Project Report

Earthquake Detect Simulation using Proteus

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CSE-331

Microprocessor Interfacing and Embedded System

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Introduction

Overview

An earthquake is an unpredictable natural disaster that causes damage to lives and property. It happens suddenly and It cannot stop it but it can be alerted and take precautions prior to some major vibrations on earth. So, I planned to make a project that can generally perform to study the detection of earthquakes.

Background & Motivation

The Main motive of our project is to detect earthquakes and alert people. It can warn people about the danger and take safety. A vibration sensation will occur whenever an earthquake is about to happen.

Methodology

This project works like an alarming system. Whenever an earthquake is about to happen a vibration sensation will immediately occur.

Tool Description

I used some tools to execute our project. I used a coding tool for the simulation part and I used a design platform as well.

Coding Platform

- Arduino IDE 2.0.3po

Design Platform

- Proteus 8.13
- Components & Library
    - Vibration Sensor
    - Arduino UNO
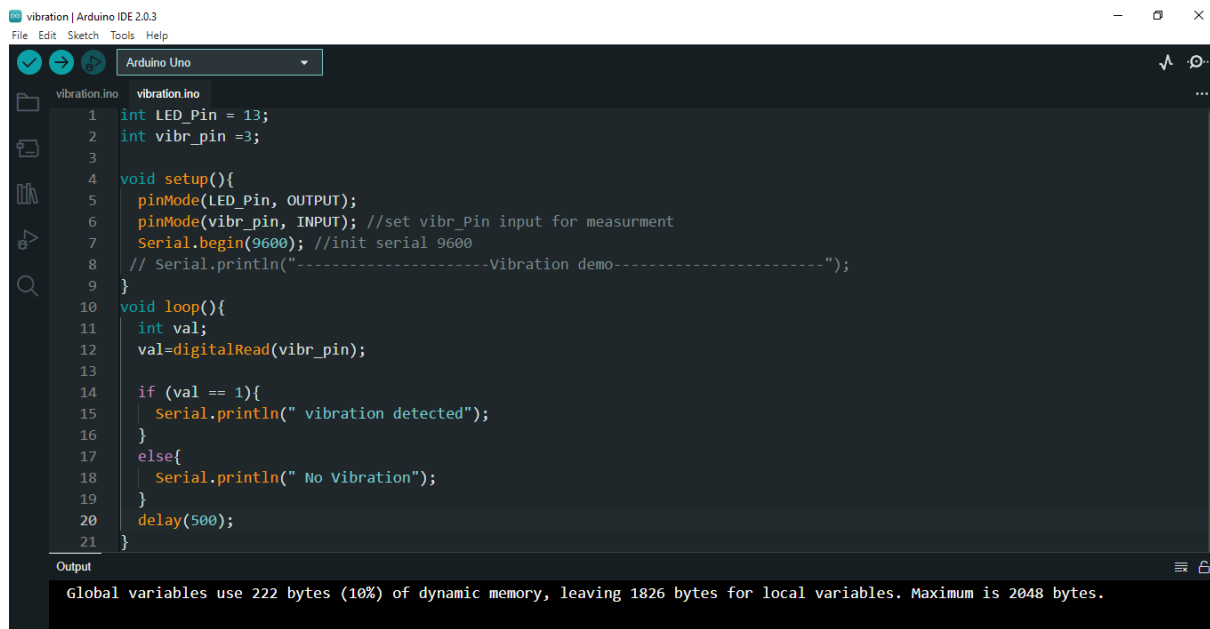
- ○ Logic Toggle
- ○ Virtual Terminal
- ○ Power
- ○ Wire

Software Implementation

Methodology for Software Part

The basic principle of work and warning earthquake detector with a vibration sensor. This is when an earthquake occurs or when the dynamo (earthquake simulator) is started, the resulting vibrations cause movement of the pendulum. This pendulum movement is what will trigger the sound of the bell. When the pendulum movement causes the pendulum in contact with the copper wire ring, then the electricity will flow toward the bell. When electricity flows into the bell, it will arise in the membrane vibration in the bell.

First, I wrote the code that controls the uno in the arduino ide.

