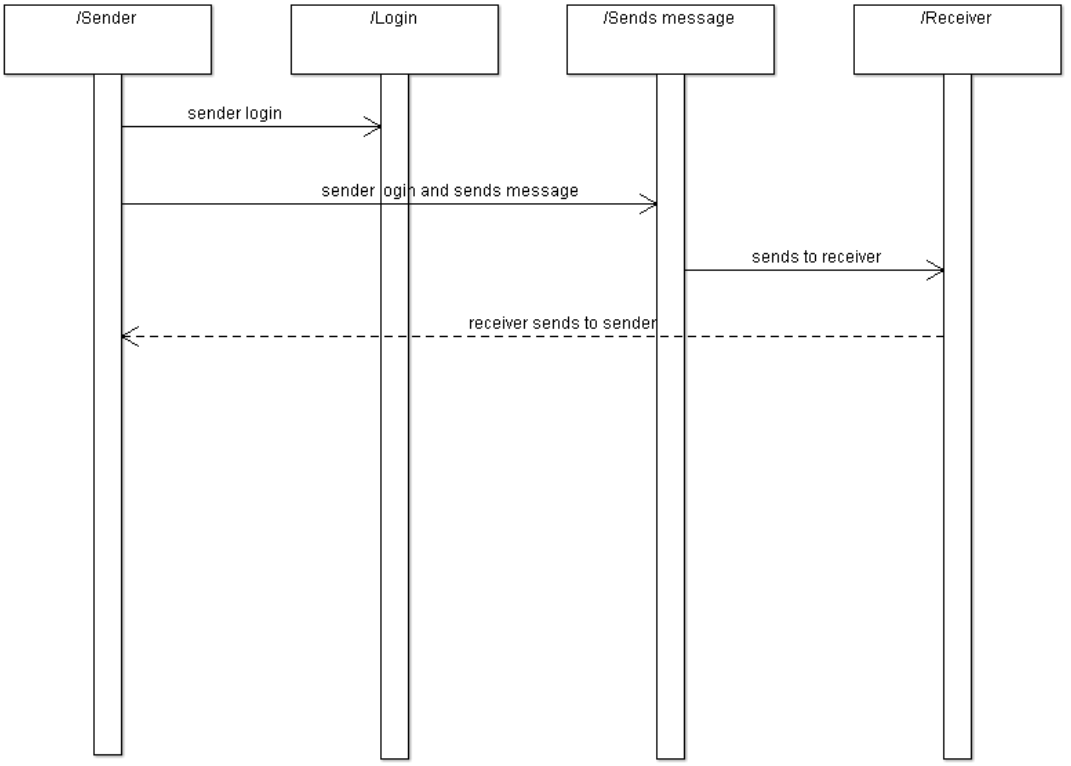

Figure 4.2.4 Sequence diagram

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 MODULES OVERVIEW:

Module is a logical separation of functionality within a project. They are basically used for reusability and better code maintenance. There are four modules used here.

- Module 1: Data Collection
- Module 2: Data Pre-processing
- Module 3: Feature extraction
- Module 4: activity

