

ECE 476/676 - Homework #12

WiFi - Due Monday, December 8th

Roulette!

Write a Python program to play a simplified game of Roulette on your Pico board from your cell phone with a WiFi interface

- On reset, you start with \$100 in your bank account.
- Your bank value is displayed on
 - The LCD display and
 - Your cell phone via a WiFi web page
- You can then place bets on numbers 1..8 using
 - the keyboard or
 - your cell phone with a WiFi web page
- Once bets are placed a random number in the range of 50..80 is generated
 - The marble moves one position every 100ms
 - Where it stops is the winning number (position mod 8)
- Bets that win increase your bank balance by 8x that amount
- Bets that lose decrease your bank balance by that amount
- The game then repeats

Grading

- (10pt) Display your bank balance on the LCD display
- (10pt) Display your bank balance on the WiFi web page
- (10pt) Display the numbers and amount bet on each number on the LCD display
- (10pt) Accept bets from your cell phone via a WiFi web page
 - Use the keyboard if you can't get WiFi to work (no points for this)
- (10pt) Can spin the wheel from your cell phone via a WiFi connection
 - Use a button if you can't get WiFi to work (no points for this)
- (10pt) Display the changing numbers on the LCD display as the marble goes around the roulette wheel
- (10pt) Bank balance decreases on all losing bets
- (10pt) Bank balance increases 8x for all winning bets
- (10pt) Game then restarts (can play over and over)
- (10pt) Demonstrate your Roulette wheel

Solution: html page

A fairly simple web page that lets you input two numbers as well as display your winnings is below

```
<!DOCTYPE html>
<html>

<body>

<h1>Roulette Game</h1>

<p>Bank Balance = aaaaaa </p>
<p>Winning Number = bbbbbb </p>
<p>You Bet on ccccc </p>
<p>dddddd </p>

<form action="/action_page.php">
  <label for="fname">Bet Amount: </label>
  <input type="text" id="N0" name="N0"><br><br>
  <label for="lname">Numbers: </label>
  <input type="text" id="N1" name="N1"><br><br>
  <input type="submit" value="Submit">
</form>

<p>Enter a number than press Submit.</p>

</body>
</html>
```