Code:

```
vibration | Arduino IDE 2.0.3
File Edit Sketch Tools Help

Arduino Uno

vibration.ino    vibration.ino
1   int LED_Pin = 13;
2   int vibr_pin =3;
3
4   void setup(){
5     pinMode(LED_Pin, OUTPUT);
6     pinMode(vibr_pin, INPUT); //set vibr_Pin input for measurment
7     Serial.begin(9600); //init serial 9600
8   // Serial.println("----------------------Vibration demo----------------------");
9   }
10  void loop(){
11    int val;
12    val=digitalRead(vibr_pin);
13
14    if (val == 1){
15      Serial.println(" vibration detected");
16    }
17    else{
18      Serial.println(" No Vibration");
19    }
20    delay(500);
21  }

Output
 Global variables use 222 bytes (10%) of dynamic memory, leaving 1826 bytes for local variables. Maximum is 2048 bytes.
```

After that, install some library(arduino, vibration sensor) in proteus then placement components (VIBRATION SW-420, SIMULINO UNO,

LOGIC TOGGLE, POWER, VIRTUAL TERMINAL, GROUND) and connect with wire.

Then, import this code into the arduino component in the proteus board.
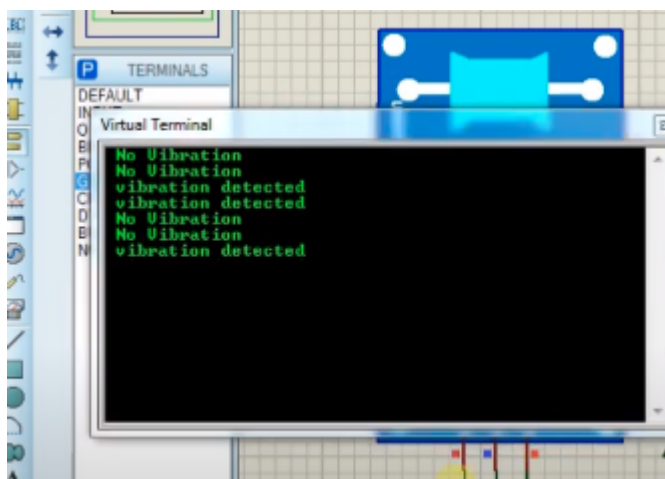
Project Simulation

I use a VIBRATION SW-420, SIMULINO UNO, LOGIC TOGGLE, POWER, VIRTUAL TERMINAL, GROUND for design in proteus.
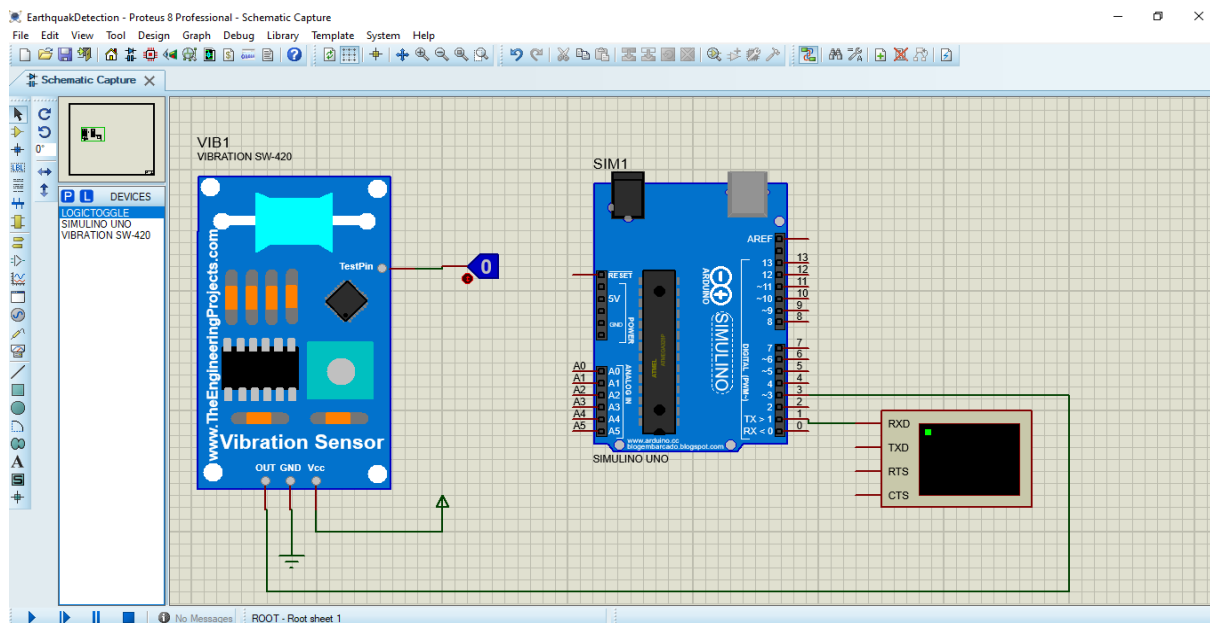
Simulation Results

