

Assignment 2

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1. Create a Counter using one 7-Segment Display, which counts from 0 to 9

<https://www.tinkercad.com/things/dndZWLSJcXI-cool-jarv-vihelmo/editel?sharecode=8NaW90SxK2saJwnufUkRSfFROAb7t3fD4dfWPDlwP1U>

2. Create a Counter which counts from 0-999 and resets when a button is pressed. Use 7-Segment Display with CD4511 Decoder IC.

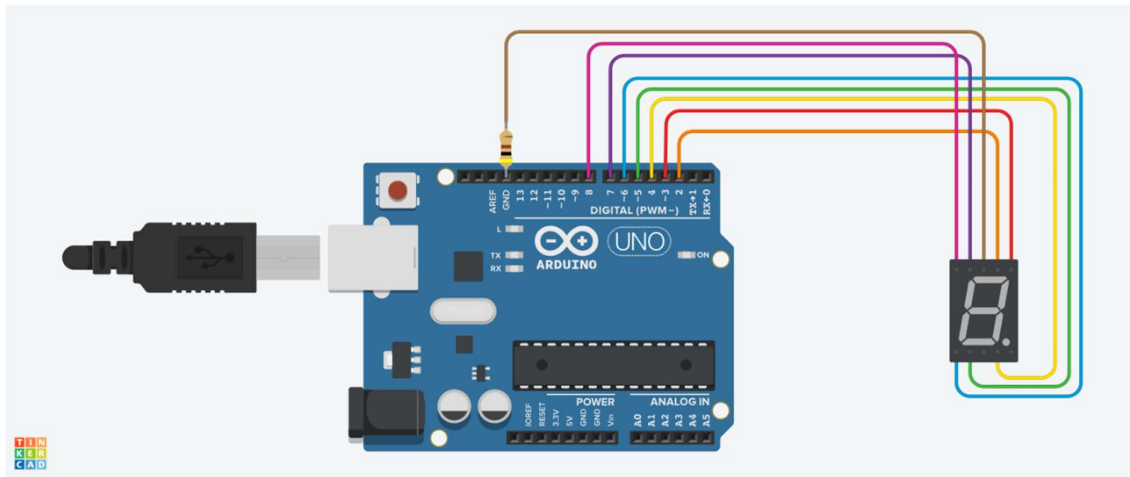
<https://www.tinkercad.com/things/eykVfG7qpLk-spectacular-amur-densor/editel?sharecode=q9A-JJmVNwEGqhr5JyCQNdwEaeo4XjibLRRWf8AHSZo>

3. Go through the 16x2 LCD and display your name and roll number.

Note: Try using autoscroll function.

<https://www.tinkercad.com/things/0OVJXWLRRjF-super-kieran/editel?sharecode=b9Vqigx-B0eNK3DHTbZfKzGJzD8xu02P8e7aHunadyI>

Circuit Diagram:



Counts from 0 to 9

To display a counter from 0 to 9 using a 7-segment display with an Arduino, we need a common cathode 7-segment display and a few additional components. The code for same is as following:

```
#define segA 2
#define segB 3
#define segC 4
#define segD 5
#define segE 6
#define segF 7
#define segG 8
int COUNT=0;
void setup(){
    for (int i=2;i<9;i++){
        pinMode(i, OUTPUT);
    }
}

void loop(){
    switch (COUNT){
```

case 0:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, HIGH);  
digitalWrite(segF, HIGH);  
digitalWrite(segG, LOW);  
break;
```

case 1:

```
digitalWrite(segA, LOW);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, LOW);  
digitalWrite(segE, LOW);  
digitalWrite(segF, LOW);  
digitalWrite(segG, LOW);  
break;
```

case 2:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, LOW);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, HIGH);  
digitalWrite(segF, LOW);  
digitalWrite(segG, HIGH);  
break;
```

case 3:

```
digitalWrite(segA, HIGH);
```

```
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, LOW);  
digitalWrite(segF, LOW);  
digitalWrite(segG, HIGH);  
break;
```

case 4:

```
digitalWrite(segA, LOW);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, LOW);  
digitalWrite(segE, LOW);  
digitalWrite(segF, HIGH);  
digitalWrite(segG, HIGH);  
break;
```

case 5:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, LOW);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, LOW);  
digitalWrite(segF, HIGH);  
digitalWrite(segG, HIGH);  
break;
```

case 6:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, LOW);  
digitalWrite(segC, HIGH);
```

```
digitalWrite(segD, HIGH);  
digitalWrite(segE, HIGH);  
digitalWrite(segF, HIGH);  
digitalWrite(segG, HIGH);  
break;
```

