VSIT

Internet of Things
Practical #2

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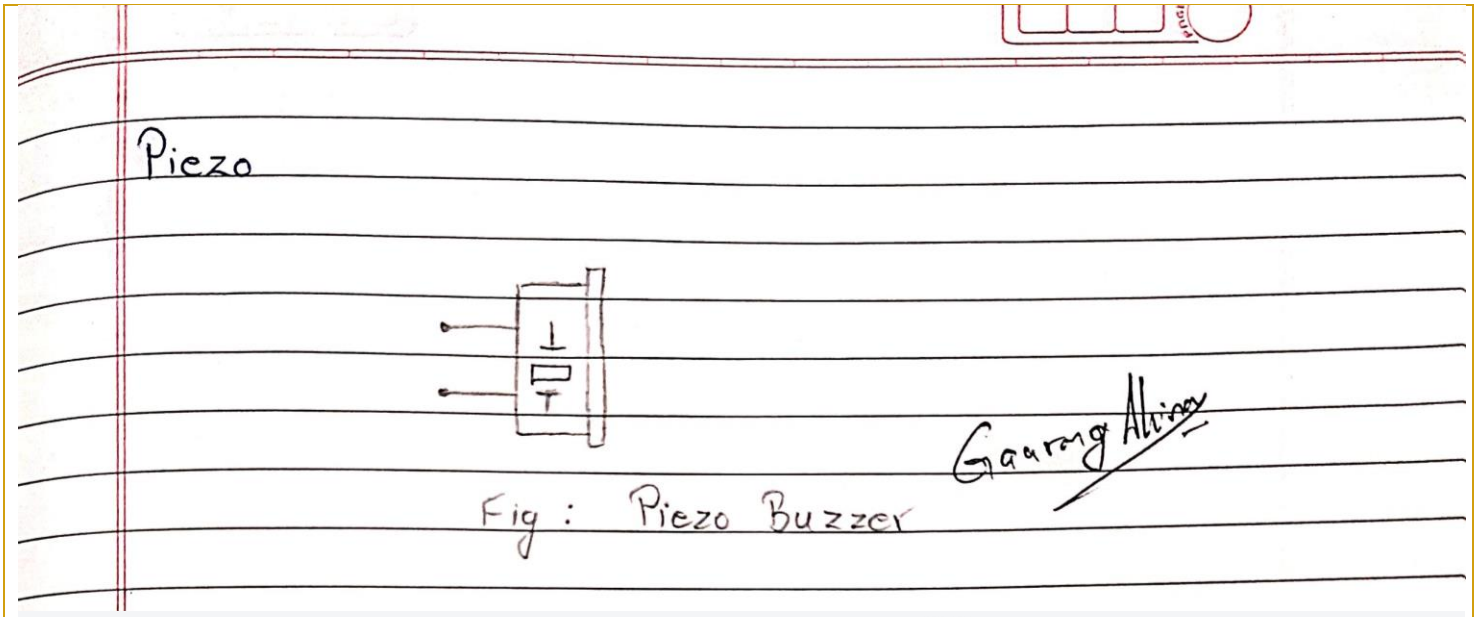
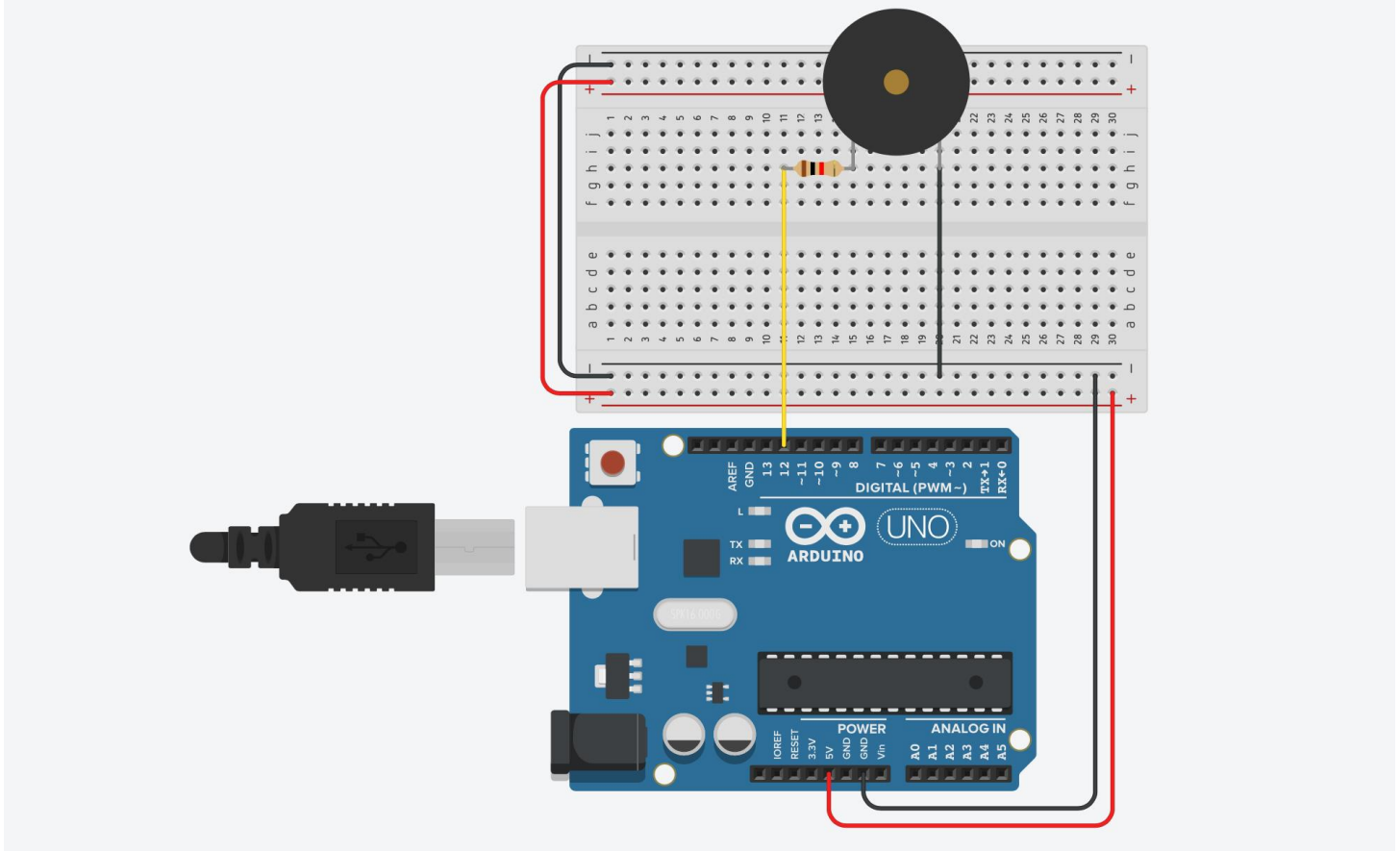
Class	T.Y.B.Sc.(I.T.)	**Roll Number**	19302E0023
Practical 1	Actuators used in IoT – Piezo Buzzer / 7 Segment Display / LCD Screen		
Objective	To understand the working and connection of Actuators when connected to Arduino		