When vibrated it is shown on the screen.

Hardware Implementation

Methodology for Hardware Part

In this circuit I need an arduino uno which is a microcontroller board, for the sensor I need piezoelectric accelerometer which is simply known as vibration sensor as the sensor will light an led so I will need a 5mm led and I will need a buzzer after that I will need a 100 ohm resistor and obviously I will need a breadboard and some jumped wires to connect the circuit.

Implementation Procedure

First I built the circuit, set the sensor on the breadboard then connected the vcc pin with the plus line which is the source of the breadboard and blue line is the ground and connected the middle point of the sensor which is ground and connected the digital output line with the arduino digital pin. Then connected the buzzer to ground and source and connected the source side with an arduino. Then I connected the led light with a 100 ohm resistor and connected the register and arduino with wire. For the power supply I connected our source part to the 5 volt port ground.
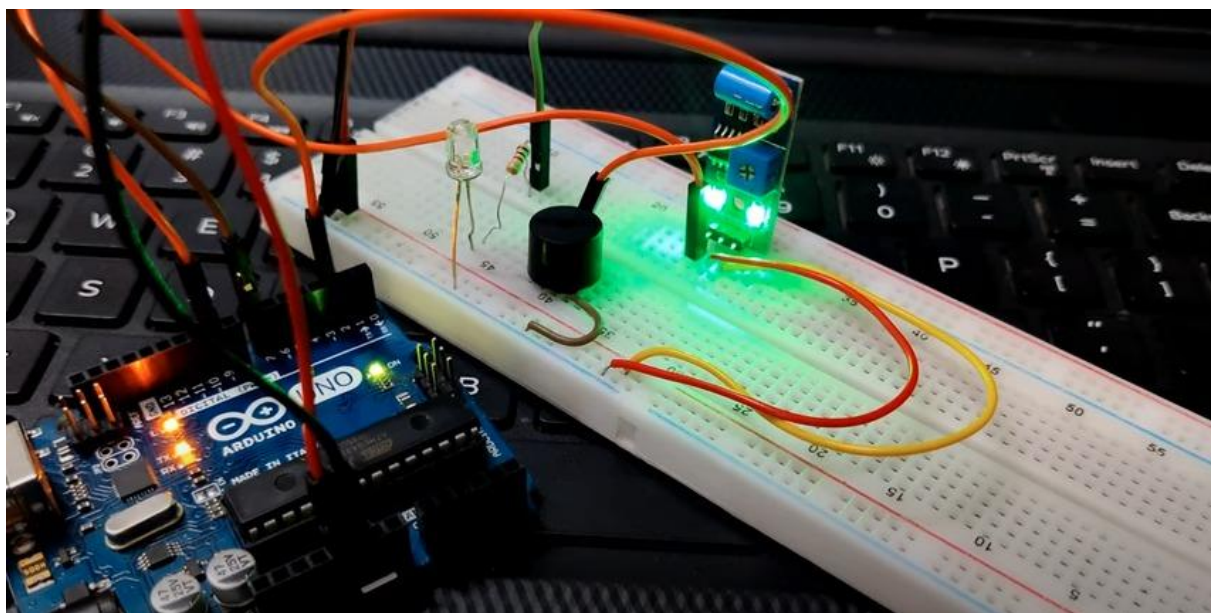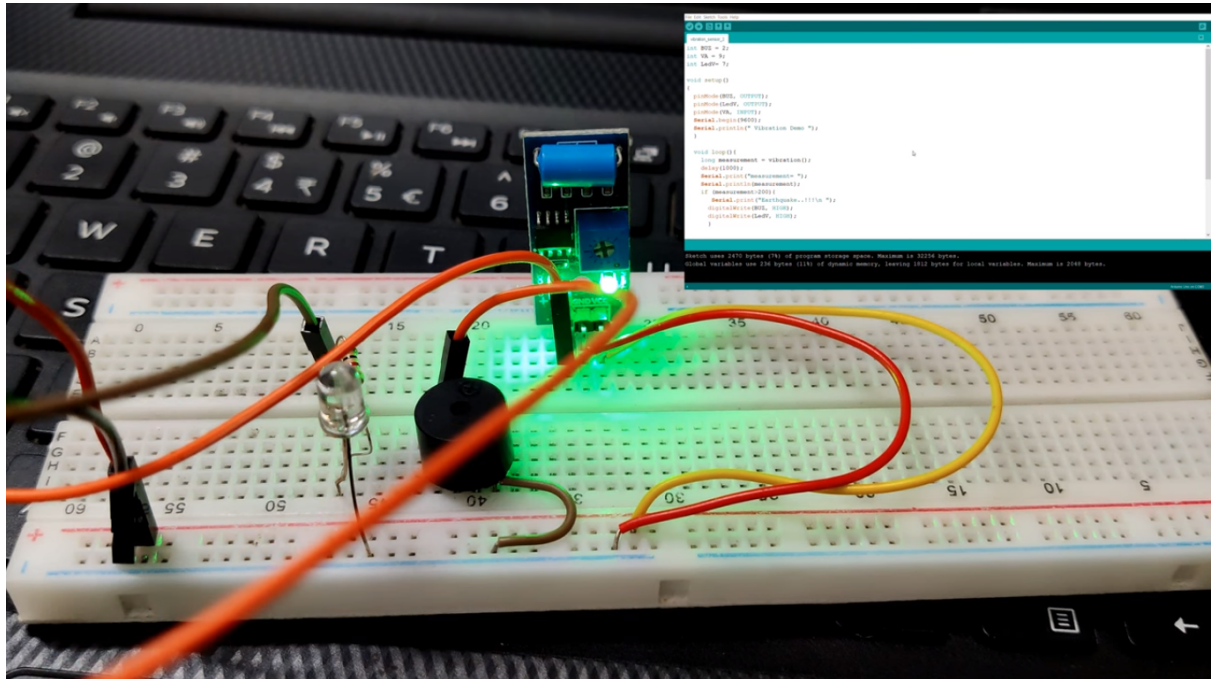
To turn on the system I connected the arduino port with arduino code which I wrote in arduino software.

Equipment

- Arduino
- Piezoelectric accelerometer (vibration sensor)
- LED light
- Register
- Buzzer
- Breadboard

- Wires

Demonstration

Conclusion

The working principle and warning earthquake detector with a vibration sensor this is when an earthquake occurs or when the dynamo (earthquake simulator) is started.

Reference

-Website Author Syed Zain Nasir syedzainnasir I am Syed Zain Nasir, Kisitu Ali Says: Soufiane Says: Chinthaka Liyanage Says: Talegeta Lulu Says: Lamesgin Says: Adamou Moussa Says: EMRE AKBAŞ Says: Sergey Says: Sk Says: Muhammad Faizan Ahmed Says: Pramanand Sah Says: Rockdomenik1105 Says: Jonathan001 Says: Indranath1 Says: A S P Uz Says: Radhikap Says: Intellisense Says: P120p Says: … Farhan Says: (2021, March 22). *New Proteus Libraries for engineering students*. The Engineering Projects. Retrieved December 23, 2022, from **https://www.theengineeringprojects.com/2016/08/new-proteus-libraries-engineering-students.html**

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