case 7:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, LOW);  
digitalWrite(segE, LOW);  
digitalWrite(segF, LOW);  
digitalWrite(segG, LOW);  
break;
```

case 8:

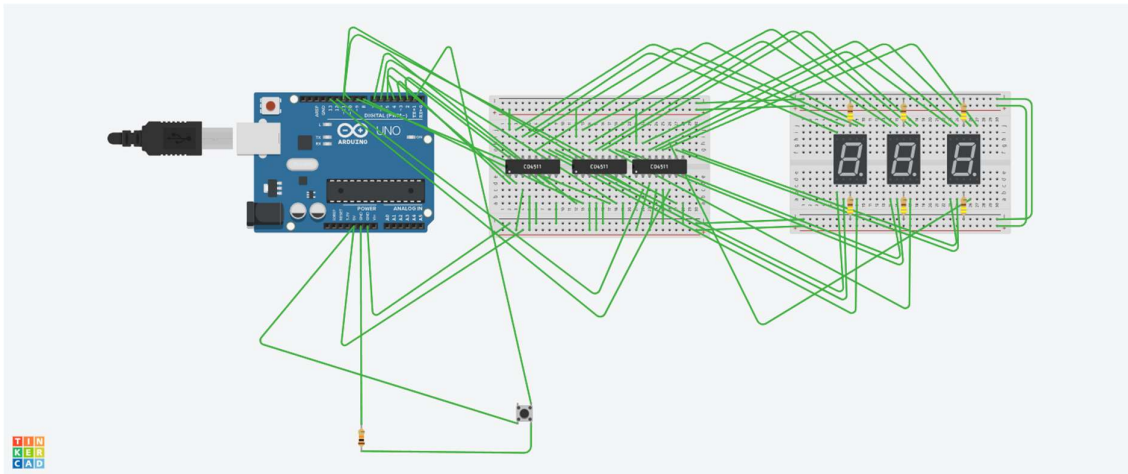
```
digitalWrite(segA, HIGH);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, HIGH);  
digitalWrite(segF, HIGH);  
digitalWrite(segG, HIGH);  
break;
```

case 9:

```
digitalWrite(segA, HIGH);  
digitalWrite(segB, HIGH);  
digitalWrite(segC, HIGH);  
digitalWrite(segD, HIGH);  
digitalWrite(segE, LOW);
```

```
        digitalWrite(segF, HIGH);  
        digitalWrite(segG, HIGH);  
        break;  
    break;  
}  
if (COUNT<10){  
    COUNT++;  
    delay(1000);  
}  
if (COUNT==10){  
    COUNT=0;  
    delay(1000);  
}  
}
```

Objective 2



Counter which counts from 0-999 and resets when a button is pressed

The CD4511 is a BCD to 7-segment decoder IC that can be used to drive a common cathode 7-segment display. It can simplify the process of interfacing a counter with a 7-segment display. However, keep in mind that the CD4511 is a BCD to 7-segment decoder, and it's designed to work with 4-bit BCD input, which limits the count range to 0-9 for each digit.

If we want to display a counter from 0 to 999 using multiple CD4511 ICs and common cathode 7-segment displays, we'll need three CD4511 ICs to control three digits.

The code for same is as following:

//Code

```
int buttonPin=1;
```

```
int a1 = 2;
```

```
int a2 = 3;
```

```
int a3 = 4;
```

```
int a4 = 5;
```

```
int a5 = 6;
```

```
int a6 = 7;
```

```
int a7 = 8;
```

```
int a8 = 9;
```

```
int a9 = 10;
```

```
int a10 =11;
```

```
int a11 = 12;
int a12 = 13;
int d1;
int d2;
int d3;

void setup()
{
  pinMode(1,INPUT);
  pinMode(2,OUTPUT);
  pinMode(3,OUTPUT);
  pinMode(4,OUTPUT);
  pinMode(5,OUTPUT);
  pinMode(6,OUTPUT);
  pinMode(7,OUTPUT);
  pinMode(8,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(10,OUTPUT);
  pinMode(11,OUTPUT);
  pinMode(12,OUTPUT);
  pinMode(13,OUTPUT);

}

void disp3(int num){
  if(num == 0)
  {
    digitalWrite(a9, LOW);
    digitalWrite(a10, LOW);
    digitalWrite(a11, LOW);
```



