



BRAILLE COMMUNICATOR WITH CALLER IDENTIFICATION

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ABSTRACT

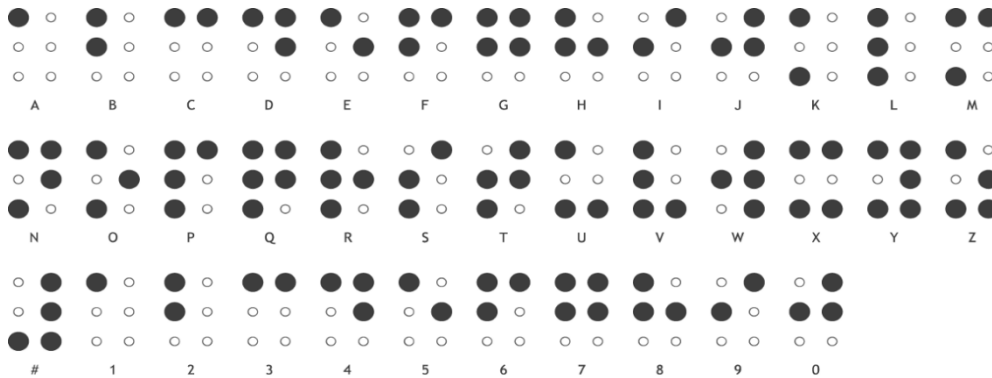
The system is specially designed for visually impaired people to link, communicate, and interact without vision. Enabling those who are blind to make use of their other senses, like sound and touch, to fulfill important tasks. Nowadays, visually impaired people have no access to advanced communication technologies. To make the blind people take advantage of the advanced telecommunication system, our approach is focused on designing a Short Messaging Service (SMS) system, that interfaces Braille keypad with the GSM (cell phone), for the blind people to communicate. For sending an SMS, Raspberry Pi is used that converts the typed letter on Braille pad to the English alphabets and then sends the text message and also converts the received message to speech. To transmit a message, the blind person takes the help of a braille computer keyboard. The message gets transmitted to the second person's cell phone. The received result is heard through a speaker. So, this is how we set up a communication device to connect visually impaired people to other people through text messages.

INTRODUCTON:

Communication is a valuable asset that almost every specie in the world is gifted with. Communication in human race comes through the use of various senses. Humans can communicate via sense of speaking, hearing and touch. But some, people are not gifted with these basic senses to communicate. As the technology has advanced, it has become fairly easy for such type of people to learn and communicate amongst themselves. As far as our project is concerned, our aim is to provide the people without sight, the opportunity to communicate via text on the go.

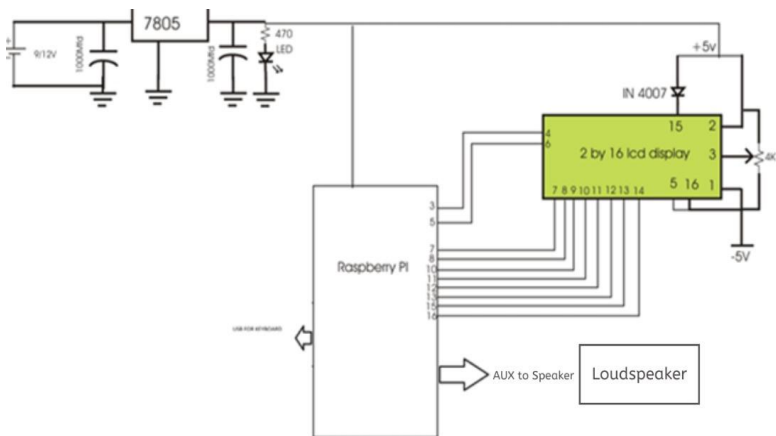
Although this problem has been solved, notably by Louis Braille - creator of the famous Braille script, this does have some limitations. It is very time consuming for a blind person to absorb all the information. Also, it is difficult for them to convey to the other person what they have to say. To make that possible, we did some research and came up with a project which will help them not just to interpret other's message but also to transmit what they themselves have to convey. They can also take help of text to speech conversion technology available on almost every smartphone these days. But there's one disadvantage, this technology isn't efficient enough for blind people to communicate. Most of the smartphones are expensive and not every feature is accessible by a blind person

That is why, we are working on this project of ours, the Braille Communicator, to make the process of communication amongst blind people easy, portable and more efficient. The Braille Communicator converts the text into speech for a blind person to listen the message and also send a reply to the other person. This device is developed in such a way that it serves as an interface between a blind person and a smartphone.



