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Title of Lab Assignment: Programs based on interfacing & segment as a counter with Arduino.	
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CO Mapped: CO3, CO4	PO Mapped: PO1, PO2, PO5, PO7, PSO1	Signature:

Practical No. 8

Aim: Programs based on interfacing & segment as a counter with Arduino.

Theory:

Seven-Segment Display

A seven-segment display is a form of electronic display device for displaying decimal numerals that are an alternative to the more complex dot matrix displays. Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

The 7-segment display, also written as "seven segment display", consists of seven LEDs (hence its name) arranged in a rectangular fashion. Each of the seven LEDs is called a segment because when illuminated the segment forms part of a numerical digit (both Decimal and Hex) to be displayed. An additional 8th LED is sometimes used within the same package thus allowing the indication of a decimal point, (DP) when two or more 7-segment displays are connected together to display numbers greater than ten.

LED based 7-segment displays are very popular amongst Electronics hobbyists as They are easy to use and easy to understand. In most practical applications, 7- segment displays are driven by a suitable decoder/driver IC such as the CMOS 4511 or TTL 7447 from a 4-bit BCD input. Today, LED based 7-segment displays have been largely replaced by liquid crystal displays (LCDs) which consume less current.

Seven-segment LED circuit configuration

LED display devices have two kinds of circuit: common anode and common cathode.

- Common anode: when the common pin is positive.
- Common cathode: when the common pin is negative.

Segment displays are available in various colors (Red, Blue, and Green) and sizes (0.56 to 6.5 inches). Sometimes two to four 7-segment displays are packed together to form a big display. Few of the 7-segment displays have 8 LEDs. It is in the form of an additional circular LED on board.The circular LED indicates decimal point in numeral.

Applications of Seven Segment Displays:

Common applications of seven segment displays are in:

- Digital clocks
- Clock radios
- Radio frequency indicators
- Wrist Watches
- Speedometers
- Motor-vehicle odometers
- Calculators

Code:

```cpp
// C++ code
//
const int A= 13;
const int B = 12;
const int C = 11;
const int D = 10;
const int E = 9;
const int F = 8;
const int G = 7;
void setup() {
  pinMode(A, OUTPUT);
  pinMode(B, OUTPUT);
  pinMode(C, OUTPUT);
  pinMode(D, OUTPUT);
  pinMode(E, OUTPUT);
  pinMode(F, OUTPUT);
  pinMode(G, OUTPUT);
}

void zero (void){
  digitalWrite(A,HIGH);
  digitalWrite(B,HIGH);
```

```
   digitalWrite(C,HIGH);
   digitalWrite(D,HIGH);
   digitalWrite(E,HIGH);
   digitalWrite(F,HIGH);
   digitalWrite(G,LOW);
}

voidone (void){
   digitalWrite(A,LOW);
   digitalWrite(B,HIGH);
   digitalWrite(C,HIGH);
   digitalWrite(D,LOW);
   digitalWrite(E,LOW);
   digitalWrite(F,LOW);
   digitalWrite(G,LOW);
}

voidtwo (void){
   digitalWrite(A,HIGH);
   digitalWrite(B,HIGH);
   digitalWrite(C,LOW);
   digitalWrite(D,HIGH);
   digitalWrite(E,HIGH);
   digitalWrite(F,LOW);
   digitalWrite(G,HIGH);
}

voidthree (void){
   digitalWrite(A,HIGH);
   digitalWrite(B,HIGH);
   digitalWrite(C,HIGH);
   digitalWrite(D,HIGH);
   digitalWrite(E,LOW);
```

```
      digitalWrite(F,LOW);
      digitalWrite(G,HIGH);
}

voidFour (void){
      digitalWrite(A,LOW);
      digitalWrite(B,HIGH);
      digitalWrite(C,HIGH);
      digitalWrite(D,LOW);
      digitalWrite(E,LOW);
      digitalWrite(F,HIGH);
      digitalWrite(G,HIGH);
}

voidnine (void){
      digitalWrite(A,HIGH);
      digitalWrite(B,HIGH);
      digitalWrite(C,HIGH);
      digitalWrite(D,HIGH);
      digitalWrite(E,LOW);
      digitalWrite(F,HIGH);
      digitalWrite(G,HIGH);
}

voidloop() {
      zero();
      delay(500);
      one();
      delay(500);
      two();
      delay(500);
      three();
      delay(500);
```
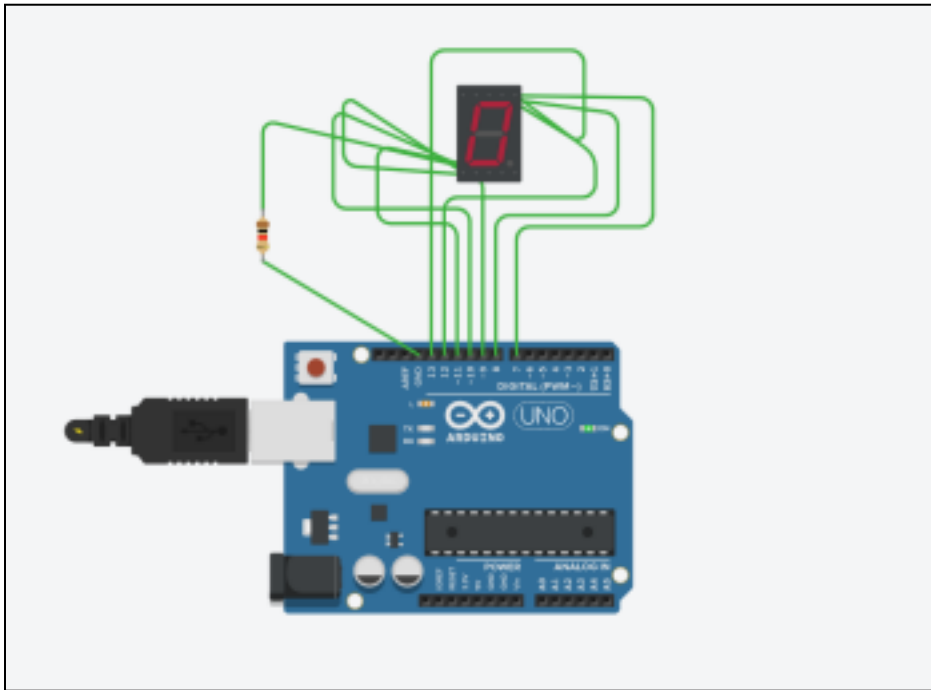
Four();

