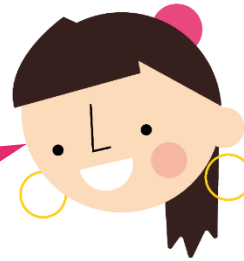


Largest Number Game

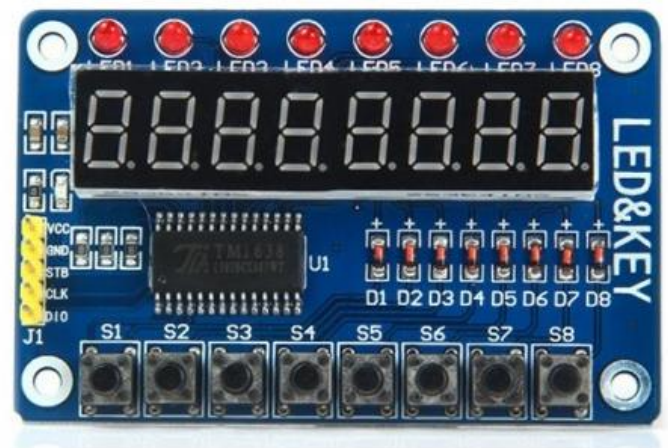


Getting started

- 1 Before turning on the Raspberry Pi wire up the board using the details below.

LED&KEY	Raspberry Pi
VCC	3.3V (Pin 1)
GND	GND (Pin 6)
STB	GPIO 22 (Pin15)
CLK	GPIO 21 (Pin 40)
DIO	GPIO 17 (Pin11)

- 2 Time to connect the power to boot up the Raspberry Pi.



3.3V	1	2	5V		
2 SDA1	3	4	5V		
3 SCL1	5	6	GND		
4 GCLK	7	8	14 TXD0		
GND	9	10	15 RXD0		
	17	11	12 18		
	27	13	14 GND		
	22	15	16 23		
3.3V	17	18	24		
10 MOSI	19	20	GND		
9 MISO	21	22	25		
11 SCLK	23	24	8 CE0_N		
GND	25	26	7 CE1_N		
ID_SD	27	28	ID_SC		
	5	29	30 GND		
	6	31	32 12		
	13	33	34 GND		
	19	35	36 16		
	26	37	38 20		
GND	25	40	21		

Find the largest number

- 1 Let's start coding:

This time we're going to create a game. The program will display 8 digits on the display and you have to press the button below the largest one. By default the game is to find 5 digits.

- 2 Run Python 3 and open a new file [File]-[New]. Save the file and call it `highestnumber.py`

You could use any name but it makes it easier for the workshop if everyone is the same

Enter the code below.

```
#!/usr/bin/env python3
# The goal of the game is to press the button related to the largest
number in the display

# TM1638 playground

# Import all the needed libraries
import TM1638 #board
import time # sleep
import random # create random number
import math # power

# These are the pins the display is connected to.
DIO = 17
CLK = 21
STB = 22

# This sets the number of puzzles to solve
gamelength=5

# Initialize the board
display = TM1638.TM1638(DIO, CLK, STB)
display.enable(1)

# Display how many to find
display.set_text("find "+str(gamelength))
time.sleep(3)

# Get the starting time
starttime = time.time()

# Main loop for the length of the game
for x in range(gamelength):

# Get something setup for the start
...largest = 0
...number=list("00000000")
...biggest=random.randint(6,7)

# Pick 8 random numbers on the display
...for x in range(8):
.....digit = random.randint(0, biggest)
.....number[x] = str(digit)

# If the number is a largest number then record the location so it can be
changed later
```

```

.....if digit > largest:
.....largest = digit

# Add 1 to largest to make it the largest number (but only one bigger
than the others
....largest+=1
....largest=str(largest)

# Pick a random number to change
....location = random.randint(0,7)

# Replace the existing number at location with the new largest number
....number[location] = largest

# Convert the list to a string using the join command
....number="".join(number)
....print(number)

# Display the 8 digits on the 7 segment
....display.set_text(number)

# Check if the correct key is pressed....

....result = pow(2,(location))
....correctkey = False
....keys = display.get_buttons()
....while correctkey==False:
.....keys = display.get_buttons()
.....if result==keys:
.....correctkey = True
.....print("keys: "+str(keys))
.....print("result: "+str(result))

# Get the total time
totaltime=time.time()-starttime

# By converting to an integer after multiplying by 100
# And then dividing by 100 it rounds to 2 decimal places.
timing = "t "+str(int(totaltime*100)/100)

# Print the score
print(timing)
display.set_text(timing)

```

Run your program and find the largest digit each time.

After the game is finished the time take will be displayed on the 7 segment display.

A few notes

The `display.get_buttons()` returns a binary number for all the 8 buttons

From left to right they are 1, 2, 4, 8, 16, 32, 64, 128

These are the decimal values for binary numbers.

Also, if you have learned about powers then these are all 2 to the power of 0,1,2,3,4,5,6,7

As in 2 to the power of 0 is 1

Or 2 to the power of 7 is 128

We know the location of our biggest digit (as we set it) so we know the result we want

Challenge

What do you have to do to make the game 10 digits long.