Circuit Diagram – Piezo Buzzer.





Working of Piezo Buzzer.

Working :

- Piezo buzzer are simple device that can generate basic beeps and tones.
- They work by using a piezo crystal, a special material that changes shape when voltage is applied to it.
- If the crystal pushes against a diaphragm, like a tiny speaker cone, it can generate a pressure wave which the human ear picks up as sound.

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Program – Piezo Buzzer.

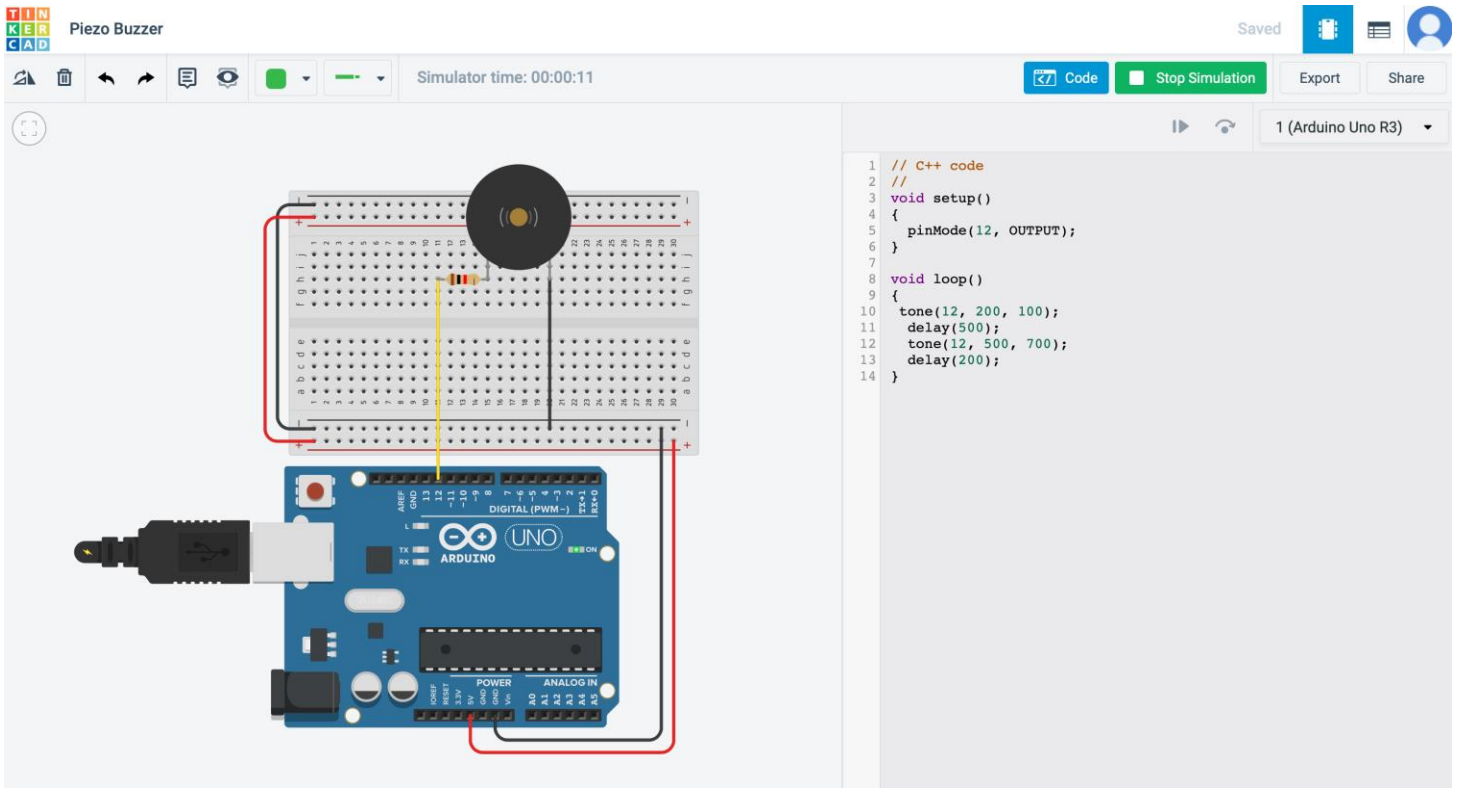
Text

1 (Arduino Uno R3)

```
// C++ code
//
void setup()
{
  pinMode(12, OUTPUT);
}

void loop()
{
 tone(12, 200, 100);
  delay(500);
  tone(12, 500, 700);
  delay(200);
}
```

Output – Piezo Buzzer.



Application of Piezo Buzzer in real life

Application.

- Alarm clock, Fire alarm, Microwave ovens, within Microphone, Ultrasonic equipments.
- In the Medical Industry it's used in stethoscope, pulse Measurement, Sleep Studies.

