Benzon Carlitos Salazar
CS412 Week 10 Assignment

FND Display

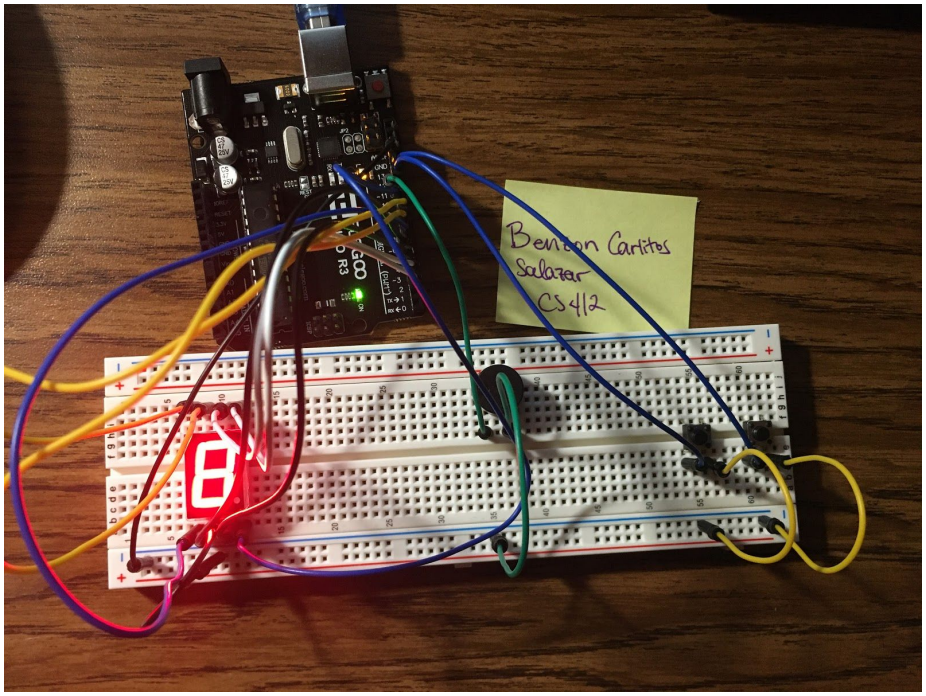
Summary:

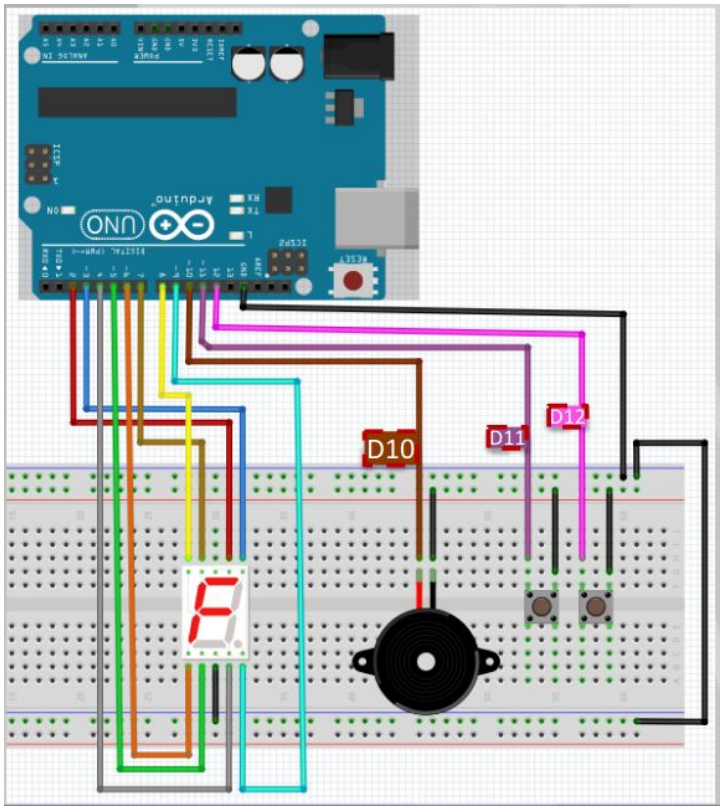
The scenario is a timer bomb. The timer bomb will give you a countdown from 9 to 0, when the timer hits 0, you are to press one of the buttons, one button will cause the buzzer to go off, **indicating the bomb has exploded,** while the other is to stop the countdown. Your job is to press the correct button, but of course this will be impossible since the option whether or not one of the buttons is the correct one or not will be random, thanks to the `random()` function. Pressing both buttons will cause the whole thing to restart.

