BUZZ WIRE GAME

DIY PROJECT

IITKGP

BUZZ WIRE GAME

By ---

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ABOUT THE PROJECT

Project Name : Buzz Wire Game

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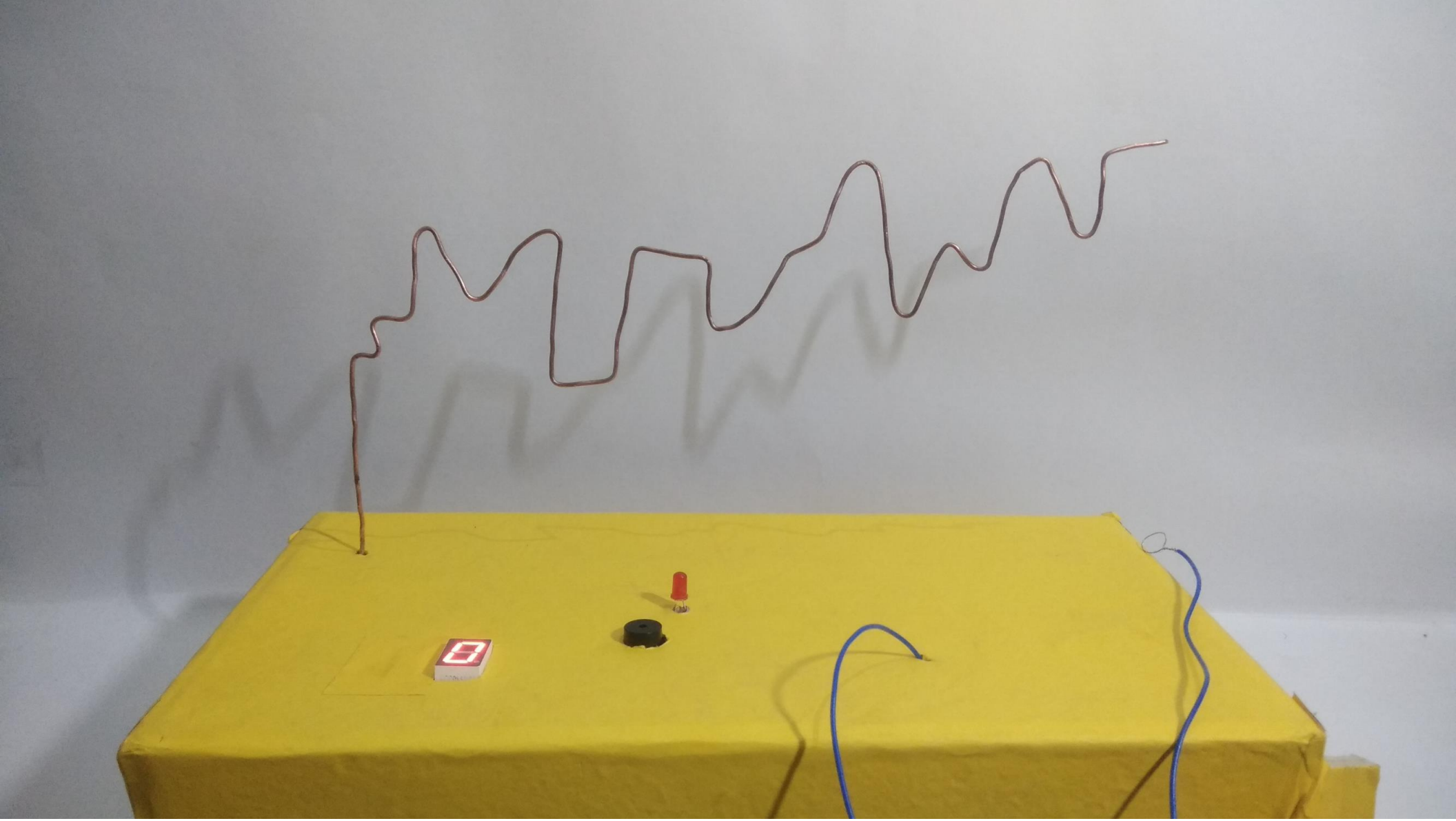
Guidance : Mr. Bharat Naik
Prof. Arkopal Goswami
Prof. Gouri Gargate
Prof. Mamoni Banerjee