This results in the following web page

192.168.4.1/action_page.php?N0=12&N1=14

Not secure 192.168.4.1/action_page.php?N0=12&N1=14

BISON ACADEMY Campus Connection FatCow - FileManager Pico NDSU

Roulette Game

Bank Balance = 96

Winning Number = 3

You Bet on 7

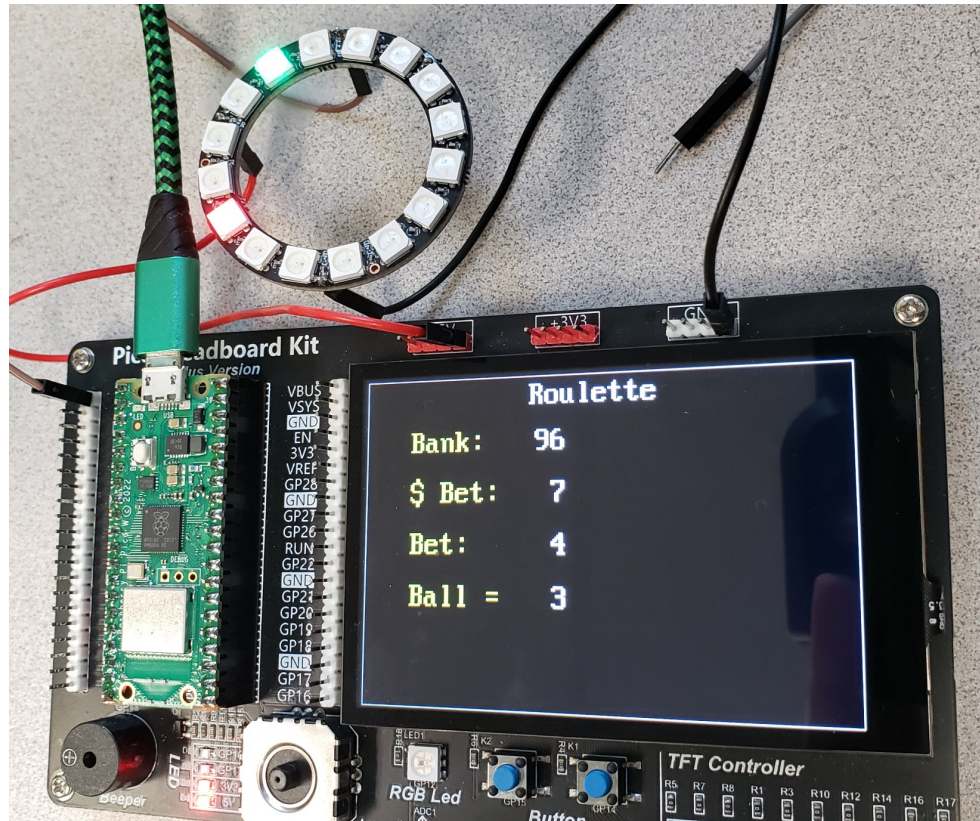
You Lose

Bet Amount:

Numbers:

Enter a number than press Submit.

Resulting Display



Test Results

Start with \$100

Bet \$7 on #4

- Winning Number #3
- Bank down to \$93
- Shows on LCD display
- Shows on web page

Bet \$12 on #6

- Winning number: #12
- Band down to \$81
- Shows on LCD display
- Shows on web page

Python Code

Web Page routine

```
def web_page(IP_Addr, x0, x1, x2, x3):
    f = open("Roulette.html", "rt")
    x = f.readlines()
    y = x[0]
    for i in range(0, len(x)):
        y = y + x[i]
    y = y.replace('\r\n', ' ')
    y = y.replace('aaaaa', str(x0))
    y = y.replace('bbbbb', str(x1))
    y = y.replace('ccccc', str(x2))
    y = y.replace('dddd', str(x3))
    return(y)
```

Initialize the AP network

```
ssid = 'Pico-Network'
password = 'PASSWORD'

ap = network.WLAN(network.AP_IF)
ap.config(essid=ssid, password=password)
ap.active(True)

while ap.active() == False:
    pass
print('AP Mode Is Active, You can Now Connect')
IP_Addr = ap.ifconfig()[0]
print('IP Address To Connect to:: ', IP_Addr)

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)
s.bind(('', 80))
s.listen(5)
```

Main Loop

```
while(1):
    conn, addr = s.accept()
    print('conn = ', conn)
    print('addr = ', addr)
    print('Got a connection from %s' % str(addr))
    request = conn.recv(1024)

    request = request.decode('utf-8')

    if(request.find('favicon') > 0):
        n = request.find('php?')+4
        request = request[n:]
        n = request.find('\r\n')
        request = request[0:n]
        msg = request.split('&')
        try:
            print('ping received')
            Bet = int(msg[0][3:])
            Number = int(msg[1][3:])
            if(Bet > 0):
                flag = 1
        except:
            print('invalid message')

    if(flag==1):
        flag = 0
        Bank -= Bet
        LCD.Number2(Bank, 3, 0, 150, 50, White, Black)
        LCD.Number2(Bet, 3, 0, 150, 100, White, Black)
        LCD.Number2(Number, 3, 0, 150, 150, White, Black)
        LCD.Number2(N0, 3, 0, 150, 200, White, Black)

        X[3*Number+1] = 50

        N = randint(48, 64)
        for i in range(0, N):
            X[N0*3] = 0
            N0 = (N0 + 1) % 16
            X[N0*3] = 50
            bitstream(np, 0, timing, X)
            LCD.Number2(N0, 3, 0, 150, 200, Yellow, Black)
            Beep()
            sleep_ms(20 + int(1000/(N-i)))
        if(N0 == Number):
            Bank += 16*Bet
            print('You Won')
            msg = 'You Win'
        else:
            print('You Lose')
            msg = 'You Lose'

        LCD.Number2(Bank, 3, 0, 150, 50, White, Black)
        LCD.Number2(Number, 3, 0, 150, 100, White, Black)
        LCD.Number2(Bet, 3, 0, 150, 150, White, Black)
        LCD.Number2(N0, 3, 0, 150, 200, White, Black)
        X[3*Number+1] = 0

    response = web_page(IP_Addr, Bank, N0, Number, msg)
    conn.send(response)
    conn.close()
    print('Connection Closed')
```