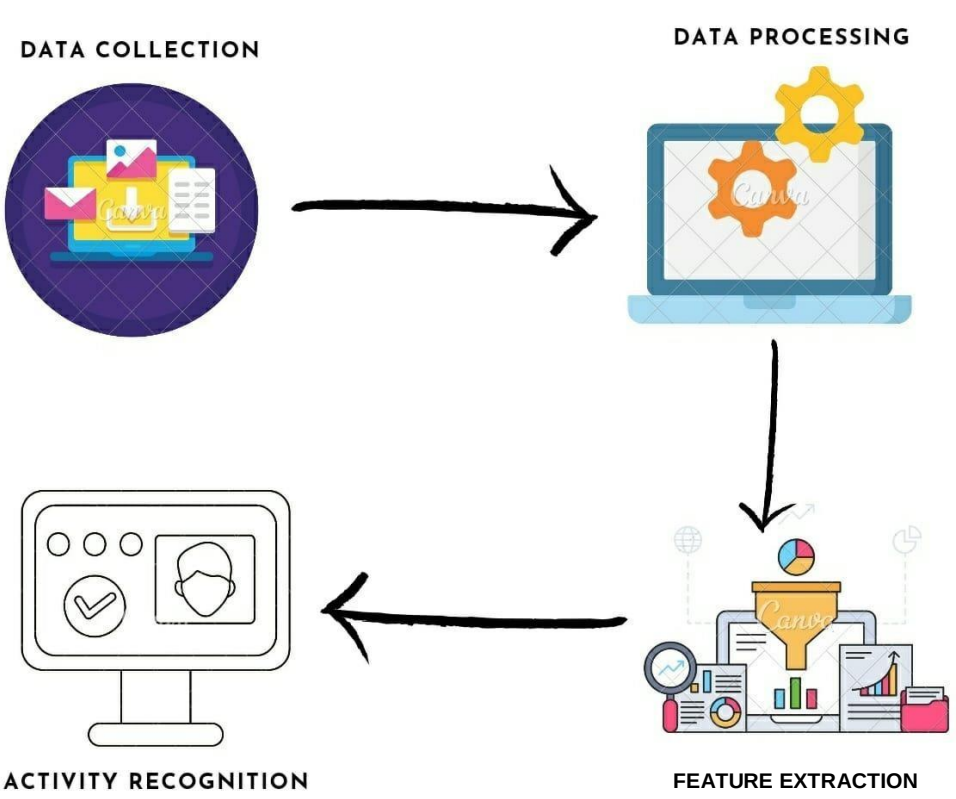

Fig 5.1 Modules Overview

5.2 MODULE DESCRIPTION:

5.2.1 MODULE-I : DATA COLLECTION

UCI Daily and Sports Activities Dataset In this dataset, we follow the same leave-one-subject-out (L1O) cross-validation policy in such that the data of 7 subjects are used for training and the data of the remaining subject are used in turn for validation. This process is repeated 8 times so the data of each subject is used exactly once for validation. The final classification accuracy is estimated by the average results over the above 8 runs.

5.2.1.1 Manual Function

This is the most difficult, as you have to design a custom function, which can load datafor you. You have to deal with Python's normal filing concepts and using that you have toread a .csv file.

5.2.1.2 Numpy.loadtxt function

This is a built-in function in Numpy, a famous numerical library in Python. It is areally simple function to load the data. It is very useful for reading data which is of the same datatype.

When data is more complex, it is hard to read using this function, but when files are easyand simple, this function is really powerful.

```
array([[ 1.80000e+01,  6.20000e+01,  1.93200e+03],
       [ 2.30000e+01,  4.90000e+01, -4.66682e+05],
       [ 4.70000e+01,  5.20000e+01,  2.93158e+05],
       [ 5.10000e+01,  3.90000e+01, -3.27168e+05],
       [ 2.20000e+01,  3.80000e+01, -7.62248e+05]])
```

Fig: 5.2.1.2 Numpy. loadtxt function

5.2.2 MODULE-2: DATA PRE-PROCESSING

Data preprocessing is a step in the data mining and data analysis process that takes raw data and transforms it into a format that can be understood and analyzed by computers and machine learning. The aim of pre-processing is an improvement of the image data that suppresses unwilling distortions or enhances some image features important for further processing, although geometric transformations of images (e.g. rotation, scaling, translation) are classified among pre-processing methods here since similar ...

- Data Preprocessing Steps
- Data quality assessment.
- Data cleaning.
- Data transformation.
- Data reduction.

Data Preprocessing Steps

Let's take a look at the established steps you'll need to go through to make sure your data is successfully preprocessed.

- Data quality assessment
- Data cleaning
- Data transformation
- Data reduction

1. Data quality assessment

Take a good look at your data and get an idea of its overall quality, relevance to your project, and consistency. There are a number of data anomalies and inherent problems to look out for in almost any data set

2. Data cleaning

Data cleaning is the process of adding missing data and correcting, repairing, or removing incorrect or irrelevant data from a data set. Dating cleaning is the most important step of preprocessing because it will ensure that your data is ready to go for your downstream needs.

3. Data transformation

With data cleaning, we've already begun to modify our data, but data transformation will begin the process of turning the data into the proper format(s) you'll need for analysis and other downstream processes.

This generally happens in one or more of the below:

- Aggregation
- Normalization
- Feature selection

4. Data reduction

The more data you're working with, the harder it will be to analyze, even after cleaning and transforming it. Depending on your task at hand, you may actually have more data than you need. Especially when working with text analysis, much of regular human speech is superfluous or irrelevant to the needs of the researcher. Data reduction not only makes the analysis easier and more accurate, but cuts down on data storage.

5.2.3 MODULE-3: FEATURE EXTRACTION

Feature extraction is then applied to the windowed data to produce feature vector for recognition. Although sensor signals are oscillatory and prone to high fluctuation, they will still exhibit certain statistical behaviors. These behaviors have led many works to adopt statistical features from the time domain of the sensor signal. For example, mean, max, min, standard deviation (std), skewness, kurtosis , median absolute deviation (mad),

root mean square (rms), interquartile range (iqr) and spectral entropy have been utilized to form a statistical representation of the sensor signals. In order to handle the periodic signals in human activities, raw sensor signals are also transformed into the frequency domain by Discrete Fourier Transform (DFT) or Discrete Cosine Transform (DCT), anddifferent statistical features have been extracted, such as peak of DFT coefficients, energy, index of the largest frequency component, and signal power in different frequencybands.

5.2.4 MODULE-4: ACTIVITY RECOGNITION

Human-activity recognition across multivariate time-series data. Recently, CNNsare also deployed for human-activity recognition using HCI-HAR dataset. In this regard, a detailed analysis of evaluating the HCI-HAR dataset has been performed by using a range of machine learning architectures such as SVM, LSTM, BLSTM, MLP, and CNN [8]. In , authors have proved CNN as the best candidate for human activity recognition using the HCIHAR dataset In addition, CNN-RNN based architectures are taking fewer iterations (epochs) for convergence of model during training. Our deep learning model is inspired by the same techniques, such as we have deployed FCN-LSTM [5] (previously used for time-series classification) for human activity recognition by fine-tuning the kernel sizes and the number of kernels accordingly.