delay(500);

nine();

delay(500);//Waitfor1000millisecond(s)

}

Circuit Diagram:
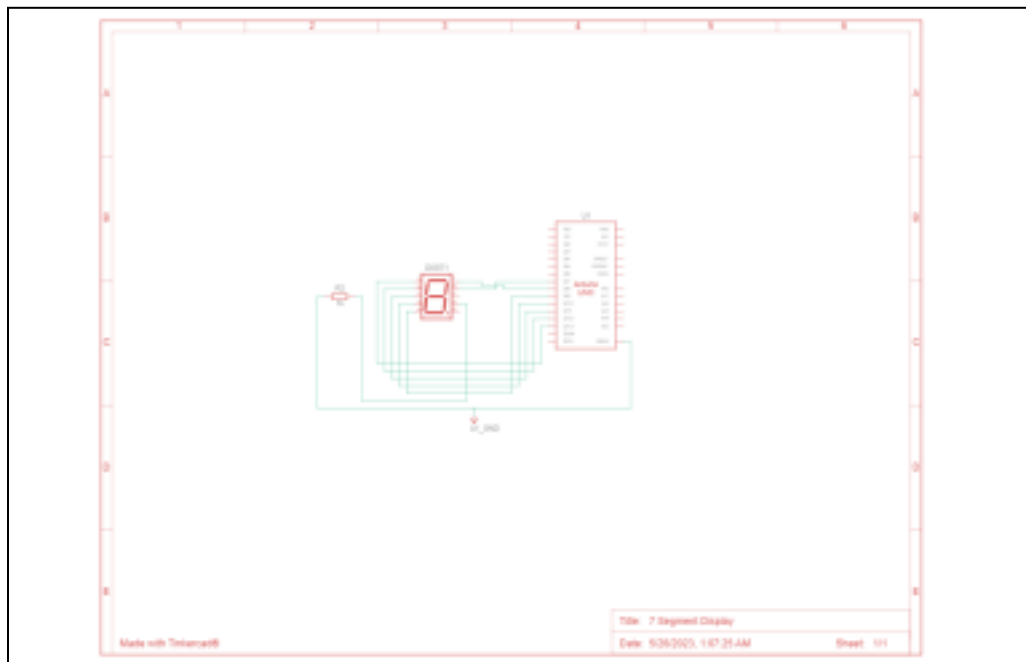
Output:

Conclusion: Hence, we have successfully implemented programs based on interfacing & segment as a counter with Arduino.