Buzz wire is a steady hand game made from the background of coding and Arduino hardware. It has a wire that is bent into a curvilinear path to make the game challenging and competitive. The player's main objective is to bring the metal hoop from one to the other end without touching the wire. Whenever the player touches the wire, the LED will glow, and the buzzer will buzz. There is a limit set for the number of fails, and if the player crosses the threshold, the game ends. Further thing, here, is an LED counter which displays the number of fails.

PROJECT AGENDA

Week 1

- Project selection
- Understanding and studying about the project
- Working on required components

Week 2

- Project agenda determination
- Task distribution

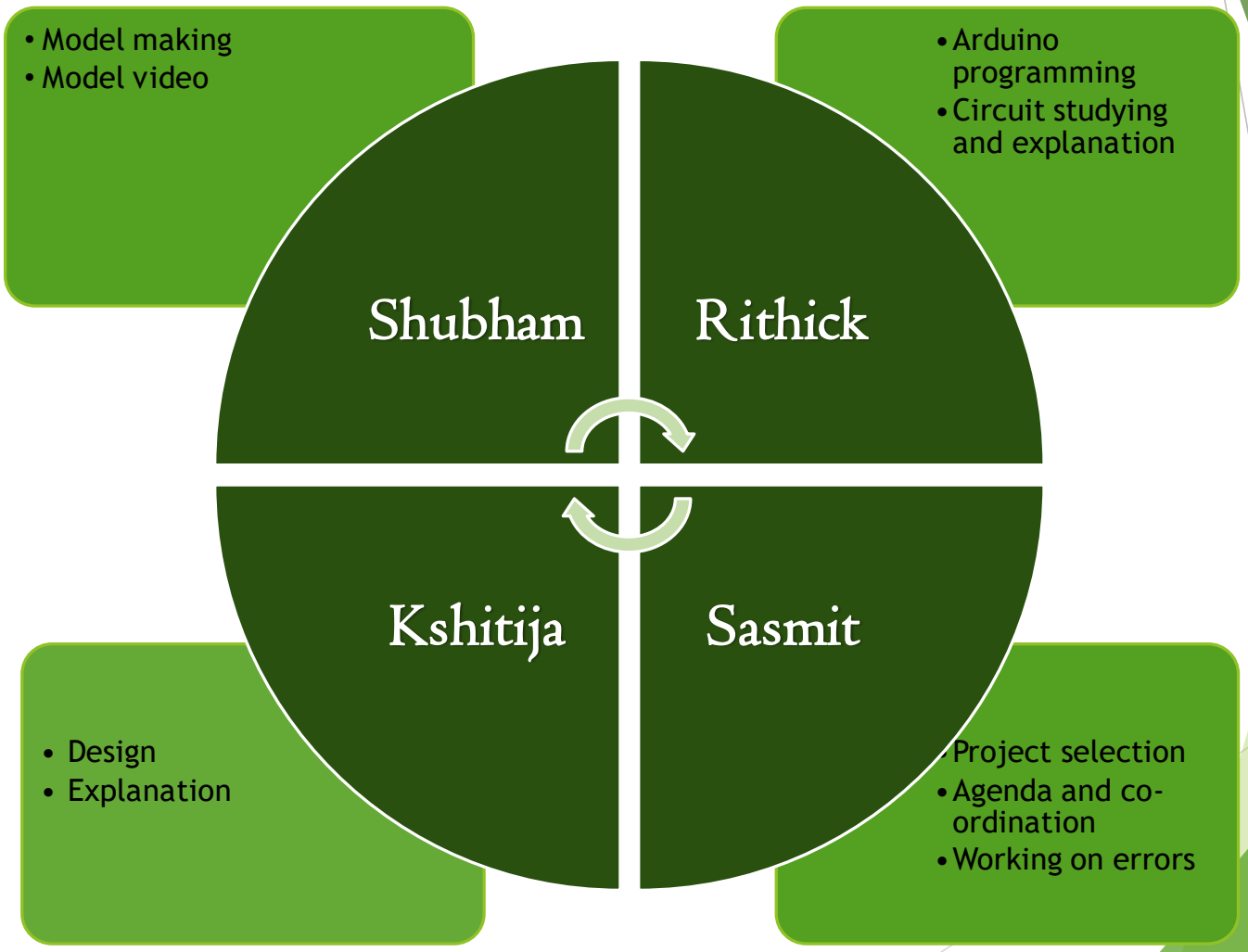
Week 3

- Model Making
- Coding
- Circuit generation

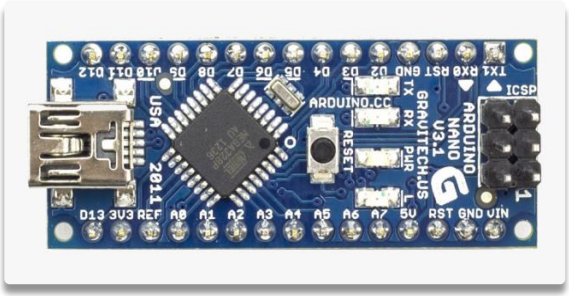
Week 4

- Execution
- Working on errors and their removal
- Design

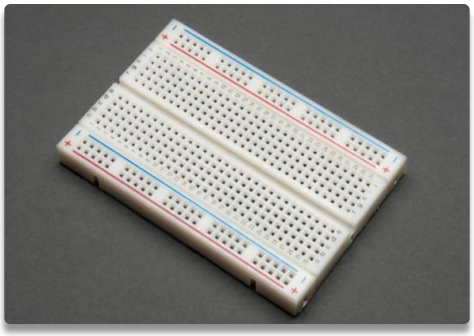
TASK DISTRIBUTION



REQUIRED COMPONENTS



Arduino Nano



Breadboard

Buzzer

REQUIRED COMPONENTS

7 Segment LED

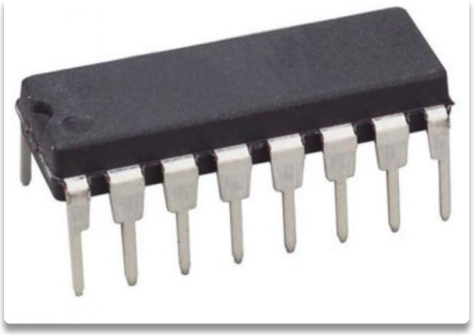
Resistors

Steel Wire

REQUIRED COMPONENTS

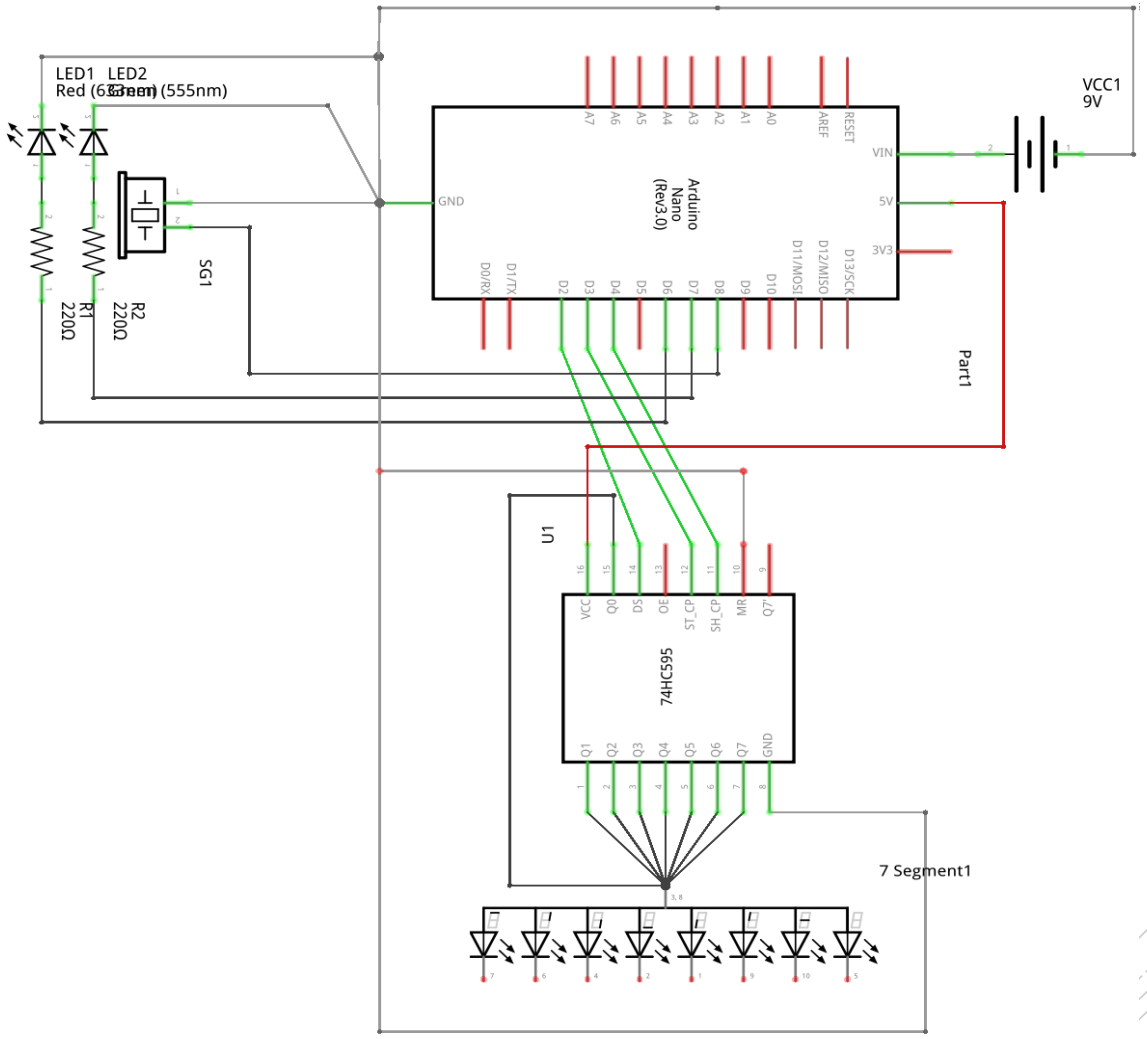
Jumper Wire

9V Battery



74HC595

Circuit Diagram



Circuit Explanation

Arduino Nano, 7 segment LED Display, LED Bulb, Buzzer, 74HC595 these are the major components of circuit. In this circuit as our loop touches the zigzag wire circuit gets completed. The Touch of wire is acting as an Input and with the help of code for Arduino board, Digital pins are sending signal to Output Buzzer and LED bulb to turn them ON and also sends Signal to 7 segment LED so that it vary according to the code.

74HC595 is required to connect 7 segment LED display with Arduino board to work display according to code.

