

CP320 - Exploration Project

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Benjamin Ngan 140567260 | Sirong Liu 150132360

Documentation

OverView of Telephone Keypad

A telephone keypad has 4 rows and 3 columns in which there is a button for 1,2,3,4,5,6,7,8,9,0,#,*. There is also a pin for each corresponding row and column, in which it connects to a GPIO pin on the raspberry pi.

Packages/Libraries

In our code we import the library called time. This library provides a time module that can be used to obtain the current time and CPU time when needed.

URL

Steps to understand how keypad works

<https://www.instructables.com/id/Using-a-keypad-with-Raspberry-Pi/>

A video that explains the keypad's mechanics and has a demonstration

<https://www.youtube.com/watch?v=yYnX5QodqQ4>

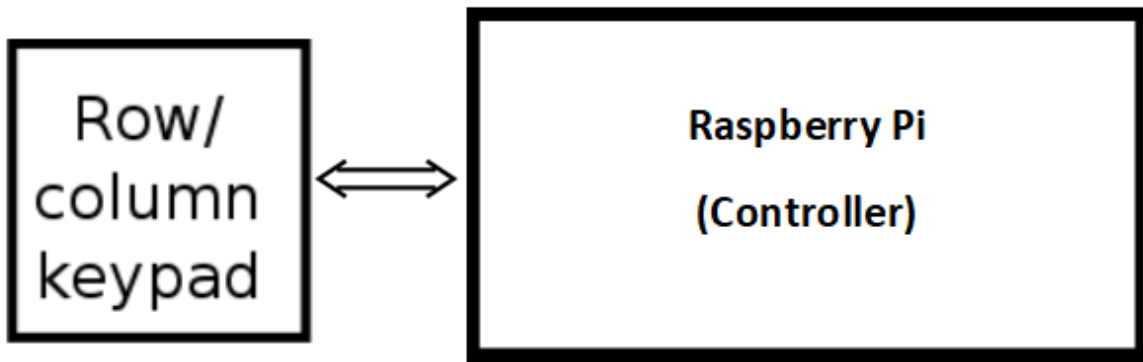
Another site that shows how the keypad works and provides code

<https://tutorials-raspberrypi.com/coniecz-raspberry-pi-kecpad-code-lock/>

Challenges and Issues

There were a few challenges and issues that appeared when using the telephone keypad. The first challenge was learning how the keypad actually worked. Thanks to the documentation on CP320 site and online sites, we were able to find out how the rows and columns correspond to individual buttons on the keypad. An issue that also appeared was coding the software in which we had to implement what we learned earlier about how the keypad worked and our own general knowledge of raspberry pi input and outputs. Also with the help of online documentation we were able to make working code.

Block Diagram



Code for Software

```
import time
import RPi.GPIO as GPIO

GPIO.setmode(GPIO.BCM)
ROW=[5,6,13,19]
COL=[16,20,21]
MATRIX = [[1, 2, 3],
           [4, 5, 6],
           [7, 8, 9],
           ['*', 0, '#']]
Amount_of_Rows=3
Amount_of_Columns=4
for i in range(Amount_of_Rows):
    GPIO.setup(COL[i],GPIO.OUT)
    GPIO.output(COL[i],1)
for j in range(Amount_of_Columns):
    GPIO.setup(ROW[j],GPIO.IN,pull_up_down=GPIO.PUD_UP)
try:
    while True:
        for i in range(Amount_of_Rows):
            GPIO.output(COL[i],0)
            for j in range(Amount_of_Columns):
                if GPIO.input(ROW[j])==0:
                    print MATRIX[j][i]
                    time.sleep(1)
                    while(GPIO.input(ROW[j])==0):
                        pass
            GPIO.output(COL[i],1)
except KeyboardInterrupt:
    GPIO.cleanup()
```