Braille representation of alphabets and number

Circuit Diagram



COMPONENTS

1. Raspberry Pi
2. Braille Keyboard
3. LCD module
4. Loudspeaker
5. 9/12V Power supply
6. 7805 Voltage Regulator IC
7. 1N 4007 Diode
8. Variable resistor(10k ohm)
9. Notification LED
10. AUX Cable

RASPBERRY PI

RASPBERRY PI is a development board in PI series. It can be considered as a single board computer that works on LINUX operating system. The board not only has tons of features it also has terrific processing speed making it suitable for advanced applications. PI board is specifically designed for hobbyist and engineers who are interested in LINUX systems and IOT (Internet of Things).



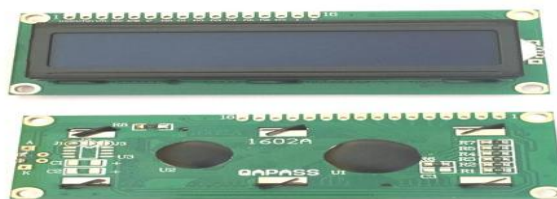
Braille Keyboard

This 104-key keyboard is equipped with clear braille labels that allow the original key legends to show through enabling both blind and sighted users access to the keyboard. This keyboard is ready to plug into a computer, and can be used to convert an existing computer for use by individuals who are blind or have low vision.



LCD Module

LCD modules are very commonly used in most embedded projects, the reason being its cheap price, availability and programmer friendly. Most of us would have come across these displays in our day to day life, either at PCO's or calculators



Loudspeaker

A loudspeaker is an electroacoustic transducer; a device which converts an electrical audio signal into a corresponding sound.



WORKING AND OPERATIONS

In Braille Communicator, text to speech conversion and sending & receiving of a text message is done by using a Raspberry PI. All programming is done in python language, which is a very easy and basic language used in Raspberry PI. It is used in many IOT devices and in Raspberry Devices for simplicity & flexibility.

For sending and receiving a message through raspberry pi, we used an API system for a virtual number. Virtual number will allow us to send and receive telecom service without a requirement of phone number registration by a local telecom operator. It can connect to all other PSTN & VoIP numbers.

For the text to Speech conversion, there are many ways but the easiest way is to use a library called pyttsx3 in python. It contains audio files database or voice recordings. Python coding provides one more logic called frequency matching. In this method the frequencies should be written on the basis of repetition of alphabets for each word and then as per the coding logic all the words having matched frequencies should be called and corresponding audio for that word should be played.

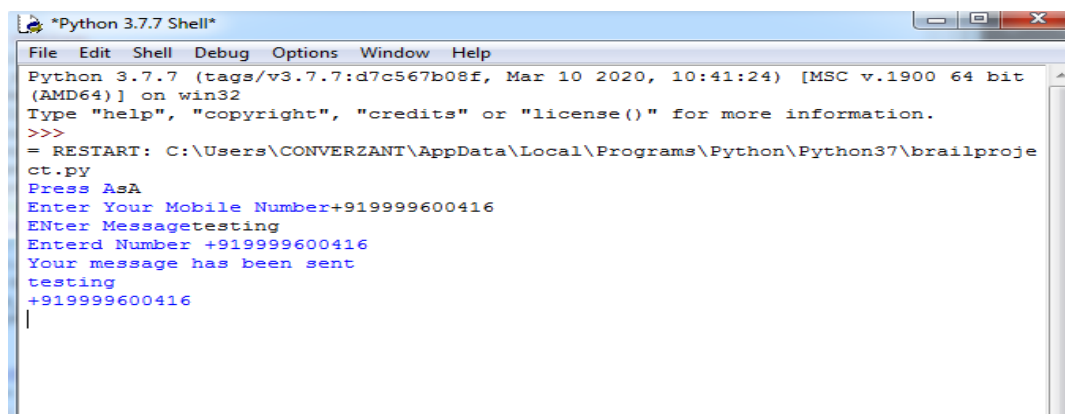
Working:-

First we need to take our server online through the command prompt using the code line “ngrok http 5000”. When the server is online we need to connect this server to API server through the API website. This will be used to send and receive the text message from the API server then to the server of device. Now we need to run our file. If a person need to send a message he can press ‘S’ key on the Braille keyboard then it will asks the person to enter the number of the receiver and then to enter the text message. After entering the number and the message he can press enter key to send the message.

