

**A Socially Relevant Project Report Submitted to**  
**Jawaharlal Nehru Technological University-A Anantapur**

*In partial fulfilment of the requirements*  
*For the Award of the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE ENGINEERING**

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**K.S.R.M. COLLEGE OF ENGINEERING**  
(AUTONOMOUS)

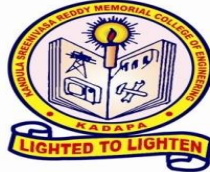
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Kadapa, Andhra Pradesh, India– 516 003  
(2020-2021)

# **K.S.R.M. COLLEGE OF ENGINEERING**

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(Accredited by NAAC, BANGLORE)  
Kadapa, Andhra Pradesh, India- 516 003

## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



## **CERTIFICATE**

Certified that this is a Bonafede record of the socially relevant project report entitled, “**VOICE BASED EMAIL FOR BLIND**”, done by

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Submitted to the department of Computer Science and Engineering, in partial fulfilment of the requirements for the Degree of **BACHELOR OF TECHNOLOGY** in **Computer Science and Engineering** from Jawaharlal Nehru Technological University-A, Anantapur during the year of **2020-2021**.

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I express my sincere thanks to my guide, **Dr. B. VENKATA RAMANA REDDY**, professor, Department of CSE, who offered many comments and insights that depended on my understanding of project and its context.

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## **ABSTRACT**

In today's world, communication has become very easy due to integration of communication technologies with internet. However, the visually challenged people find it very difficult to utilize this technology because using it requires visual perception.

Even though much advancement has been implemented to help them use computers efficiently, no user who is visually challenged can use this technology as efficiently as a normal user since they require some practice for using the available technologies.

This project aims at developing an email system that will help even a naïve, visually impaired person to use the services for communication without previous training. The system does not require the use of keyboard. Instead, it will work only on Only by speech input. This system can also be used by any normal person, for instance, by someone who is unable to read.

The system is completely based on interactive voice response which will make it user friendly and efficient to u

## LIST OF FIGURES

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- Existing system vs Progressive system

## INTRODUCTION

Internet is considered as a major storehouse of information in today's world. No single work can be done without the help of it. It has even become one of the de facto methods used in communication. And out of all methods available email is one of the most common forms of communication especially in the business world. However not all people can use the internet. This is because in order to access the internet you would

need to know what is written on the screen. If that is not visible it is of no use. This makes internet a completely useless technology for the visually impaired and illiterate people.

Even the systems that are available currently like the screen readers **TTS** (Text to Speech) and **ASR** (Automatic Speech Recognition) do not provide full efficiency to the blind people to use the internet. As nearly 285 million people worldwide are estimated visually impaired it become necessary to make internet facilities for communication usable for them also.

Therefore, we have come up with this project in which we will be developing a voice-based email system which will aid the visually impaired people who are naive to computer systems to use email facilities in a hassle-free manner. The users of this system would not need to have any basic information regarding keyboard shortcuts or where the keys are located. All functions are based on simple Voice input itself making it very easy for any type of user to use this system.

This project is a prototype application for a standalone user which works on all the system having

Python 2.7above installed.

### 1.1 Project objectives:

This project proposes a python-based application, designed specifically for visually impaired People. This application provides a voice-based mailing service where they could read and Send mail on their own, without any guidance through their g-mail accounts. Here, the users Have to use certain keywords which will perform certain actions for e.g., Read, Send, Compose Mail etc. The VMAIL system can be used by a blind person to access mails easily and adeptly. Hence dependence of visually challenged on other individual for their activities Associated to mail can be condensed.



The application will be a python-based application for visually challenge persons using IVR- Interactive voice response, thus sanctioning everyone to control their mail accounts Using their voice only and to be able to read, send, and perform all the other useful tasks. The System will ask the user with voice commands to perform certain action and the user will Respond to it. The main advantage of this system is that use of keyboard is Eliminated, the user will have to respond through voice only.

## **1.2 Interactive Voice Response (IVR):**

Interactive voice response (IVR) is a technology that allows a computer to interact with humans using voice input via a keypad.

In telecommunications, IVR allows customers to interact with a company's host system via a telephone keypad or by speech recognition, after which services can be inquired about through the IVR dialogue.

IVR systems can respond with pre-recorded or dynamically generated audio to further direct users on how to proceed. IVR systems deployed in the network are sized to handle large call volumes and used for outbound calling, as IVR systems are more intelligent than many predictive dialer systems.

Another technology which can be used is using text to speech to talk advanced and dynamic data, such as e-mails, reports and news and data about weather.

IVR used in automobile systems for easy operations too. Text To Speech is system originated synthesized speech that's not the robotic voice historically related to computer. Original voices produce the speech in portions that are joined together and rounded before played to the caller.

### **1.3 Speech recognition:**

**Speech recognition**, the ability of devices to respond to spoken commands. Speech recognition enables hands-free control of various devices and equipment (a particular boon to many disabled persons), provides input to automatic translation, and creates print-ready dictation. Among the earliest applications for Speech recognition were automated Telephone systems and medical dictation Software. It is frequently used for dictation, for querying Database, and for giving commands to Computer -based systems, especially in professions that rely on specialized vocabularies. It also enables personal assistants in vehicles and Smartphones.

Speech recognition is the process by which a computer (or other type of machine) identifies spoken words. Basically, it means talking to your computer, AND having it correctly recognize what you are saying.

### **1.4 Speech to Text:**

**Speech-to-text** software is a type of software that effectively takes audio content and transcribes it into written words in a word processor or other display destination. This type of speech recognition software is

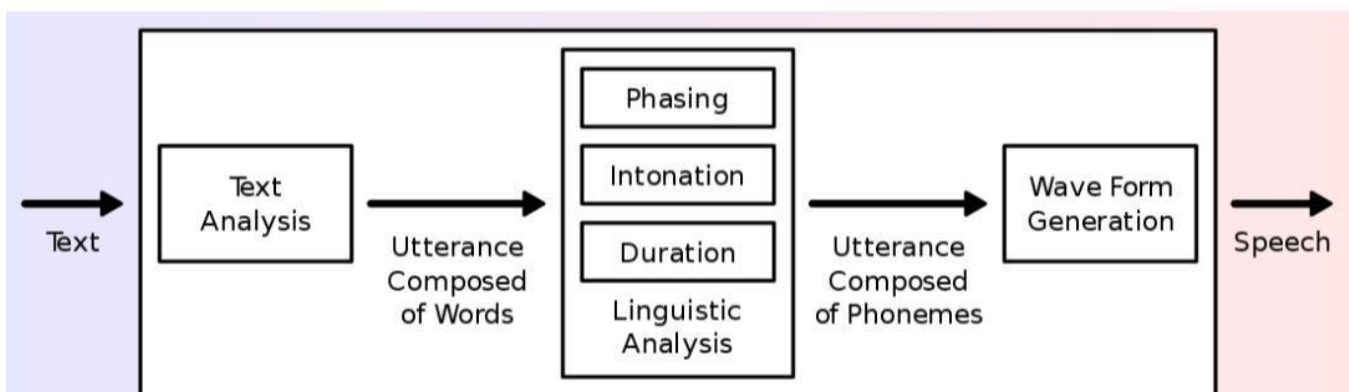
extremely valuable to anyone who needs to generate a lot of written content without a lot of manual typing. It is also useful for people with disabilities that make it difficult for them to use a keyboard. Speech-to-text software may also be known as voice recognition software.