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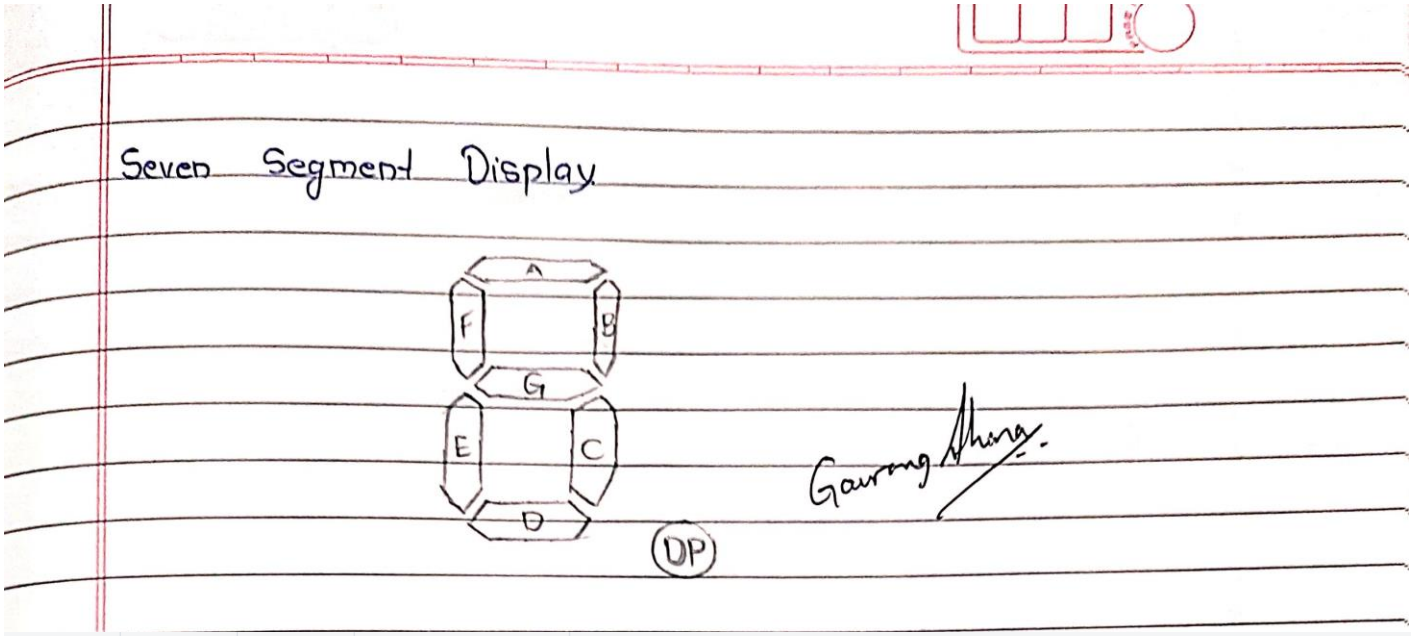
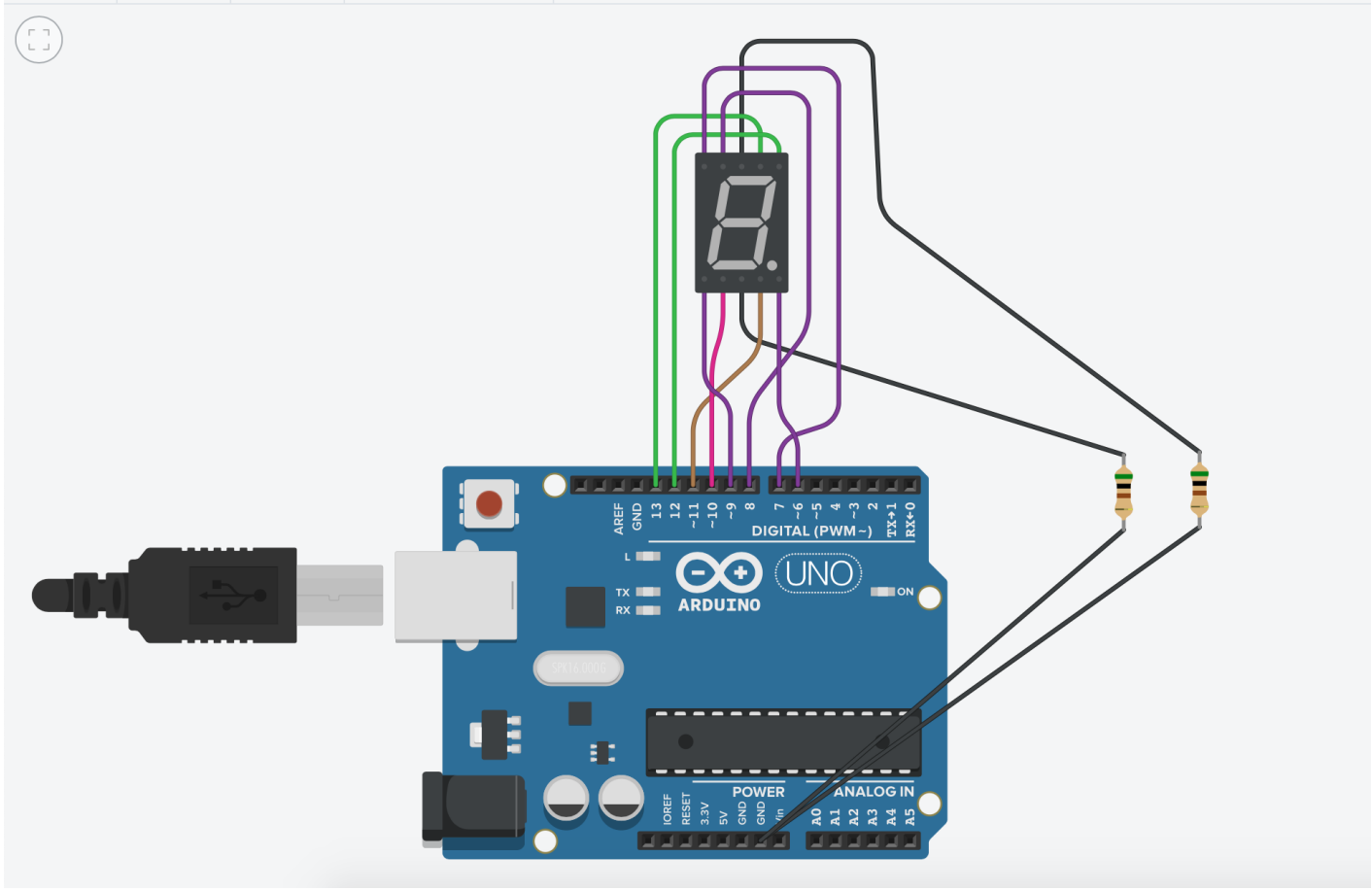
Circuit Diagram – 7 segment display.