```
    digitalWrite(a12, LOW);  
}  
if(num == 1)  
{  
    digitalWrite(a9, HIGH);  
    digitalWrite(a10, LOW);  
    digitalWrite(a11, LOW);  
    digitalWrite(a12, LOW);  
}  
if(num == 2)  
{  
    digitalWrite(a9, LOW);  
    digitalWrite(a10, HIGH);  
    digitalWrite(a11, LOW);  
    digitalWrite(a12, LOW);  
}  
if(num == 3)  
{  
    digitalWrite(a9, HIGH);  
    digitalWrite(a10, HIGH);  
    digitalWrite(a11, LOW);  
    digitalWrite(a12, LOW);  
}  
if(num == 4)  
{  
    digitalWrite(a9, LOW);  
    digitalWrite(a10, LOW);  
    digitalWrite(a11, HIGH);  
    digitalWrite(a12, LOW);  
}
```

```
}  
  
if(num == 5)  
{  
    digitalWrite(a9, HIGH);//1  
    digitalWrite(a10, LOW);//0  
    digitalWrite(a11, HIGH);//1  
    digitalWrite(a12, LOW);//0  
}  
  
if(num == 6)//0110  
{  
    digitalWrite(a9, LOW);//0  
    digitalWrite(a10, HIGH);//1  
    digitalWrite(a11, HIGH);//1  
    digitalWrite(a12, LOW);//0  
}  
  
if(num == 7) //0111  
{  
    digitalWrite(a9, HIGH);//1  
    digitalWrite(a10, HIGH);//1  
    digitalWrite(a11, HIGH);//1  
    digitalWrite(a12, LOW);//0  
}  
  
if(num == 8) //1000  
{  
    digitalWrite(a9, LOW);//0  
    digitalWrite(a10, LOW);//0  
    digitalWrite(a11, LOW);//0  
    digitalWrite(a12, HIGH);//1  
}
```

```
if(num == 9)//1001
{
    digitalWrite(a9, HIGH);//1
    digitalWrite(a10, LOW);//0
    digitalWrite(a11, LOW);//0
    digitalWrite(a12, HIGH);//1
}
}
```

```
void disp2(int num){
    if(num == 0)
    {
        digitalWrite(a5, LOW);
        digitalWrite(a6, LOW);
        digitalWrite(a7, LOW);
        digitalWrite(a8, LOW);
    }
    if(num == 1)
    {
        digitalWrite(a5, HIGH);
        digitalWrite(a6, LOW);
        digitalWrite(a7, LOW);
        digitalWrite(a8, LOW);
    }
    if(num == 2)
    {
        digitalWrite(a5, LOW);
        digitalWrite(a6, HIGH);
        digitalWrite(a7, LOW);
    }
}
```

```
    digitalWrite(a8, LOW);
}
if(num == 3)
{
    digitalWrite(a5, HIGH);
    digitalWrite(a6, HIGH);
    digitalWrite(a7, LOW);
    digitalWrite(a8, LOW);
}
if(num == 4)
{
    digitalWrite(a5, LOW);
    digitalWrite(a6, LOW);
    digitalWrite(a7, HIGH);
    digitalWrite(a8, LOW);
}
if(num == 5)
{
    digitalWrite(a5, HIGH);//1
    digitalWrite(a6, LOW);//0
    digitalWrite(a7, HIGH);//1
    digitalWrite(a8, LOW);//0
}
if(num == 6)//0110
{
    digitalWrite(a5, LOW);//0
    digitalWrite(a6, HIGH);//1
    digitalWrite(a7, HIGH);//1
    digitalWrite(a8, LOW);//0
}
```

```

    }

    if(num == 7) //0111
    {
        digitalWrite(a5, HIGH);//1
        digitalWrite(a6, HIGH);//1
        digitalWrite(a7, HIGH);//1
        digitalWrite(a8, LOW);//0
    }

    if(num == 8) //1000
    {
        digitalWrite(a5, LOW);//0
        digitalWrite(a6, LOW);//0
        digitalWrite(a7, LOW);//0
        digitalWrite(a8, HIGH);//1
    }

    if(num == 9)//1001
    {
        digitalWrite(a5, HIGH);//1
        digitalWrite(a6, LOW);//0
        digitalWrite(a7, LOW);//0
        digitalWrite(a8, HIGH);//1
    }
}

void disp1(int num){
    if(num == 0)
    {
        digitalWrite(a1, LOW);
        digitalWrite(a2, LOW);
        digitalWrite(a3, LOW);
    }
}

```