CHAPTER 6

TESTING

6.1 OVERVIEW ABOUT TESTING

Software testing is an investigation conducted to provide stakeholders with information about the quality of the software product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risk of software implementation. Test techniques include the process executing the program or application with the intent of finding software bugs(errors or other defects), and verifying that the software product is fit for use.

6.2 TYPES OF SOFTWARE TESTING:

6.2.1 White box testing

6.2.2 Black box testing

6.2.3 Unit Testing

6.2.4 Functional Testing

6.2.5 Performance Testing

6.2.6 Integration Testing

6.2.7 Validation Testing

6.2.8 System Testing

6.2.9 Structure Testing

6.2.10 Output Testing

6.2.11 User Acceptance Testing

6.2.1 WHITE BOX TESTING

White Box testing (also known as clear box testing, glass box testing, transparent box testing and structural testing) is a method of testing software that tests internal structures or workings of an application, as opposed to its functionality. In white box testing an internal perspective of the system as well as programming skills are used to design test cases. The tester chooses inputs to exercise paths through the code and determine the expected outputs. White box testing can be applied at the unit, integration and system levels of the testing process. Although traditional testers tended to think of white box testing as being done at the unit level, it is used for integration and system testing more frequently today. It can test paths within a unit, paths between units during integration and between subsystems during a system level test. Though this method of test design can uncover many errors or problems, it has the potential to miss unimplemented parts of the specification or missing requirements.

6.2.2 BLACK BOX TESTING

Black box testing is a method of software testing that examines the functionality of an application without peering into its internal structures or workings. This method of test can be applied virtually to every level of software testing like unit, integration, software, system and acceptance. It is sometimes referred to as specification based testing. Black box testing, also known as behavioural testing is a software testing method in which the internal structure design implementation of the item being tested is not known to the tester. These tests can be functional or non-functional, though usually functional.

6.2.3 UNIT TESTING

- Unit testing, also known as Module testing, focuses verification efforts on the module. The module is tested separately and this is carried out at the programming stage itself.
- Unit test comprises of the set of tests performed by an individual programmer before integration of the unit into the system.
- Unit test focuses on the smallest unit of software design the software component or module.
- Using component level design, important control paths are tested to uncover errors within the boundary of the module.
- Unit test is white box oriented and the step can be conducted in parallel for multiple components.

6.2.4 FUNCTIONAL TESTING

Functional testing is a type of software testing whereby the system is tested against the functional requirements specifications. Functions or features are tested by feeding them input and examining the output. Functional testing ensures that the requirements are properly satisfied by the application. This type of testing is not concerned with how processing occurs but rather with the results of processing. It simulates actual system usage but does not make any system structure assumptions. During functional testing, Black box testing technique is used in which the internal logic of the system being tested is not known to the tester. Functional testing is normally performed during the levels of system testing and acceptance testing.

Typically Functional testing involves the following steps:

Identify functions that the software is expected to perform.

Create input data based on the function’s specification.

Determine the output based on the function's specification.

Execute the test case.

Compare the actual and expected outputs.

6.2.5 PERFORMANCE TESTING

Performance testing is done to provide stakeholders with information about their application regarding speed, stability and scalability. More importantly, Performance testing uncovers what needs to be improved before the product goes to market. Without performance testing, software is likely to suffer from issues such as: running slow while several users use it simultaneously, inconsistencies across different operating systems and poor usability. Performance testing determines the amount of execution tine spent in various parts of the unit, program throughput and response time and device utilization of the program unit. It occurs throughout all steps in the testing process.

6.2.6 INTEGRATION TESTING

- It is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with in the interface.
- It takes the unit tested modules and builds a program structure.
- All the modules are combined and tested as a whole.
- Integration of all the components to form the entire system and a overall testing is executed.

6.2.7 VALIDATION TESTING

- Validation test succeeds when the software functions in a manner that can be reasonably by the client.
- Software validation is achieved through a series of black box testing which confirms to the requirements. The test is designed to uncover interface errors, is also used to demonstrate that software functions are operational, input is properly accepted, output are produced and the integrity of external information is maintained.

6.2.8 SYSTEM TESTING

System testing is testing conducted on a complete integrated system to evaluate the system's compliance with its specified requirements. System testing takes, as its input, all of the integrated components that have passed integration testing. Tests to find the discrepancies between the system and its original objective, current specification and system documentation.