For the received messages he can press ‘R’ key on the braille keyboard to read the messages. Now, this will help the visually disabled person to hear the voice from the device. At first the number of the sender is spoken which act will as a caller identification function and then the text message is speak out.

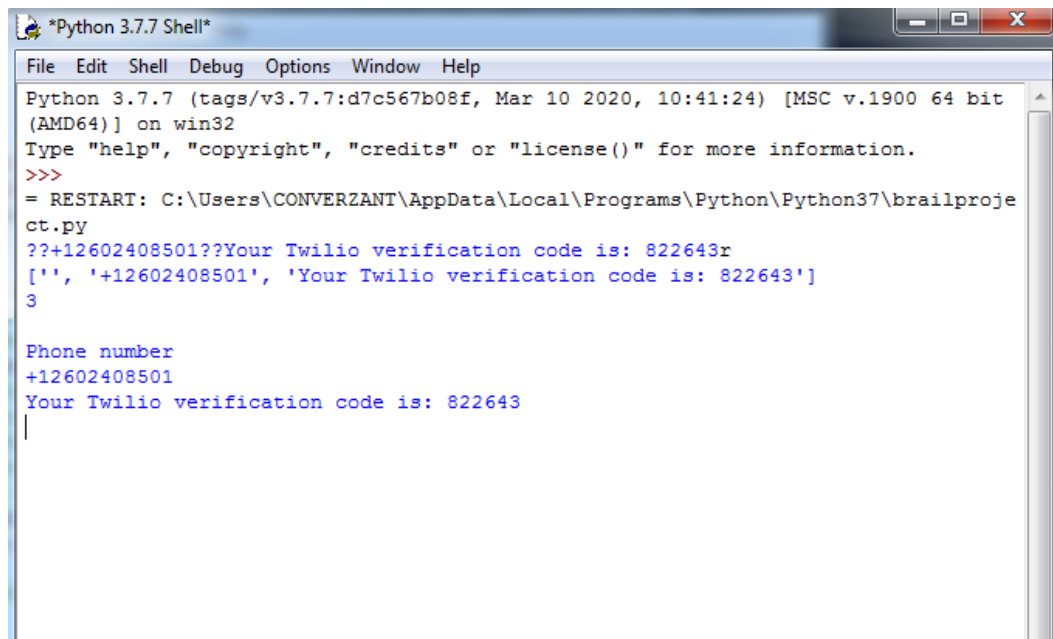
RESULT

1. Sending the text message:-



```
*Python 3.7.7 Shell*
File Edit Shell Debug Options Window Help
Python 3.7.7 (tags/v3.7.7:d7c567b08f, Mar 10 2020, 10:41:24) [MSC v.1900 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\CONVERZANT\AppData\Local\Programs\Python\Python37\brailproje
ct.py
Press AsA
Enter Your Mobile Number+919999600416
ENter Messagetesting
Enterd Number +919999600416
Your message has been sent
testing
+919999600416
|
```

2. Receiving the message:-



```

Python 3.7.7 Shell
File Edit Shell Debug Options Window Help
Python 3.7.7 (tags/v3.7.7:d7c567b08f, Mar 10 2020, 10:41:24) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\CONVERZANT\AppData\Local\Programs\Python\Python37\brailproject.py
??+12602408501??Your Twilio verification code is: 822643r
['', '+12602408501', 'Your Twilio verification code is: 822643']
3

Phone number
+12602408501
Your Twilio verification code is: 822643
|

```

CONCLUSION

The ultimate aim of this Braille communicator is to help the visually impaired people to communicate with other persons. A buzzer is used to notify the blind user that a text message is received and then he can press the read button to listen the text message. And also reply by typing the number and then the text message. Caller id is also present for each text message received the senders number will speak out before the message.

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