## 1.5 Text to Speech:

A **text-to-speech (TTS)** system converts normal language text into speech; other systems render symbolic linguistic representations like phonetic transcriptions into speech.

Text-to-speech is the generation of synthesized speech from text. The technology is used to communicate with users when reading a screen is either not possible or inconvenient. This not only opens up applications and information to be used in new ways, but also has the ability to make the world a more accessible place to individuals who are unable to read text on a screen.

### Working of Text to Speech



## PROBLEM DEFINITION

We aim to overcome the shortcomings of the existing system in making the user completely independent with our proposed system.

Email is an essential part of modern life, but for the blind and visually impaired community, receiving emails can be very difficult.

The blind and visual impaired people are facing difficulties while using an email such as they have taken any others help to send mail or to read mails, and they face difficulties while using keyboard operations. They won't interact with web-based applications also.

This project is proposed for the betterment of society. This project aims to help the visually impaired people to be a part of growing digital India by using internet and aims to make life of such people quite easy. Also, the success of this project will also encourage developers to build something more useful for visually impaired or illiterate people, who also deserves an equal standard in society.

By this project we can send mails without any efforts or by not using any keyboard operations. Just by voice input or commands we can perform the operations like **signup/ login/ send mail / read unseen mails**

## EXISTING SYSTEM

There are 4.1 billion email accounts created until 2014 and there will be estimated 5.2 billion accounts by end of 2018. This makes emails the most common form of communication. The most common mail There are 4.1 billion email accounts created until 2014 and there will be estimated 5.2 billion accounts by end of 2018. This makes emails the most common form of communication. The most common mail services that we use in our day-to-day life cannot be used by visually challenged people because they

do not provide any facility so that the person in front can hear out the content of the screen, as they cannot visualize what is already present on screen they cannot make out where to click in order to perform the required operations.

For a visually challenged person using a computer for the first time is not that convenient as it is for a normal user even though it is user friendly. Although there are screen readers available still these people face minor difficulties. Screen readers read out whatever content is there on the screen and to perform those actions the person will have to use keyboard shortcuts as mouse location cannot be traced by the screen readers.

A user is new to computer can therefore not use this service as they are not aware of the key locations that we use in our day-to-day life cannot be used by visually challenged people because they do not provide any facility so that the person in front can hear out the content of the screen, as they cannot visualize what is already present on screen they cannot make out where to click in order to perform the required operations.

## **3.1 DISADVANTAGES OF EXISTING SYSTEM**

- ✚ Use of screen readers makes it difficult for blind person to access E-mail system as screen readers cannot trace the location of mouse pointer.
- ✚ Existing systems require basic information about keyboard shortcuts and where the keys on a keyboard are located.
- ✚ It can only Use by visible people.
- ✚ It is totally based upon keyboard and mouse operations.

## PROPOSED SYSTEM

The system that we are proposing is based on a completely innovative idea and is nowhere like the existing emails systems. Any technology can be considered beneficial if it can be accessed by all types of people.

The existing mail systems do not provide any such facilities by which a visually impaired person can have access to them.

Thus, the system that we are developing is entirely different from the existing one.

This is an application that will be completely based on "voice" or "speech". The user will be able to give commands to the system, which, the system will follow.

Moreover, the system will prompt the user to perform specific actions to avail respective services. The application will be accessible on all based devices and will be voice controlled.

In this system mainly three types of technologies are used namely:

**STT (Speech-to-text):** here whatever we speak is converted to text. There will be a small icon of a mic on which, when the user clicks, the user has to speak and his/her speech will be converted to text format, which the blind people would see and read also.

**TTS (text-to-speech)** this method is full opposite of STT. In this method, which converts the text format of the emails to synthesized speech.

**IVR (Interactive voice response):** IVR is an advanced technology that describes the interaction between the user and the system in the way of responding by using keyboard for the respective voice message.

IVR allows user to interact with an email host system via a system keyboard, after that user can easily service their own enquiries by listening to the IVR dialogue. IVR systems generally respond with pre-recorded

This system is currently developed by us. In which it first asks to sign in or login. If we have already an account, we can directly login by giving voice commands. In which It directly gets Logging Into account.

And once it is logged in and it directly goes to options like send mail and read mails. Here we can perform what we want to do. It only depends upon voice input only.

And those who cannot read need not to worry because as they can listen the prompting done by system.

## **4.1 MODULES**

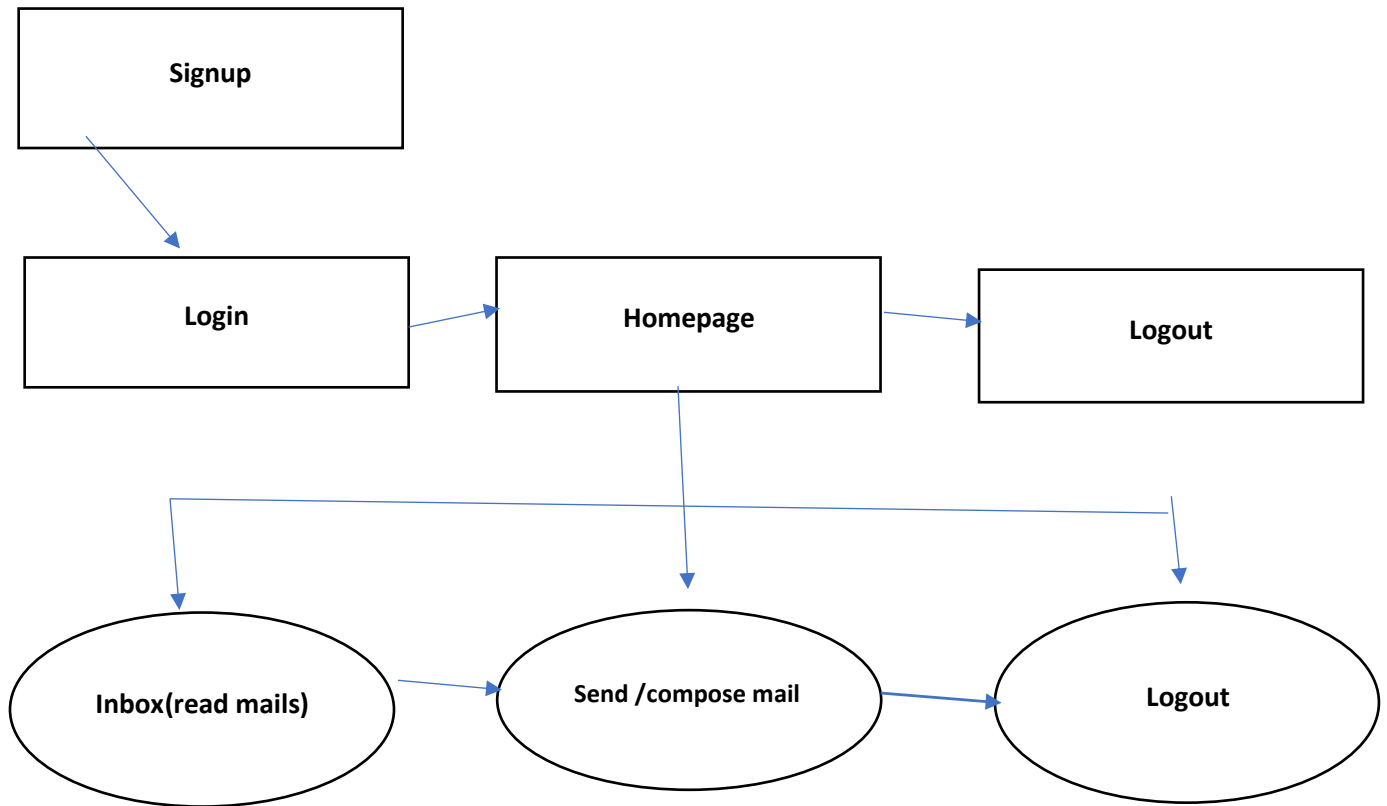
To login to the account, the user needs to provide the specified username and password. Once the user authentication is done, he will be directed to the home page. If he is a new user, then he needs to sign up to the mail account by providing his details and registering to it. When the user wants to compose the message to be sent, he needs to record the message using a microphone and then the mail will be