Working of 7 segment display.

Working:

- A Seven-segment display is a form of electronic display device for displaying decimal numeral that is an alternative to the more complex dot matrix displays.
- 7 segment display are widely used in digital clock.
- Made up of seven different illuminating segments.

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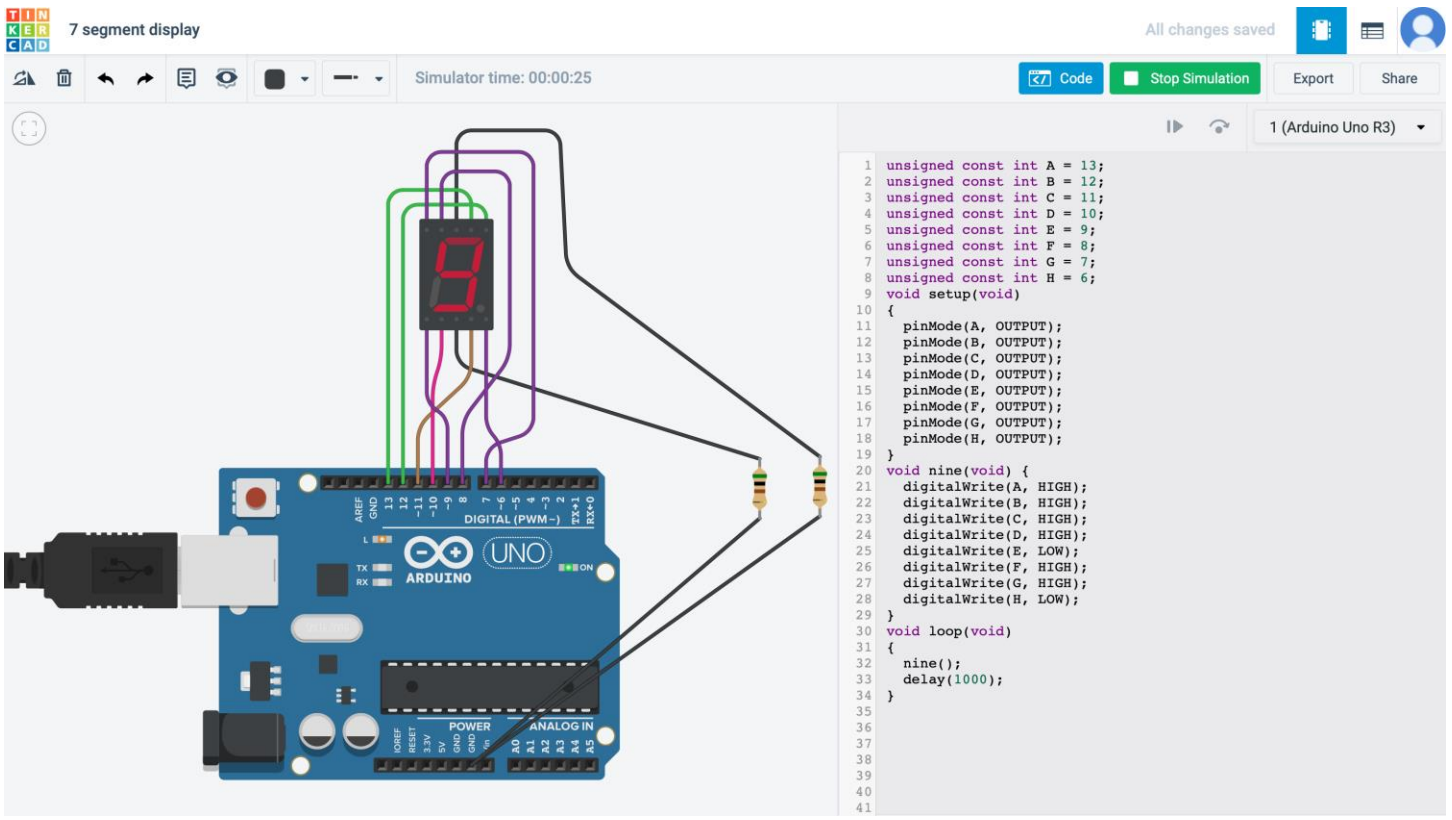
Program – 7 segment display.