CODING

```
int latchPin = 3;                 // ST_CP [RCK] on 74HC595
int clockPin = 4;                 // SH_CP [SCK] on 74HC595
int dataPin  = 2;                 // DS [S1] on 74HC595


const int wire = 10;                      // The pin of the wire
const int led = 6;                        // Pin to be connected to the LED
const int buzzer = 8;                     // The pin of buzzer
const int fail_threshold = 9;             // The Threshold of failing
byte seg_digits[10] =      // The function which contains all the segment digits to display each number
{
  B00000011,  // = 0
  B10011111,  // = 1
  B00100101,  // = 2
  B00001101,  // = 3
  B10011001,  // = 4
  B01001001,  // = 5
```

```
  B01000001,  // = 6
  B00011111,  // = 7
  B00000001,  // = 8
  B00001001,  // = 9
};

enum Status       // To assign a constant to a name variable
{
  STOP = 0,       // Stop is assingned number 0
  GO = 1          // Go is assigned number 1
};

void displayDigit(int x)      // Function to display the number on the LED screen
{
   digitalWrite(latchPin, LOW);
   shiftOut(dataPin, clockPin, LSBFIRST, seg_digits[x]);
   digitalWrite(latchPin, HIGH);
}


void displayInitialSetup()    // The function consisting of display's initial setup
{
  pinMode(latchPin, OUTPUT);
  pinMode(dataPin, OUTPUT);
```

```
pinMode(clockPin, OUTPUT);
  displayDigit(0);
}
void beep()                    // Function to make the buzzer beep
{
  for(int i=0; i<2; i++)
  {
    digitalWrite(buzzer, HIGH);
    delay(50);
    digitalWrite(buzzer, LOW);
    delay(50);
  }
}
void failAlarm()               // Function to indicate the touching of wire(Failing)
{
    digitalWrite(led, HIGH);
    beep();
    delay(150);

    digitalWrite(led, LOW);
    digitalWrite(buzzer, LOW);
    delay(500);
}
```

```
void gameInitialSetup()                // Initializing game setup
{

  pinMode(led, OUTPUT);
  pinMode(buzzer, OUTPUT);

  pinMode(wire, HIGH);
  digitalWrite(led,LOW);
  digitalWrite(buzzer,LOW);
  digitalWrite(wire, LOW);
}

void setup() {

  Serial.begin(9600);
  displayInitialSetup();
  gameInitialSetup();
}

Status stat = GO;                      // Setting initial conditions
int failCounter = 0;                   // The variable to count the number of fails

void loop() {
```

```
while (failCounter > fail_threshold)   // To check whether the player has crossed the failing limit
 {
  gameover();
 }

switch (stat)                          // The loop of the game till the player fails
{
  case GO:                             // Case of not touching the wire(Non fail)
    digitalWrite(led, LOW);
    digitalWrite(buzzer, LOW);
    if (digitalRead(wire) == HIGH)
     {
       stat = STOP;
     }
    break;

  case STOP:                           // Case when the player touches the wire(Fails)
    failCounter++;
    if (failCounter > fail_threshold)
      break;
    displayDigit(failCounter);
    Serial.println(failCounter);
```

```
      failAlarm();
       stat = GO;
       break;
    }

}
void gameover()  // To make a significant difference from beeping when the game is over
{
  for (int i=0; i<2; i++)
  {
    digitalWrite(led,HIGH);
    digitalWrite(buzzer, HIGH);
    delay(5);
    digitalWrite(buzzer, LOW);
    digitalWrite(led,LOW);
    delay(50);
  }
}
```