sent. The user can read all the mails he has received in the 'inbox' module.

- I. Sign up
- II. Login
- III. Send email
- IV. Read inbox
- V. Logout



## Block diagram of modules



## 4.2 ADVANTAGES OF PROPOSED SYSTEM

- This system makes the disabled people feel like a normal user.
- They can hear the recently received mails
- Without use of keyboard they can send the mail
- It is a user-friendly system
- Easy to access

- This desktop application can be easily and efficiently used by the visually challenged people.
- The individuals having typing problems can also take advantage of this system.

### ✚ Existing system vs progressive system

Existing system	Progressive system
<ul style="list-style-type: none"><li>• Less security</li></ul>	<ul style="list-style-type: none"><li>• High security</li></ul>
<ul style="list-style-type: none"><li>• Entire process is depending on keyboard Operations</li></ul>	<ul style="list-style-type: none"><li>• Entire process is depending on Interactive voice response</li></ul>
<ul style="list-style-type: none"><li>• Slow processing</li></ul>	<ul style="list-style-type: none"><li>• Faster and more efficient</li></ul>
<ul style="list-style-type: none"><li>• The Disables cannot use normal mail system</li></ul>	<ul style="list-style-type: none"><li>• The disables can use normal mail system</li></ul>
<ul style="list-style-type: none"><li>• Disables cannot interact with email system</li></ul>	<ul style="list-style-type: none"><li>• Disables can interact with mail system</li></ul>

## SYSTEM REQUIRMENTS

### SOFTWARE REQUIRMENTS are:

- **Tools used**

Python Idle

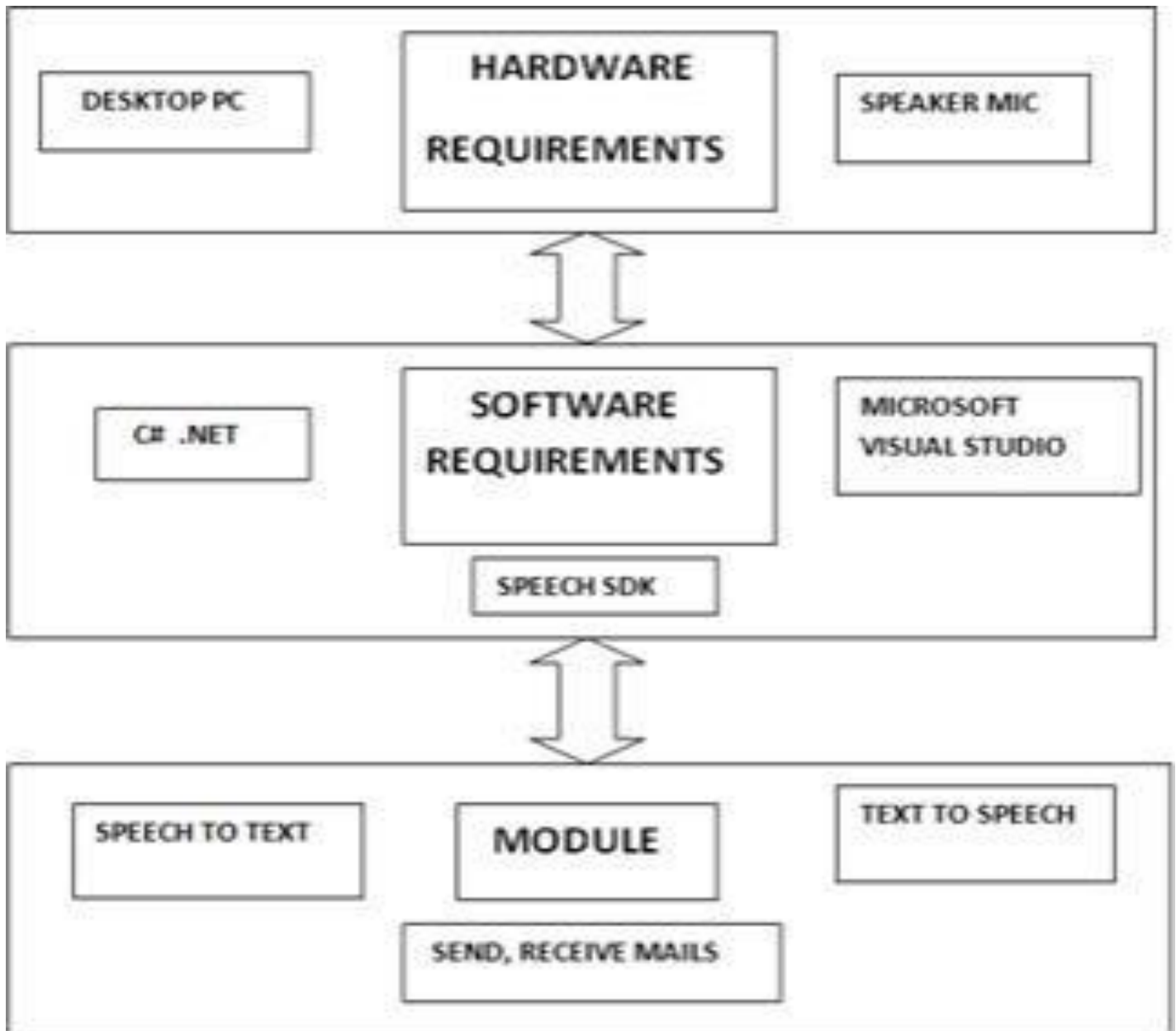
Requirements: windows (all versions)