Text

1 (Arduino Uno R3)

```
unsigned const int A = 13;
unsigned const int B = 12;
unsigned const int C = 11;
unsigned const int D = 10;
unsigned const int E = 9;
unsigned const int F = 8;
unsigned const int G = 7;
unsigned const int H = 6;
void setup(void)
{
  pinMode(A, OUTPUT);
  pinMode(B, OUTPUT);
  pinMode(C, OUTPUT);
  pinMode(D, OUTPUT);
  pinMode(E, OUTPUT);
  pinMode(F, OUTPUT);
  pinMode(G, OUTPUT);
  pinMode(H, OUTPUT);
}
void nine(void) {
  digitalWrite(A, HIGH);
  digitalWrite(B, HIGH);
  digitalWrite(C, HIGH);
  digitalWrite(D, HIGH);
  digitalWrite(E, LOW);
  digitalWrite(F, HIGH);
  digitalWrite(G, HIGH);
  digitalWrite(H, LOW);
}
void loop(void)
{
  nine();
  delay(1000);
}
```

Output – 7 segment display.



Application of 7 segment display in real life

Application:

- Widely used in electronic meter, basic calculator and other electronic device that display numeric information.
- Wristwatches.
- Also found in speedometer, motor vehicle odometer.
- Also used at railway station to display train Number
- Audio Frequency indicator.

