Task: 3 **DETECTING THE AMBIENT LOUDNESS IN ENVIRONMENT USING ANALOG SOUND SENSOR**

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PROBLEM DEFINITION:

To detect and identify the ambient loudness in the environment using analog sound sensors and indicate with a buzzer sound and LED when a loudness is detected. The Arduino collects its output signal by imitating the input interface.

TOOLS USED:

Software - Arduino

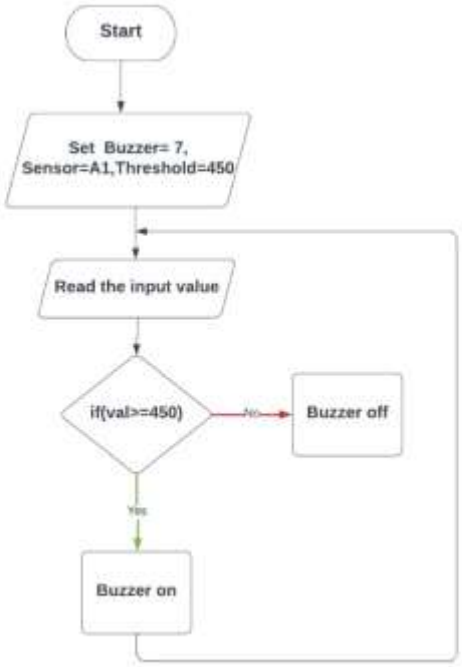
Hardware – Buzzer, LED and Analog sound sensor

Board – Intel Galileo

SENSOR DESCRIPTION:

An sound sensor is an instrument that detects the loudness in the environment by imitating the input interface. It detects sound waves through its intensity and converting it to electrical signals. Analog sound sensor consists of an in-built capacitive microphone, peak detector and an amplifier. With these components, it allows the sound waves propagate through air molecules. Such sound waves cause the diaphragm in the microphone to vibrate, resulting in capacitance change. Capacitance change is then amplified and digitalized for processing of sound intensity

FLOW CHART:



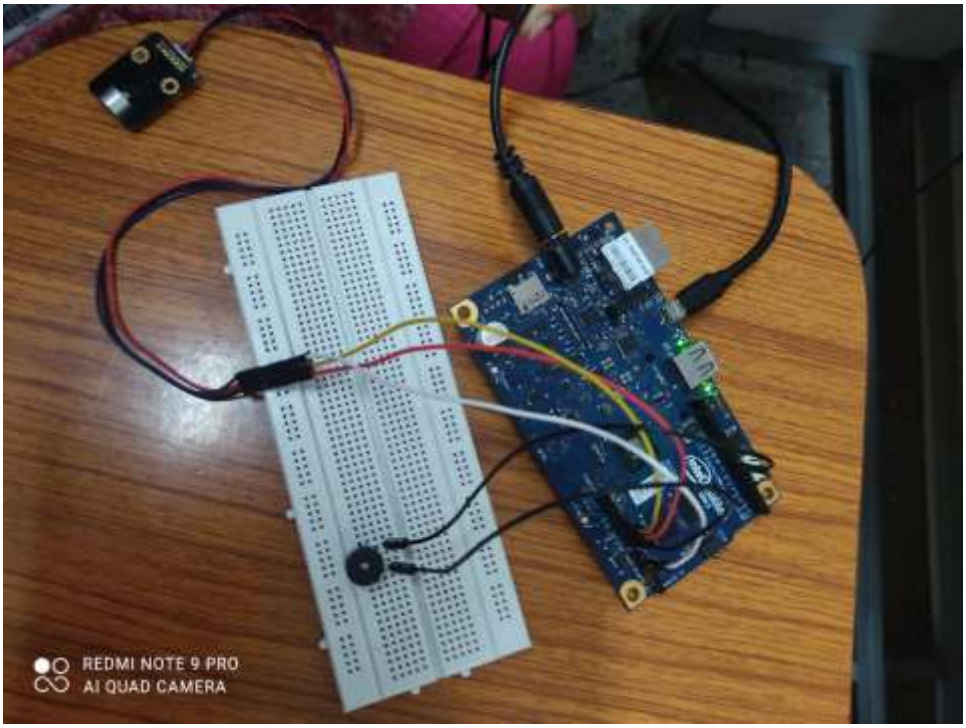
CODE:

```
int buzzer = 7;

boolean val = 0;

int threshold = 540;

void setup(){

  pinMode(buzzer, OUTPUT);

  Serial.begin (9600);

}

void loop (){

  val = analogRead(A1);
```