Google speech to text and text to speech converter

**HARDWARE REQUIRMENTS are:**

headphones with microphone jack

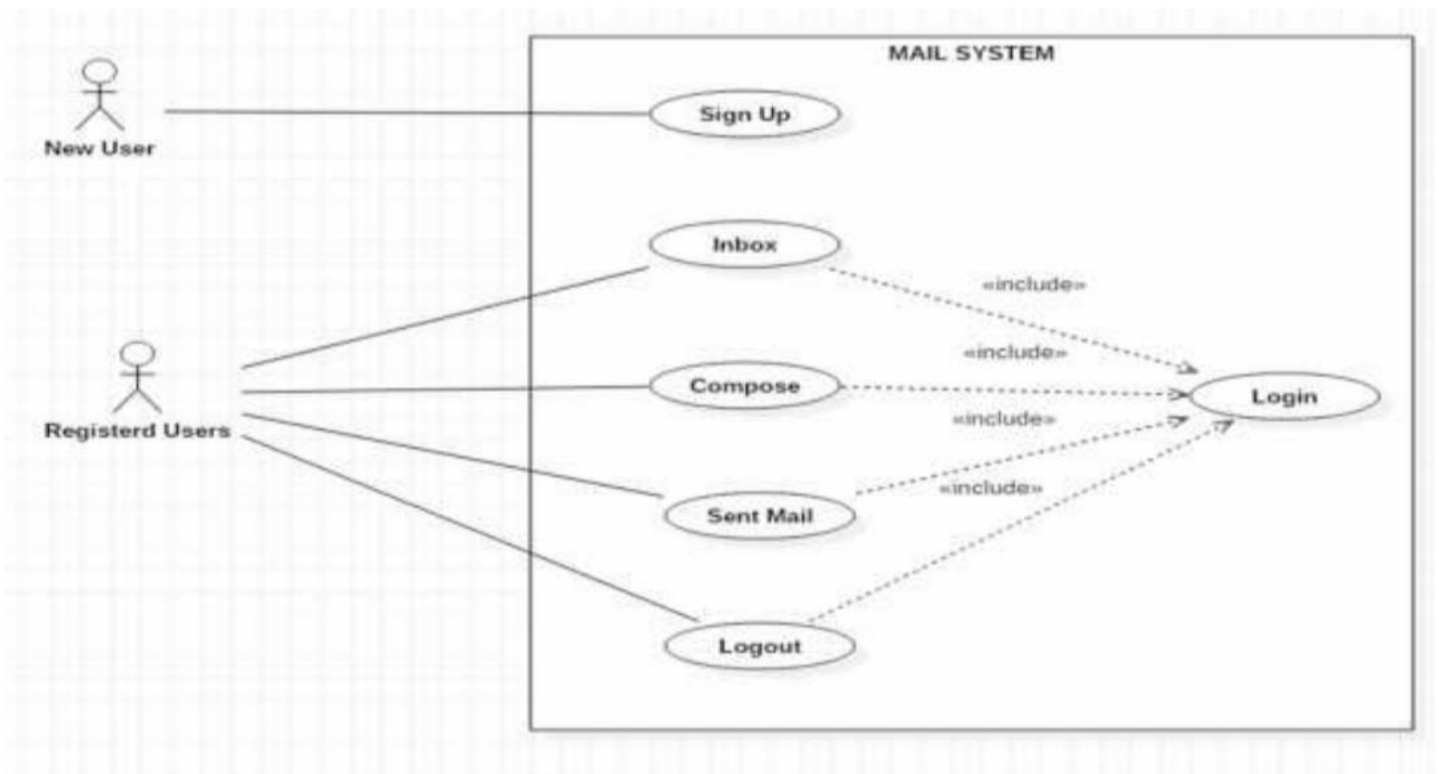
**SYSTEM ARCHITECTURE**



## Use case of mail system

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use

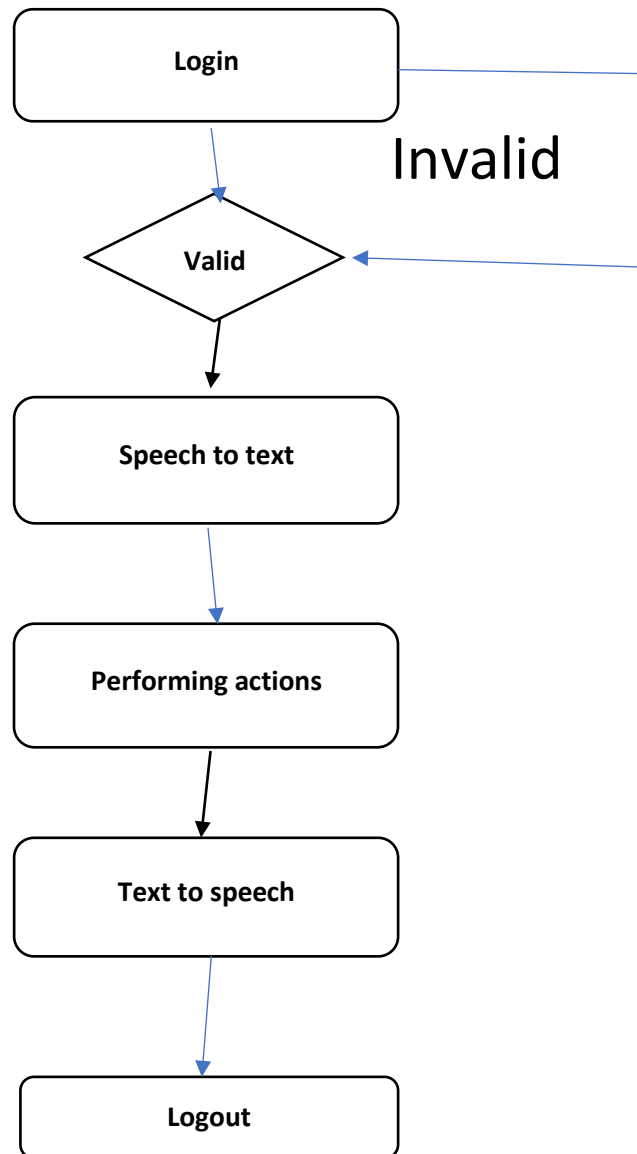
case. A use case diagram can portray the different types of users of a system and various ways that they interact with the system.



## ACTIVITY DIAGRAM

Activity diagrams are graphical representation of workflows of stepwise activities and actions with support for choice, iteration and concurrency.

This process is only done by the voice inputs or commands. It is useful especially for blinds and people who cannot type or not able to read.