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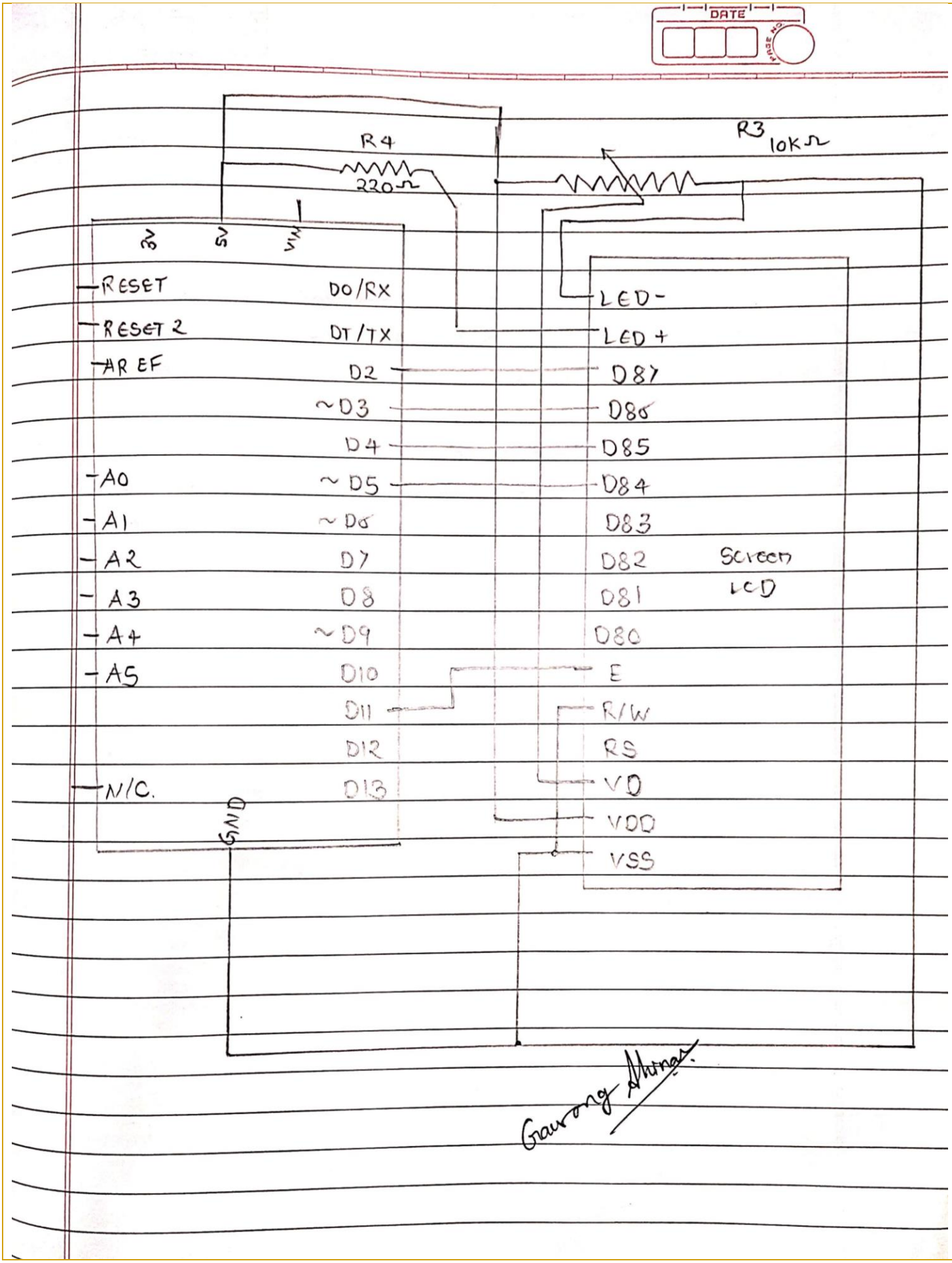
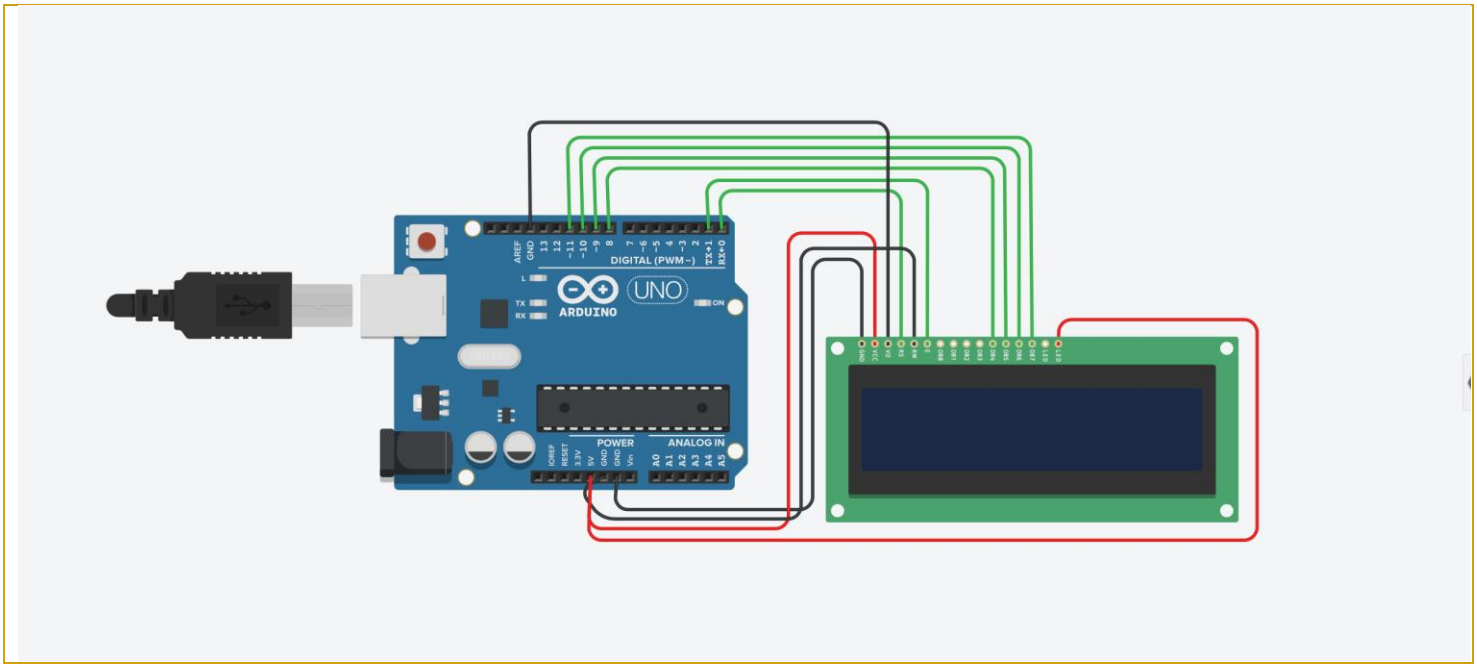
Circuit Diagram – LCD Screen.


R4
220Ω
R3
10KΩ
RESET
RESET 2
AREF
A0
A1
A2
A3
A4
A5
N/C.
D0/RX
D1/TX
D2
~D3
D4
~D5
~D6
D7
D8
~D9
D10
D11
D12
D13
GND
LED-
LED+
D87
D86
D85
D84
D83
D82
D81
D80
E
R/W
RS
VO
VDD
VSS
Screen
LCD
Gaurang Ahuja.



Working of LCD Screen.