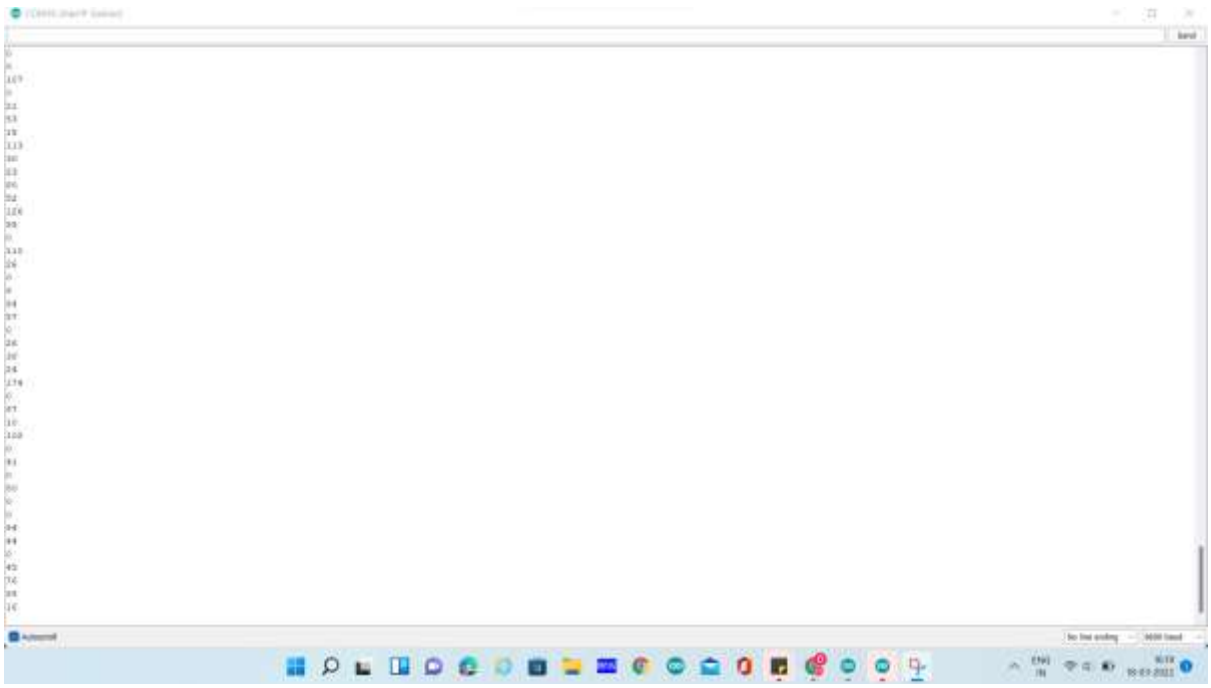
```
  Serial.println (val);
  Serial.println("Data");
  // when the sensor detects a signal above the threshold value, buzzer on
  if (val==HIGH) {
    digitalWrite(buzzer, HIGH);
  }
  else {
    digitalWrite(buzzer, LOW);
  }
}
```

SAMPLE INPUT AND OUTPUT:

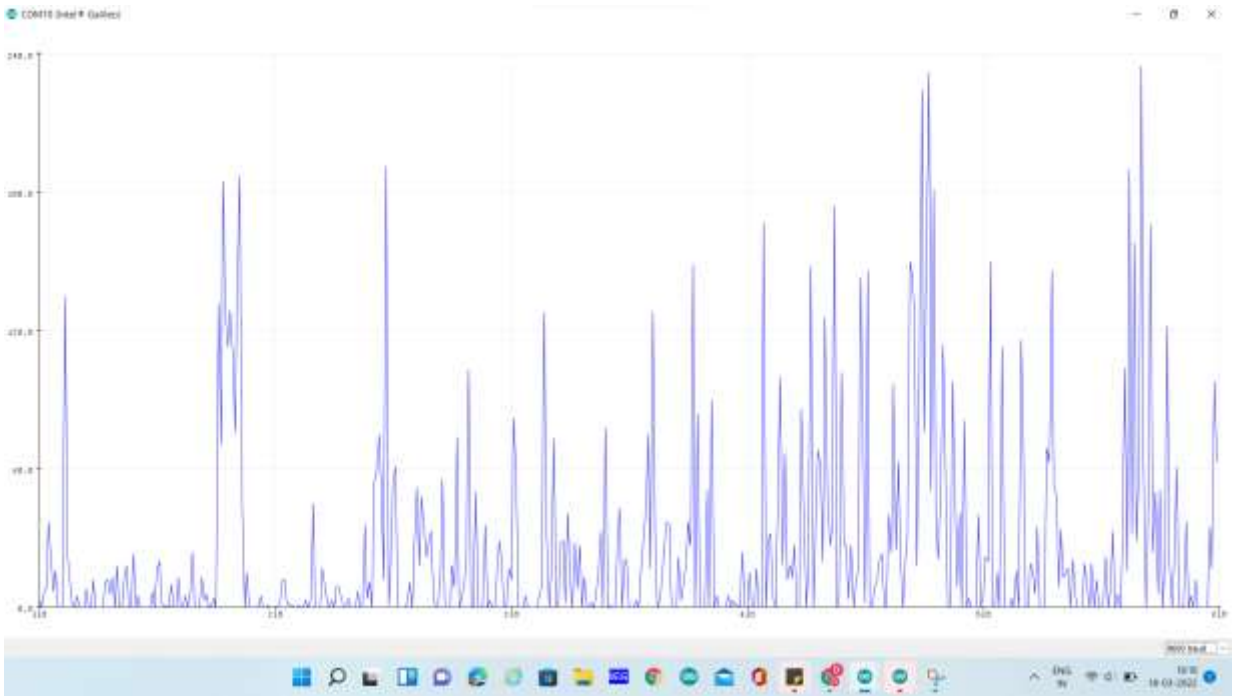
Buzzer sound when the analog sensor detects loudness in environment.



SERIAL MONITOR OF ANALOG SOUND SENSOR:



SERIAL PLOTTER OF ANALOG SOUND SENSOR:



REAL TIME APPLICATIONS:

- Sensor can be used in consumer electronics such as phones, computers, music systems.
- They are also used in Security and Monitoring systems such as burglar alarms, door alarm,etc.
- Home automation such as lighting your house by detecting whistle/clap instead of physically turning the light switch.
- Ambient sound recognition and sound level recognition.

CONCLUSION:

The circuit has been constructed using Intel Galileo board using analog sound sensor and the outputs of the loudness of environment are executed in the output peripherals like LED and buzzer.