## IMPLEMENTATION

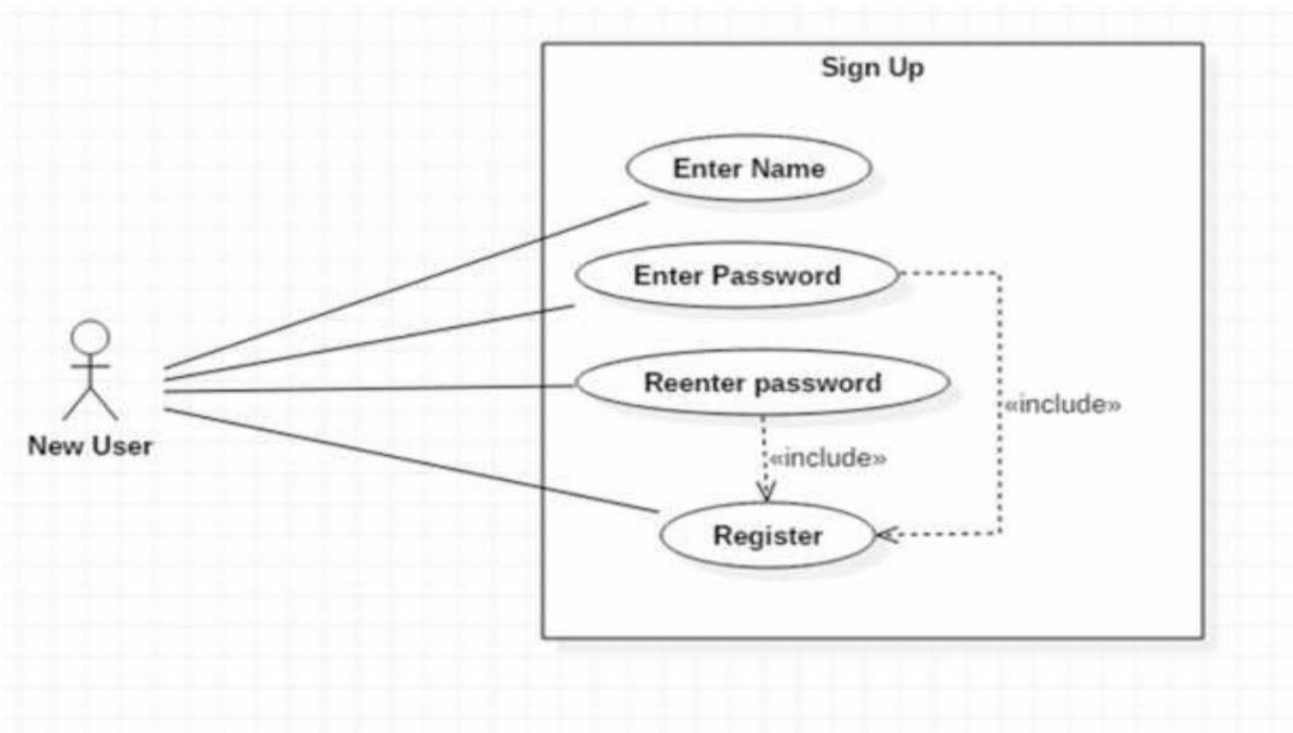
*The system developed by us includes following modules as follows:*

### A. SIGN UP:

This is the first module of the system. Any user who wishes to use the system should first register to obtain username and password. This module will collect complete information of the user by prompting the user as to what details needs to be entered. The user will need to speak up the details to which the system will again confirm by prompting

alphabetically. If the information is not correct user can re-enter else the prompt will specify the operation to be performed to confirm.

## Use case of signup

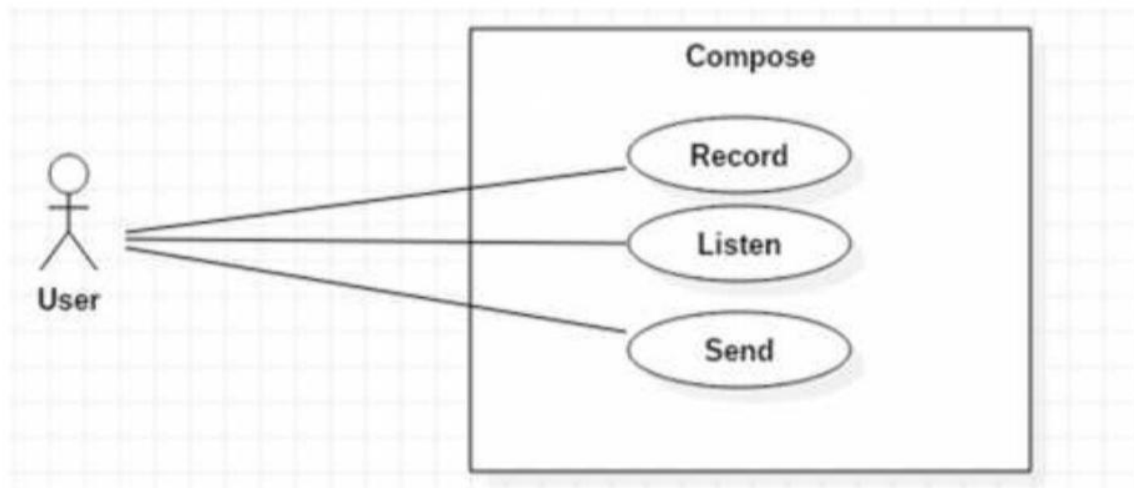


### B. LOGIN:

This is the second module of system. Once the registration is done the user can login to the system. Login module will ask user to provide username and password. Here the process goes in speech to text conversation of user. User is told to validate whether he/she entered details are correct or not. If the details are correct, then the user is authorized and will enter to the main page. **C. SEND MAIL/COMPOSE MAIL:**

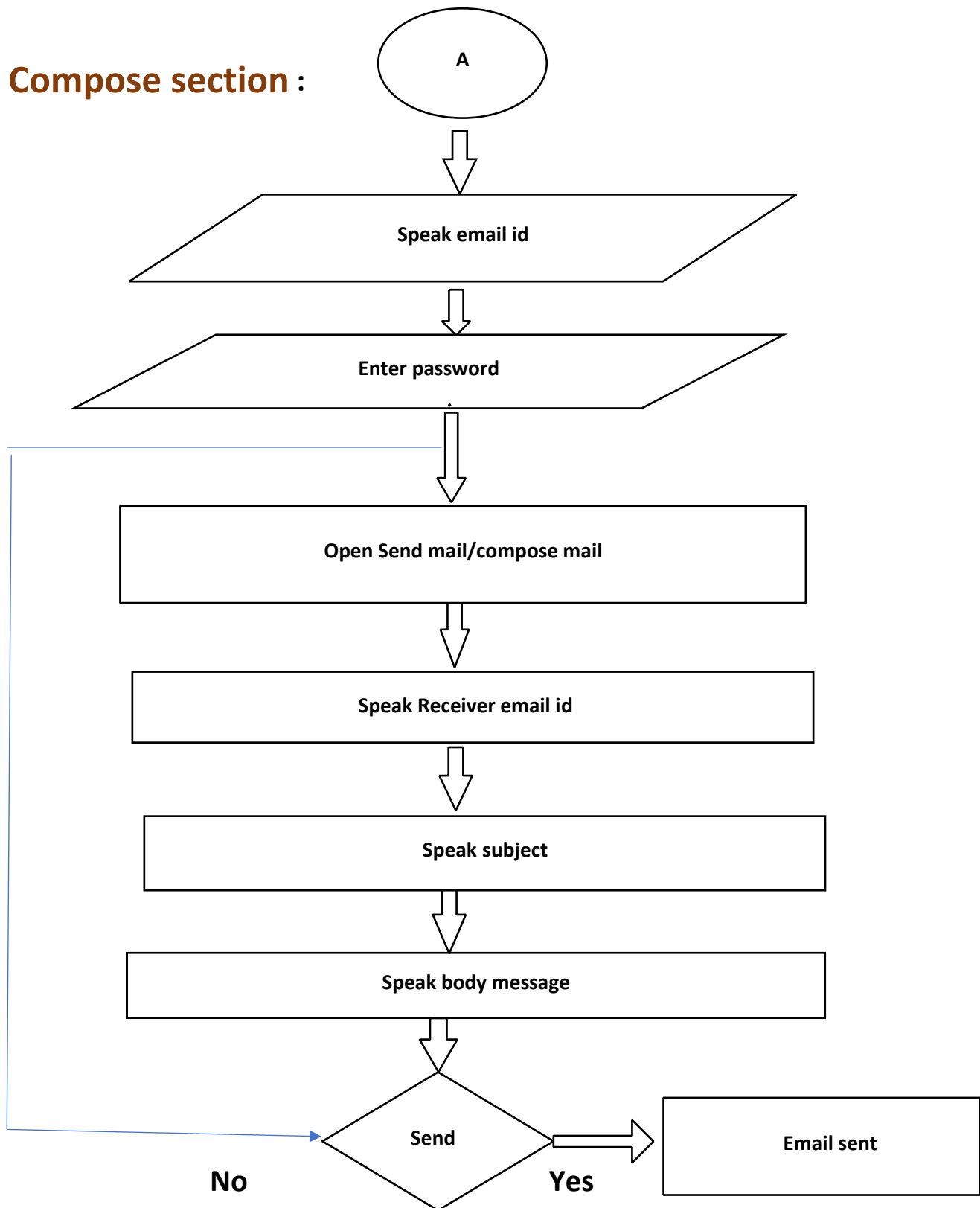
This is one of the most important options provided by the mail services. The functionality of compose mail option would not match the already existing mail system. Since the system is for visually challenged