6.2.9 STRUCTURAL TESTING

Structural testing is the type of testing carried out to test the structure of code. It is also known as testing or Glass box testing. This type of testing requires knowledge of the code, so it is mostly done by the developers. It is more concerned with how system does it rather than the functionality of the system. It provides more coverage to the testing. For example, to test certain error message in application, we need to test the trigger condition for it, but there must be many trigger for it. It is possible to miss out one while testing the requirements drafted in SRS. But using this testing, the trigger is most likely to be covered since structural testing aims to cover all the nodes and paths in the

structure of code. It is concerned with exercising the internal logic of a program and traversing particular execution paths.

6.2.10 OUTPUT TESTING

- Output of test cases compared with the expected results created during design of test cases.
- Asking the user about the format required by them tests the Output generated or displayed by the system under consideration.
- Here, the output format is considered into two was, one is on Screen and another one is printed format.
- The output on the screen is found to be correct as the format was designed in the system design phase according to user needs.
- The output comes out as the specified requirements as the user's hard copy.

6.2.11 USER ACCEPTANCE TESTING

- Final Stage, before handling over to the customer which is usually carried out by the customer where the test cases are executed with actual data.
- The system under consideration is tested for user acceptance and constantly keeping touch with the prospective system user at the time of developing and making changes whenever required.

It involves planning and execution of various types of test in order to demonstrate that the implemented software system satisfies the requirements stated in the requirement document.

Two set of acceptance test to be run:

1. Those developed by quality assurance group.
2. Those developed by customer.

CHAPTER 7

SCREENSHOTS

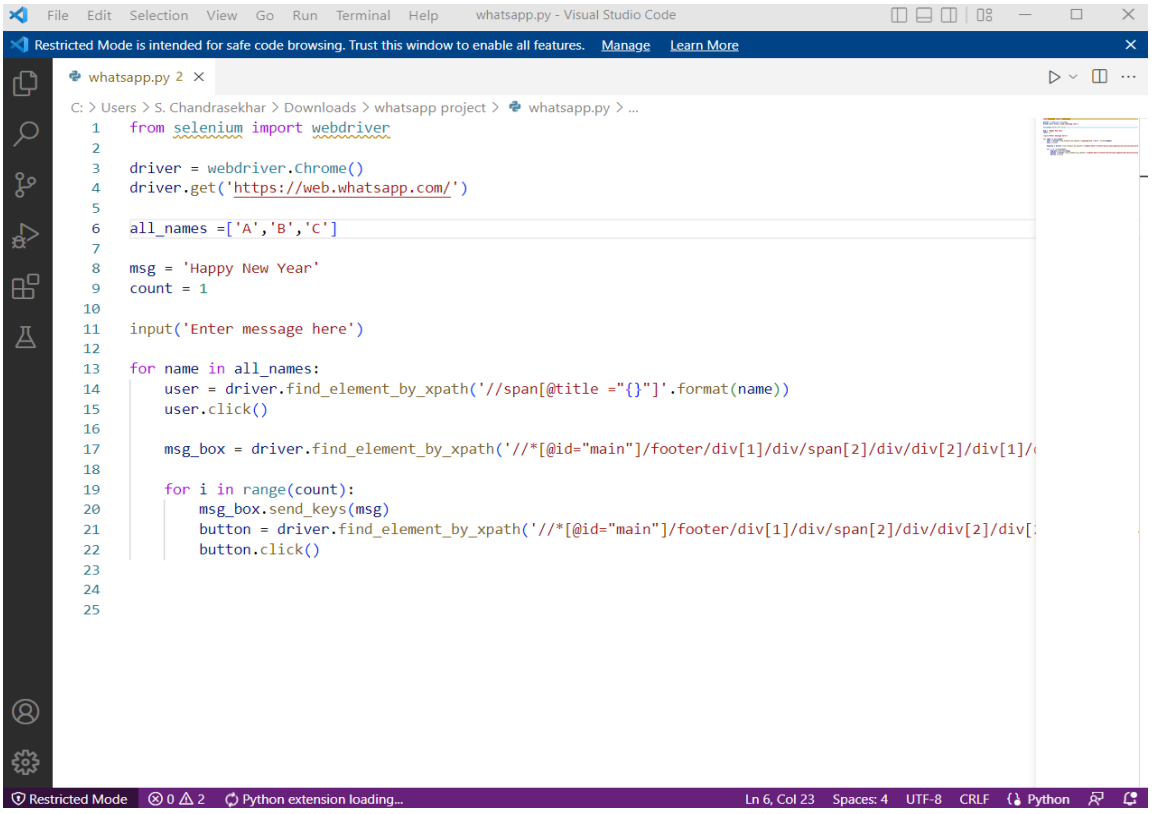

Fig: 7.1 Source code

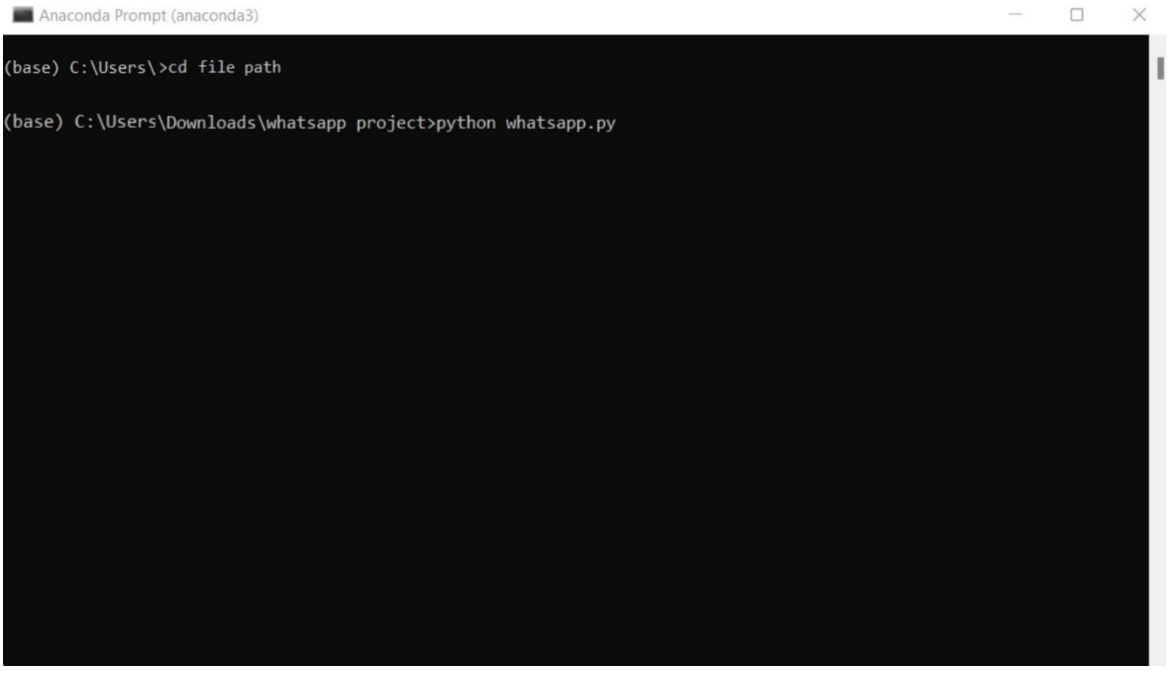

Fig: 7..2 Anaconda prompt access

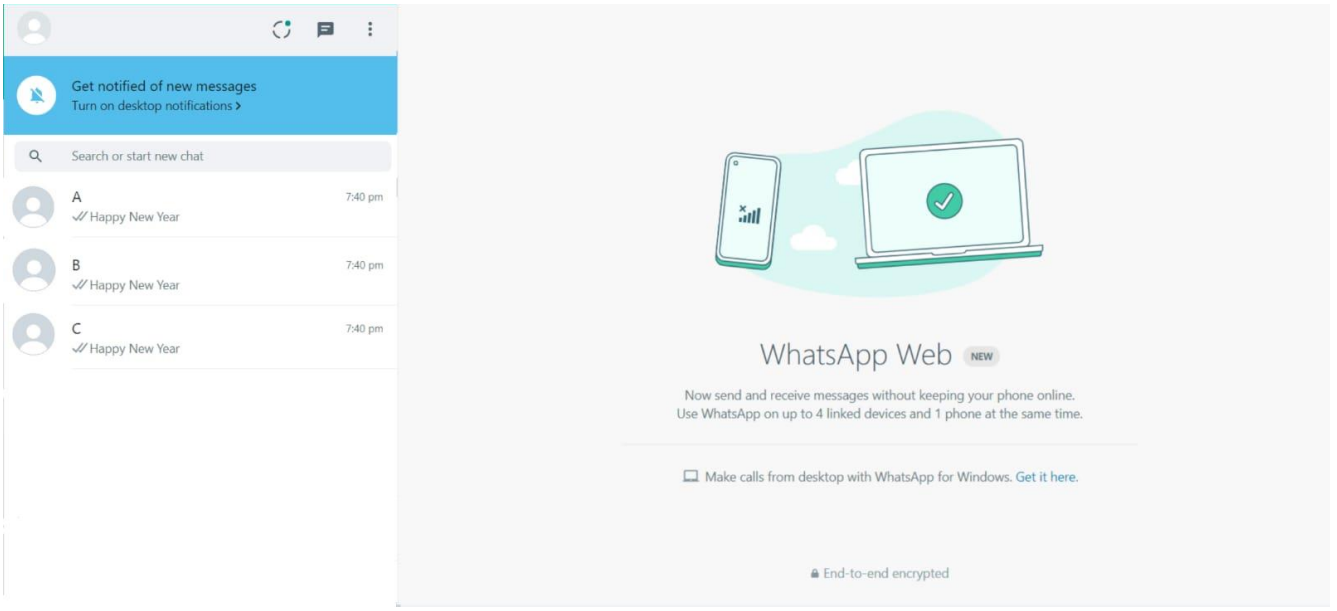

Fig: 7.3 Whatsapp automatic message sending

CHAPTER 8

CONCLUSION

Based on the analysis and the results of the experiment, a number of conclusions were drawn, including further areas of research. Nowadays, the popularity of messengers is growing, so it is important to automate processes and create bots. Using the web version of the messenger does not limit the bot's capabilities, so this method is working for creating bots created for private use. The file system used in the program works more stable, since the main code does not change. At the moment, the bot has great potential, since the main functions were written. You can make almost anything out of them. As the next task, you can add the number of commands to the bot, for example, display the weather forecast, or display the schedule of a TV channel. Thus, a bot was developed that allows you to automate the process of sending congratulations to relatives, and also has good potential for further work with WhatsApp.