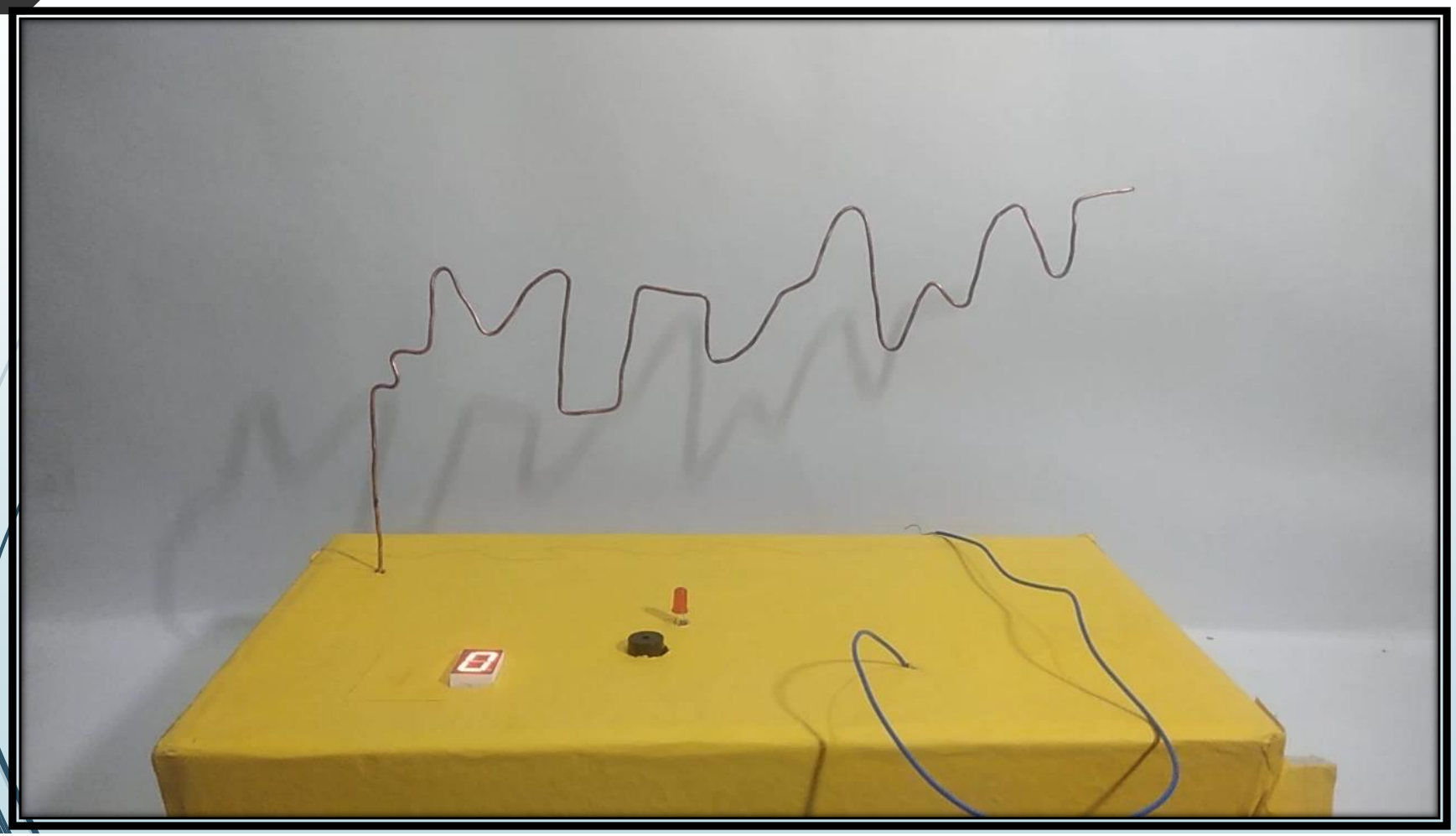
❑ Code in Arduino

❑ Code explanation

1. In the first part of the code we have defined integer variables based on the pins we have to attach.
2. Then functions are made for the following things :
    - Binary function to display digits on LED
    - Game and display initializing functions
    - Each fails alarm and Game over alarm

3. While and Switch loops are here used to determine the contact of the hoop and the wire

Working Model's Video



It's fun!!

REAL TIME APPLICATIONS

It improves hand and eye co-ordination

This game can be used in medical field by psychologists to test the overall concentration and consistency of a person

Acknowledgement

We are extremely grateful to all who helped us for making this project.

Thank you so much Mr. Bharat Naik for your support and help.

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