people and keyboard operations are completely avoided composing mail would only be done on voice input. No typed input will be required. User can directly record message that needs to be propagated and can send it. This voice message will go in form of attachment. The receiver can hear the recording and get the message user wanted to send. User would not require attaching the file. Record option will be provided in the compose window itself. Once recorded it will confirm whether the recording is perfect or not by letting the user hear it and if the user confirms it will be automatically attached to the mail **Use case of compose mail:**





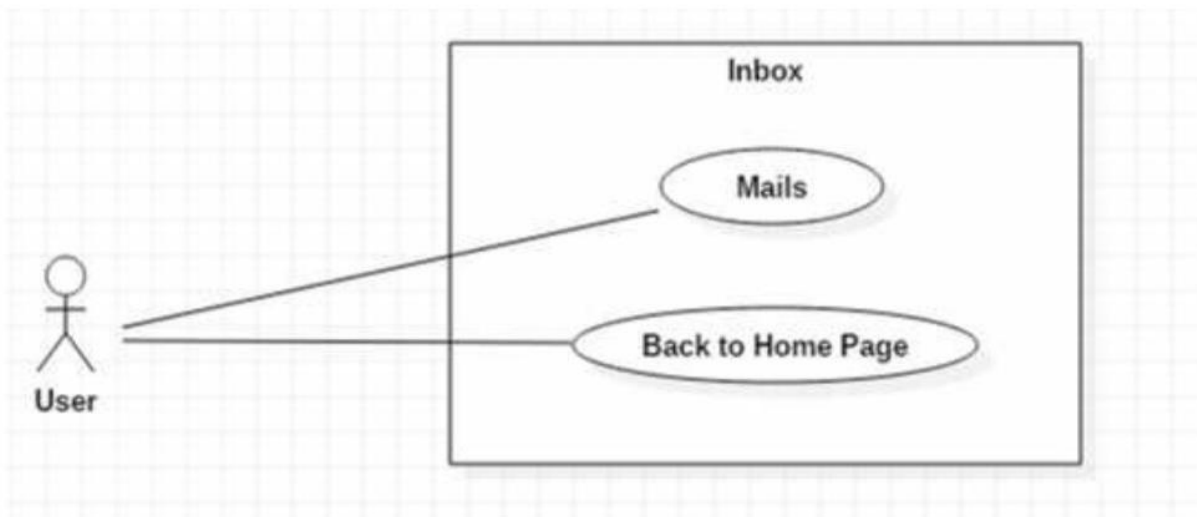
## Compose section :



## D. INBOX:

This option helps the user view all the mails that has been received to his/her account. The user can listen to mails he/she wants to be performing the click operation specified by the prompt. In order to navigate through different mails prompt will specify which operations to perform. Each time the mail is selected the user will be prompted as whom the sender is and what is the subject of that mail

### *Use case of inbox*



Finally, when the user is done with the application, he can logout of it from the home page, by speaking the command “**Logout**” the application will detect it and will logout the user.

## OUTPUT SCREENS

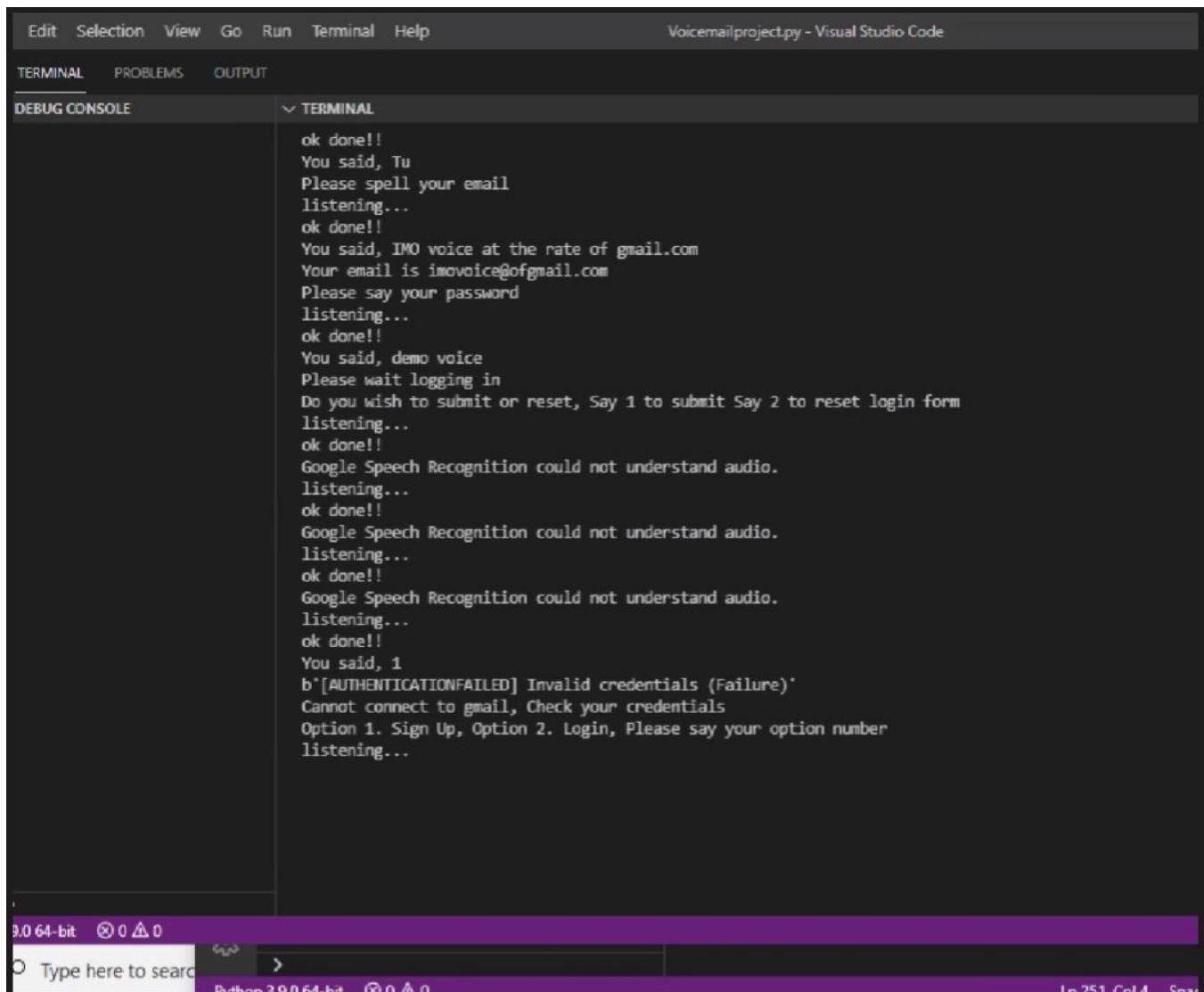
### Signup:

```
Option 1. Sign Up, Option 2. Login, Please say your option number
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, option one
Please say your full name
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, Gautami
Please spell your email
listening...
ok done!!
You said, a great gmail.com
Your email is agreatgmail.com
Please say your password
listening...
ok done!!
You said, 123
Do you wish to submit or reset, Say 1 to submit Say 2 to reset signup form
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, 1
Account registered successfully, Returning back to main menu
Option 1. Sign Up, Option 2. Login, Please say your option number
listening...
ok done!!
```