FUTURE ENHANCEMENT

One of the main advantages of our WhatsApp automation tool is time-saving. You don't have to send each message to the group manually every time. It is enough to schedule the pre-written posts once a week, and POSTOPLAN will automaticallyrelease them.

Scheduling messages on WhatsApp will allow you always to get your Audience online. You don't have to wait for prime time to publish a post. Set the correct hour, and the service will make the release instead of you. This is especially useful if you and your clients live in different time zones.

Constantly keeping in touch with your audience through messages on WhatsApp will help you earn more money. Scheduled posts about new products and discounts will encourage customers to make purchases.

WhatsApp web automation will help increase your content quality since the posts created in advance and put on the deferred release are usually better than those written and published at the last moment.

CHAPTER 9

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CHAPTER 10

APPENDIX – Source code:

```
from selenium import webdriver


driver = webdriver.Chrome()

driver.get('https://web.whatsapp.com/')


all_names =['A','B']


msg = 'Happy New Year'

count = 1


input('Enter message here')


for name in all_names:

    user = driver.find_element_by_xpath('//span[@title ="{}"]'.format(name))

    user.click()


    msg_box =
driver.find_element_by_xpath('//*[@id="main"]/footer/div[1]/div/span[2]/div/div[2]/div[1]/div
/div[2]')


    for i in range(count):

        msg_box.send_keys(msg)

        button =
driver.find_element_by_xpath('//*[@id="main"]/footer/div[1]/div/span[2]/div/div[2]/div[2]/bu
tton/span')

        button.click()
```

APPENDIX – Base Paper:

Automation of Message Sending Processes Using Specialized Software

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***Abstract*— The article discusses a method for automating the sending congratulatory messages and images to relatives in the Whatsapp messenger using its web version "WhatsApp Web" due to the lack of an official api for creating bots. Also, a chat bot, which was written with python and can recognize and respond to commands, was implemented.**

Keywords—bot; whatsapp; python; selenium; automation.

I. INTRODUCTION

In the modern world, we often face the problem of lack of time. Each person has to do many different things every day. Therefore, sometimes people forget about the important thing: about maintaining a connection with their relatives. Indeed, it takes a significant amount of time to pay attention to everyone. Because of this, people rarely write to each other, and sometimes they completely forget to congratulate a loved one on an important holiday for him. To get rid of the daily time spent, it was decided to create a program that would send cards to relatives on holidays and could also interact with them using commands.

Within the framework of the article, the chatbot technology will be discussed in detail. A chatbot is a virtual interlocutor, a program designed to imitate human behavior when communicating with one or more interlocutors. To a greater extent, this trend is now being formed abroad - there are a huge number of bots for "WhatsApp", "FaceBook" or "Telegram", capable of solving a variety of tasks. Chriss Messina in article [1] called 2016 the year of dialogue or colloquial commerce. He believes there is a tendency to use instant messengers as a link between the user and large companies, with the result that business will be conducted through chats and instant messengers. Therefore, it is relevant to use a bot on Whatsapp. Also, according to data from article [2], most people over 36 do not use social networks, but use instant messengers to keep in touch with relatives and friends. The most popular social network "Ok.ru" among people of this age category has 22% of all users, while in the messenger "WhatsApp" this figure is 40%.

Bots in the WhatsApp messenger are nothing new. Although they are used less frequently than in other applications, they are convenient tools for business. BotCreators' articles say that bots on WhatsApp are different from other bots. Because of this, their implementation is more difficult, but bots turn out to be complete with the right approach [3].

When analyzing already existing user projects on the Github.com site, it was discovered that there are bots that perform various functions. But no bots were found to send messages based on date and time.

II. RESEARCH MATERIALS AND METHODS

Since the messenger does not have an official api for writing bots, such as "VK Api" or "Telegram Api", it was impossible to work with "Whatsapp" itself, so it was decided to manage its web version. There are different tools for managing "Whatsapp" web. The most popular of these are "Twilio" and "selenium". "Twilio" is a platform that, with a paid subscription, provides the user with access to the "WhatsApp Business API", which has ready-made implementations of basic tasks for working with the messenger. It was decided that the cost of a paid subscription was unacceptable as the bot would be used for private use rather than running a business that would justify the cost. Therefore, selenium was chosen as a tool for implementing the bot. It can be used to automate a web browser by imitating human actions on a web page. This tool reads the page code, finds elements, and interacts with them in a specific way. The principle of dividing a page into objects and managing them became the main principle in creating a bot. Thanks to this approach, it became possible to write a program that would be fully automated and controlled by the user through the input line, without the need to correct the program code.