Hardware Requirements:

- 1 x Arduino UNO Controller Board
- 16 x Breadboard Jumper Wire
- 1 x Tie-points breadboard
- 1 x Digit 7-Segment FND
- 1 x Passive Buzzer
- 2 x Buttons

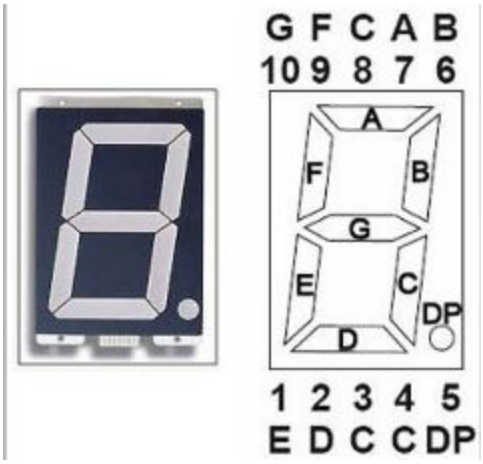
The Circuit:





Circuit Explanation:

For a clearer understanding of the circuit, please refer to the bottom picture showing a cleaner look at what the circuit wiring should look like. Basically, the FND is a form of electronic display device that displays decimals numerals. Each of the 7 segment display consists of seven LEDs arranged in a rectangular fashion shown in the bottom image. Each one of those segments is given a positional segment with one of its connection pins being brought straight out. These LED pins are labelled ‘A’ through ‘G’, as shown here:



Each LED has two connecting pins, the anode and the cathode, and for this assignment, we are using a common cathode 7 segment display.

Code:

```
#define FND_A 2
#define FND_DP 9
int beepPin = 10;
int btn1 = 11;
int btn2 = 12;
long randNumber;

void setup() {
  for(int i = FND_A; i <= 10; i++) {
     pinMode(i, OUTPUT);
  }
  pinMode(btn1, INPUT_PULLUP);
  pinMode(btn2, INPUT_PULLUP);
  Serial.begin(9600);
  randomSeed(analogRead(0));
  randNumber = random(11, 13);
}

boolean digit[10][8] = {
  {1, 1, 1, 1, 1, 1, 0, 0}, // 0
  {0, 1, 1, 0, 0, 0, 0, 0}, // 1
  {1, 1, 0, 1, 1, 0, 1, 0}, // 2
  {1, 1, 1, 1, 0, 0, 1, 0}, // 3
  {0, 1, 1, 0, 0, 1, 1, 0}, // 4
  {1, 0, 1, 1, 0, 1, 1, 0}, // 5
  {1, 0, 1, 1, 1, 1, 1, 0}, // 6
  {1, 1, 1, 0, 0, 0, 0, 0}, // 7
  {1, 1, 1, 1, 1, 1, 1, 0}, // 8
  {1, 1, 1, 0, 0, 1, 1, 0}, // 9
};

int j = 9;

void loop() {
  for(j = 9; j >= 0; j--){
     for(int i = FND_A; i <= FND_DP; i++){
          digitalWrite(i, digit[j][i - 2]);
          chk_btn();
     }
     if(j == 0) analogWrite(beepPin, 5);
```

```
      else analogWrite(beepPin, 0);
      delay(1000);
  }
}

void chk_btn() {
  while(true) {
      if(digitalRead(btn1) == LOW && digitalRead(btn2) == LOW) {
            j = 9;
            randNumber = random(11, 13);
            Serial.println(randNumber);
      }else if(digitalRead(btn1) == LOW) {
            if(randNumber == btn1) {
                  analogWrite(beepPin, 20);
                  delay(100);
            }else {
                  delay(100);
            }
      }else if(digitalRead(btn2) == LOW) {
            if(randNumber == btn2) {
                  analogWrite(beepPin, 20);
                  delay(100);
            }else {
                  delay(100);
            }
      }else {
            break;
      }
  }
}
```