Fig : registration successful

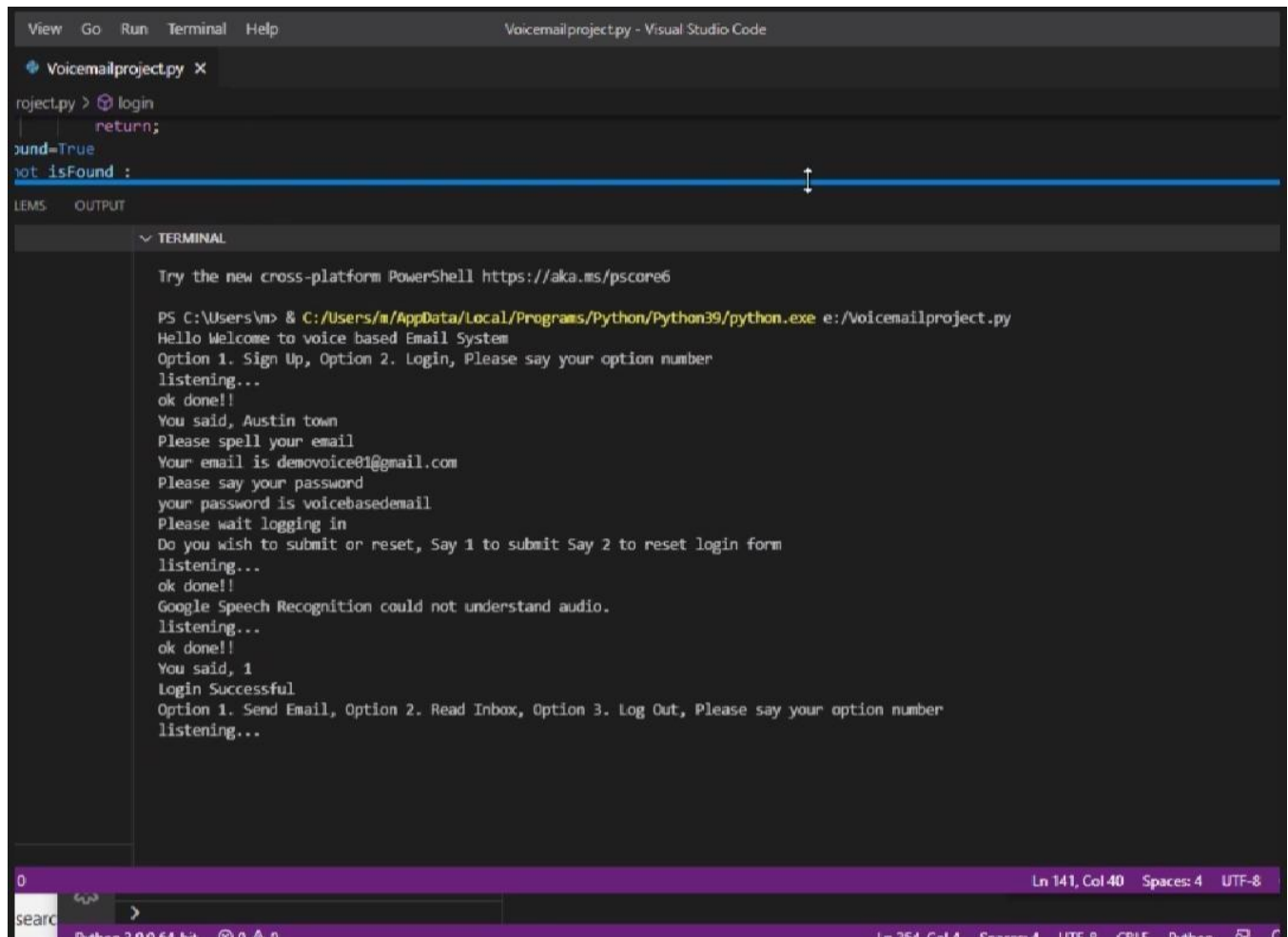
## Login:

Wrong login details:



```
Voicemailproject.py - Visual Studio Code
TERMINAL PROBLEMS OUTPUT
DEBUG CONSOLE
ok done!!
You said, Tu
Please spell your email
listening...
ok done!!
You said, IMO voice at the rate of gmail.com
Your email is imovoice@ofgmail.com
Please say your password
listening...
ok done!!
You said, demo voice
Please wait logging in
Do you wish to submit or reset, Say 1 to submit Say 2 to reset login form
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, 1
b'[AUTHENTICATIONFAILED] Invalid credentials (Failure)'
Cannot connect to gmail, Check your credentials
Option 1. Sign Up, Option 2. Login, Please say your option number
listening...
```