First, the basic functions necessary for the bot were implemented, such as: sending messages, sending images, adding a new chat, reading the latest messages. Let us consider the principle of work on the implementation of one of the simplest functions - sending a message.

```
message_box = driver.find_element_by_xpath('//div[@class="_3uMse"]')
message_box.send_keys(mesname)
send_button = driver.find_element_by_xpath('//button[@class="_2Ujuu"]')
send_button.click()
```

Fig 1. The code of sending a message

With the help of selenium, the program Fig. 1 finds the message_box element at a special address called xpath and enters the message text in the misname parameter, then searches for the button at its unique xpath address and simulates the button click.

Based on the basic functions, many others were subsequently written that were used to write the bot program. To do so, the algorithm below was developed, allowing you to understand how the program works.

1. First, the program launches the Google Chrome browser, opens a tab with WhatsApp Web in it, then it waits for the final page to load. Along with this, a new Thread is also created, which allows several tasks to be performed simultaneously in one program. This stream every minute writes the current time to a certain object, and if it coincides with the time for sending congratulations, then it writes a certain value to a special counter. Thus, it acts as a clock.

2. After loading the page, the program starts the main cycle, consisting of several checks, the algorithm of which is presented below in the form of a block diagram Fig. 2.

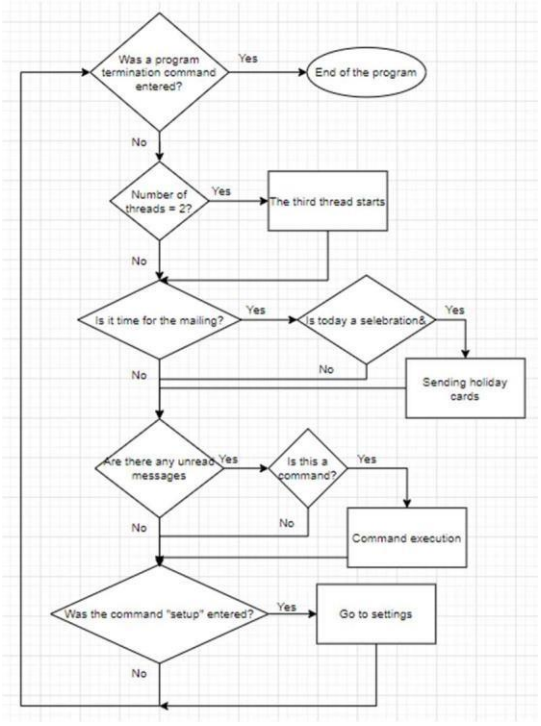

Fig 2. Block diagram

3. At the beginning of the cycle, it checks how many threads are running at that moment. If their number is 2, then a third thread is launched, which checks whether the setup command has been entered. If it was entered, then the program fills the counter, which is then checked in step 6, then the flow ceases to exist. Otherwise, the program will continue to wait for the command. In this case, there will be 3 threads in the program, and the loop will not start new threads.

4. Then the counter is checked, which is described in point 1. If the value matches a certain one, then the program searches the database for a holiday on that day. If there is a holiday, then greeting cards are sent. In all other cases, the program proceeds to the next stage. Since the holidays are different, it is worth considering who the program will congratulate on this day, because it is incorrect to send a postcard of a women's holiday to a man. To do this, it was decided to add to the program the ability to send a picture only to a specific group specified in the group column of a special file, in which the user manually assigns each holiday a corresponding group for which there is a ".txt" file that lists contacts for sending a postcard.

TABLE 1. CELEBRATIONS

number	*date*	*name*	*group*
0	01-01	Friday	all_users
1	01-02	Weekends	all_users
2	01-03	Commemoration day of saint Peter	group1
3	01-06	Christmas eve	group1
4	01-07	Christmas	all_users
5	01-08	Cathedral of the Holy Bagaroditsa	group1
6	01-11	International Day of "thank you"	group1
7	01-12	Day of the employee of the prosecutor's office of Russia	group2

5. The program checks the code of the web page for special objects that appear only when the user has unread messages. If there are such objects, the program opens a chat with this user and reads the text of the unread message. If this text is a command, then it is executed. In any other cases, the program proceeds to the next stage in the algorithm.

6. The program checks if the counter mentioned in point 3 is full. If the counter takes a certain value, then the program goes to the settings, where the user can change and add some program components.

Thus, the main loop runs until the user manually completes the execution of the program. To do this, he must enter setup in the command line, go to the settings and select the appropriate item there.