Working :

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- A liquid crystal display is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystal combined with polarizers.
- LCD do not emit light directly, instead using a backlight or reflector to produce image in color or monochrome.

Program – LCD Screen.

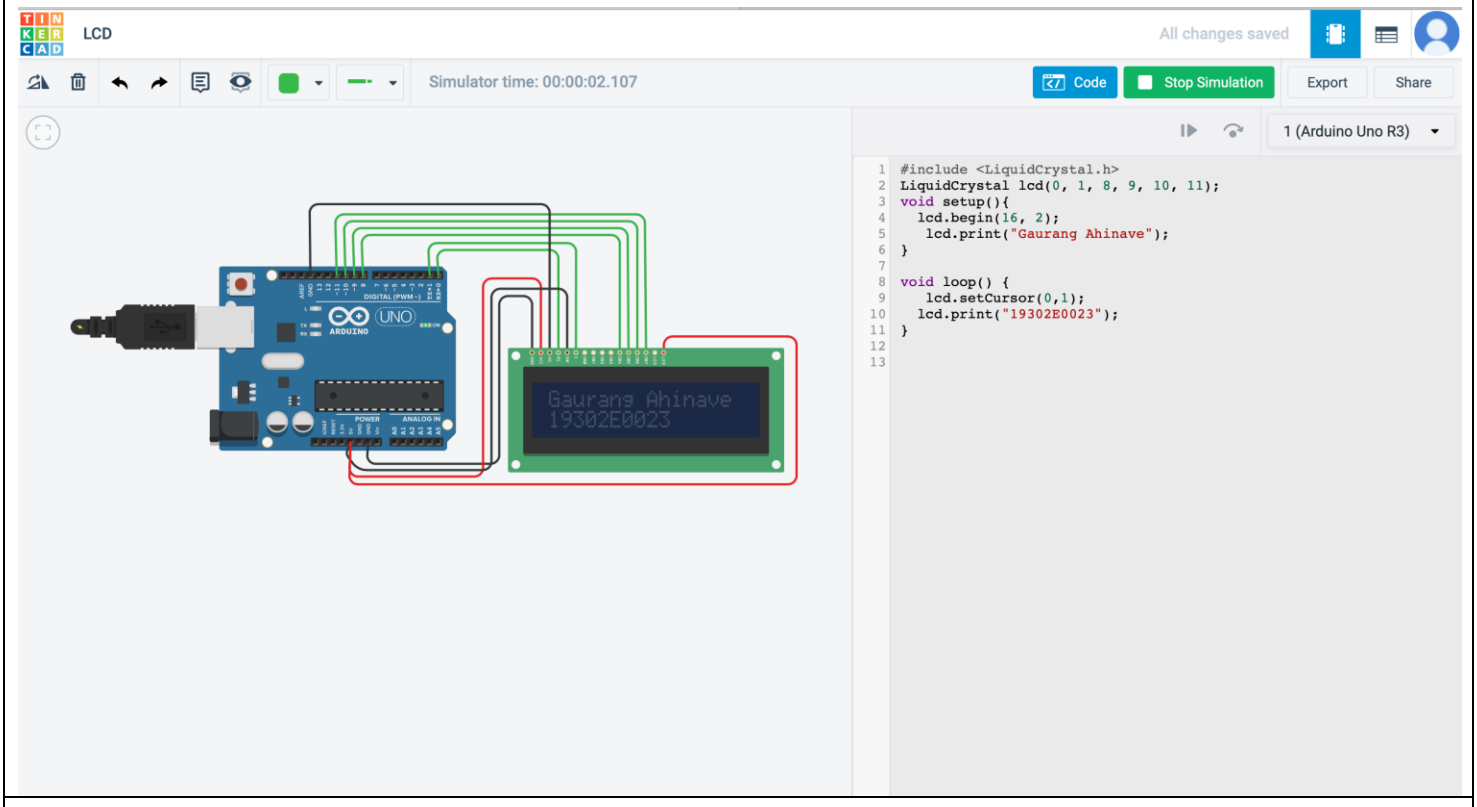
Code | Start Simulation | Export | Share

Text | 1 (Arduino Uno R3)

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(0, 1, 8, 9, 10, 11);
void setup(){
  lcd.begin(16, 2);
   lcd.print("Gaurang Ahinave");
}

void loop() {
   lcd.setCursor(0,1);
  lcd.print("19302E0023");
}
```

Output – LCD Screen.



Application of LCD Screen in real life

Application:

- Widely used in electronic meter, basic calculator and other electronic device that display numeric information.
- Wristwatches.
- Also found in speedometer, motor vehicle odometer.
- Also used at railway station to display train Number
- Audio frequency indicator.

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