## Voice based email for blind



```
Voicemailproject.py X
project.py > login
return;
found=True
not_isFound :

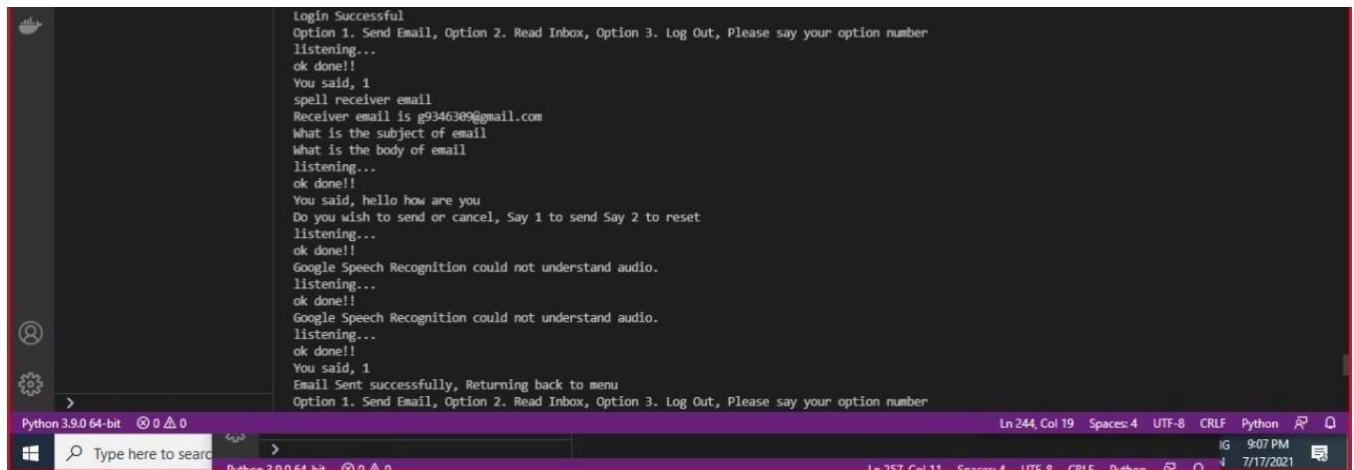
LEMS OUTPUT
~ TERMINAL
Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\va> & C:/Users/m/AppData/Local/Programs/Python/Python39/python.exe e:/Voicemailproject.py
Hello Welcome to voice based Email System
Option 1. Sign Up, Option 2. Login, Please say your option number
listening...
ok done!!
You said, Austin town
Please spell your email
Your email is demovoice01@gmail.com
Please say your password
your password is voicebasedemail
Please wait logging in
Do you wish to submit or reset, Say 1 to submit Say 2 to reset login form
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, 1
Login Successful
Option 1. Send Email, Option 2. Read Inbox, Option 3. Log Out, Please say your option number
listening...
```

Fig: login successful

## Send mail/compose mail

## Voice based email for blind



The screenshot shows a Python 3.9.0 64-bit terminal window with a dark background. The application is a voice-based email interface. The text in the terminal is as follows:

```
Login Successful
Option 1. Send Email, Option 2. Read Inbox, Option 3. Log Out, Please say your option number
listening...
ok done!!
You said, 1
spell receiver email
Receiver email is g9346309@gmail.com
What is the subject of email
What is the body of email
listening...
ok done!!
You said, hello how are you
Do you wish to send or cancel, Say 1 to send Say 2 to reset
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
Google Speech Recognition could not understand audio.
listening...
ok done!!
You said, 1
Email Sent successfully, Returning back to menu
Option 1. Send Email, Option 2. Read Inbox, Option 3. Log Out, Please say your option number
```

The terminal window has a status bar at the bottom showing "Python 3.9.0 64-bit", "Ln 244, Col 19", "Spaces: 4", "UTF-8", "CRLF", "Python", and the date "7/17/2021".

Fig: Email Send successfully

**Output of compose mail/send mail:**

(no subject)

Add label



Subject: voice based ema... 8:57 PM

to bcc: microphonebased ✓



From Subject: voice based email for blind people ·  
demovoice01@gmail.com

Bcc microphonebased@gmail.com

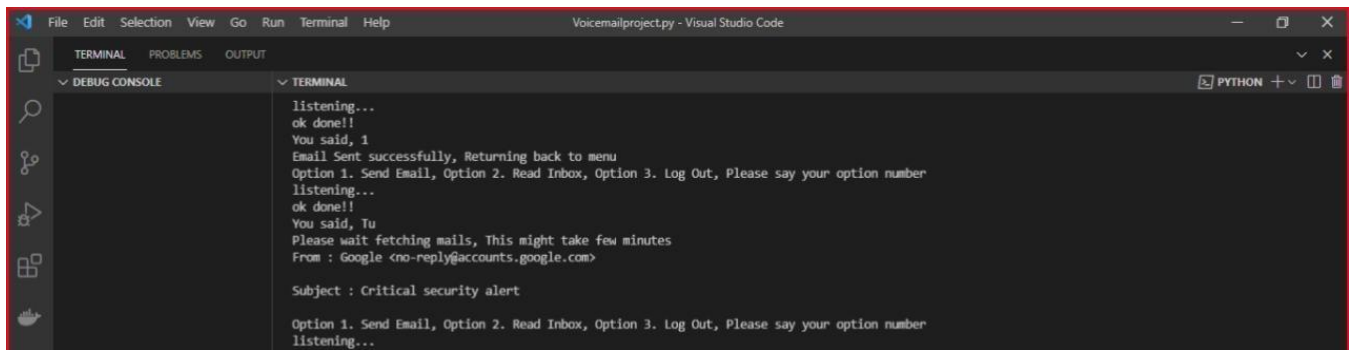
Date Jul 17, 2021, 8:57 PM

[View security details](#)

hello how are you

**Inbox:**

## Voice based email for blind



```
Voicemailproject.py - Visual Studio Code
TERMINAL PROBLEMS OUTPUT
DEBUG CONSOLE
listening...
ok done!!
You said, 1
Email Sent successfully, Returning back to menu
Option 1. Send Email, Option 2. Read Inbox, Option 3. Log Out, Please say your option number
listening...
ok done!!
You said, 2
Please wait fetching mails, This might take few minutes
From : Google <no-reply@accounts.google.com>

Subject : Critical security alert

Option 1. Send Email, Option 2. Read Inbox, Option 3. Log Out, Please say your option number
listening...
```

Fig: reads unseen mails

Output of inbox which reads unseen mails:



# Critical security alert

Inbox



Google 11:30 AM

to me ▾



## Access for less secure apps setting has been turned on



demovoice01@gmail.com

---

Access for less secure apps setting has been turned on for your Google Account [demovoice01@gmail.com](mailto:demovoice01@gmail.com). If you didn't change it, you should check what happened.

## CONCLUSION

Our application is user friendly, efficient and an economical system, which allows a visually challenged individual to interact with an Android application easily. It involves the development and implementation of a real-time email interaction system for visually impaired.

This e-mail system can be used by any user of any age group with ease of access. It has feature of speech to text as well as text to speech with speech reader which makes designed system to be handled by visually impaired person as well as blind person.

Our application can help in overcoming some of the drawbacks of the existing email systems. In this system, the use of keyboard has been eliminated completely and thus reduces the cognitive load of remembering keyboard shortcuts as well as the position of the keys on a keyboard.

The user only requires listening to the voice commands given by the system and respond accordingly in order to get the desired operations performed.

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