```
    digitalWrite(a4, LOW);  
}  
if(num == 1)  
{  
    digitalWrite(a1, HIGH);  
    digitalWrite(a2, LOW);  
    digitalWrite(a3, LOW);  
    digitalWrite(a4, LOW);  
}  
if(num == 2)  
{  
    digitalWrite(a1, LOW);  
    digitalWrite(a2, HIGH);  
    digitalWrite(a3, LOW);  
    digitalWrite(a4, LOW);  
}  
if(num == 3)  
{  
    digitalWrite(a1, HIGH);  
    digitalWrite(a2, HIGH);  
    digitalWrite(a3, LOW);  
    digitalWrite(a4, LOW);  
}  
if(num == 4)  
{  
    digitalWrite(a1, LOW);  
    digitalWrite(a2, LOW);  
    digitalWrite(a3, HIGH);  
    digitalWrite(a4, LOW);  
}
```

```
}  
  
if(num == 5)  
{  
    digitalWrite(a1, HIGH);//1  
    digitalWrite(a2, LOW);//0  
    digitalWrite(a3, HIGH);//1  
    digitalWrite(a4, LOW);//0  
}  
  
if(num == 6)//0110  
{  
    digitalWrite(a1, LOW);//0  
    digitalWrite(a2, HIGH);//1  
    digitalWrite(a3, HIGH);//1  
    digitalWrite(a4, LOW);//0  
}  
  
if(num == 7) //0111  
{  
    digitalWrite(a1, HIGH);//1  
    digitalWrite(a2, HIGH);//1  
    digitalWrite(a3, HIGH);//1  
    digitalWrite(a4, LOW);//0  
}  
  
if(num == 8) //1000  
{  
    digitalWrite(a1, LOW);//0  
    digitalWrite(a2, LOW);//0  
    digitalWrite(a3, LOW);//0  
    digitalWrite(a4, HIGH);//1  
}
```

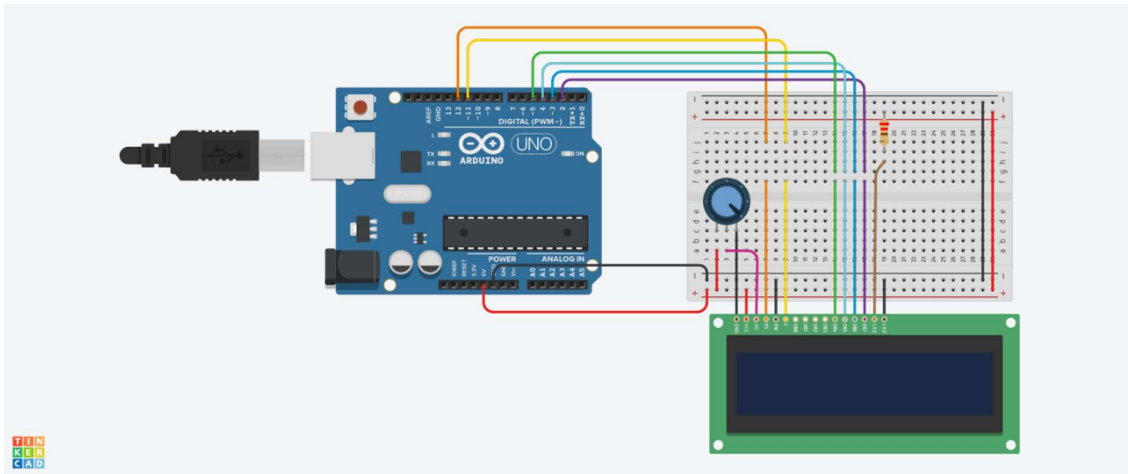
```

if(num == 9)//1001
{
    digitalWrite(a1, HIGH);//1
    digitalWrite(a2, LOW);//0
    digitalWrite(a3, LOW);//0
    digitalWrite(a4, HIGH);//1
}
}
int n=0;
int buttonState=0;
void loop(){
    buttonState = digitalRead(buttonPin);
    if (buttonState == HIGH) {
        n=0;

    } else {
        n++;
        d1=n%10;
        d2=(n/10)%10;
        d3=(n/100)%10;
        disp1(d3);
        disp2(d2);
        disp3(d1);
        delay(200);
    }
}
}

```


Objective 3



16x2 LCD which display my name and roll number

A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD display has 16 characters per row and 2 rows, making it a total of 32 characters. In this LCD each character is displayed in 5x7 pixel matrix. 16x2 LCD display with an Arduino is used to display name and roll number. The code is as follows:

```
#include <LiquidCrystal.h>

int seconds = 0;

LiquidCrystal lcd_1(12, 11, 5, 4, 3, 2);

void setup(){
  lcd_1.begin(16, 2);
}

void loop(){
  lcd_1.setCursor(0, 0);
  lcd_1.print(" 210108040 ");
  lcd_1.autoscroll();
  lcd_1.setCursor(0, 1);
  lcd_1.print(" Rinshi Kumari ");
  delay(1000);
  lcd_1.autoscroll();
}
```