Since one of the main goals of the bot is to maintain contact with relatives by sending congratulations, it was decided to add as many holidays as possible to the database in order to pay attention to relatives almost every day. This requires a large database of holidays. It would be very difficult to search and process so much data manually. Moreover, some holidays do not have a specific date, and therefore it may change every year. Because of all this, it was decided to write parser programs that would automatically record all holidays in a certain file, and also download pictures for each of them. Among the many parsing tools, a Python package for parsing html documents called Beautiful Soup was chosen. It breaks the html file into objects and knows how to process them and get information from them. It is convenient to work with web pages with its help. A website specializing in greeting cards was selected to expand the database. Thanks to this feature, the site had an easy-to-use structure, as well as a calendar of all holidays. Also, each of them was necessarily accompanied by images with congratulations, which could be downloaded from the same page. The written parser program allows you to get a complete list of all holidays for the year and download a greeting card for each of them in just one execution of the program.

In addition to automatic congratulations, it was decided to add a command recognition function to realize the huge potential

of the bot. A function was written that recognizes the command "meme" and sends the sender of the command a funny picture or anecdote in the form of a picture. Here, just like with the holidays, a large database of funny pictures was required. But choosing funny pictures is a serious task, because there is too much adult humor on specialized sites that does not fit the criterion "for the whole family." Therefore, each of the pictures must go through censorship in order to weed out indecent or inappropriate pictures and not disgrace themselves in front of relatives. Manual verification of each image would take a lot of time, so it was decided to parse images not from specialized sites, but from the “Ok.ru” social network. However, when working with it, difficulties arose, since the site was constantly changing the html code, and Beautiful Soup only works with static codes. The problem was fixed with the help of selenium, which first scrolled the “Ok.ru” feed, making objects that were not visible before appeared, and then copied the html code of the page and sent it to Beautiful Soup for processing. After that, the parsing of the site did not bring unforeseen difficulties.

III. Results

As a result, the whatsapp bot was implemented in the form of several files: the whatsappbot.py file containing the main bot program, the parsedays.py file containing the holiday parsing program, the parsememes.py file for parsing sites into funny pictures. To start working with the bot, you should run both parsers so that they create the folders necessary for the bot to work, and the user is also required to correctly use the files created by the program in order to prevent errors in work. The bot works using the methods given above and is able to automatically send congratulations to specific chats, as well as recognize commands and execute them, moreover, it supports the ability to go to the bot settings by entering setup in the command line, where you can configure the mailing time, edit new lists, and also exit the program

So that the user does not have to make changes to the code when working with the bot, it was decided to use the file system. Thanks to this, it was possible to make it so that the user can create as many different groups as he wants. This feature is implemented as follows. First, the user must manually assign each holiday a group in table 1, he can choose any name. Then he must create a text file with the same name and enter the names of the contacts, each with a new line. When the program performs this function, it will perform actions presented in the algorithm in the form of a block diagram Fig. 4.

Thus, all user-dependent parameters were written to a file, which made it possible to change the data directly while the program was running. With this approach, the probability of an error in the program when trying to update the data is greatly reduced. In addition, with competent writing of files during parsing, you can conveniently use all the data received

At this stage, the developed program is complete. So, it can be used in its current form and correctly perform the assigned tasks. In addition, the functions described in it can become the basis for creating other bots. Thus, the program can be viewed as a library of functions for working with “WhatsApp Web”.

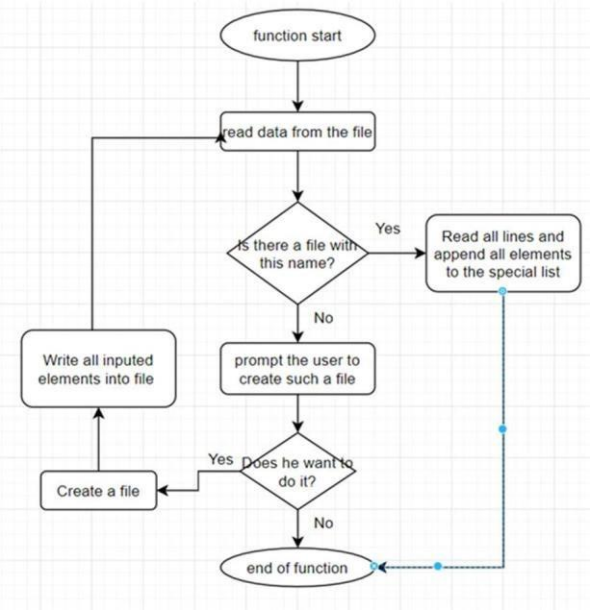

Fig. 4 – Choose users

You can get acquainted with the code at the link on github: https://github.com/RachUwU/Project-practice

IV. Discussion And Conclusions

Based on the analysis and the results of the experiment, a number of conclusions were drawn, including further areas of research.

1. Nowadays, the popularity of messengers is growing, so it is important to automate processes and create bots.
2. Using the web version of the messenger does not limit the bot's capabilities, so this method is working for creating bots created for private use.
3. The file system used in the program works more stable, since the main code does not change.
4. At the moment, the bot has great potential, since the main functions were written. You can make almost anything out of them. As the next task, you can add the number of commands to the bot, for example, display the weather forecast, or display the schedule of a TV channel.

Thus, a bot was developed that allows you to automate the process of sending congratulations to relatives, and also has good potential for further work with WhatsApp.

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