PROJECT REPORT

TITLE:VISUAL ASSIST

ABSTRACT:

The main aim of the project is to help visually impaired people to detect objects .The Object detector finds obstacle at half a metre distance and indicates it by sound.

It uses a sensor and Arduino uno in object detection and indication. A ultrasonic sensor is used to recognise obstacle . The time required for the sensor to receive the signal after hitting the obstacle is used to calculate the distance of the object . This is done by using ATmega328p micro controller.

When the distance is 0.5 metre, buzzer is activated. Thus, indicating presence of object. This project focusses to assist visually impaired both in indoor and outdoor environments. Hence helping them to lead a independent life.

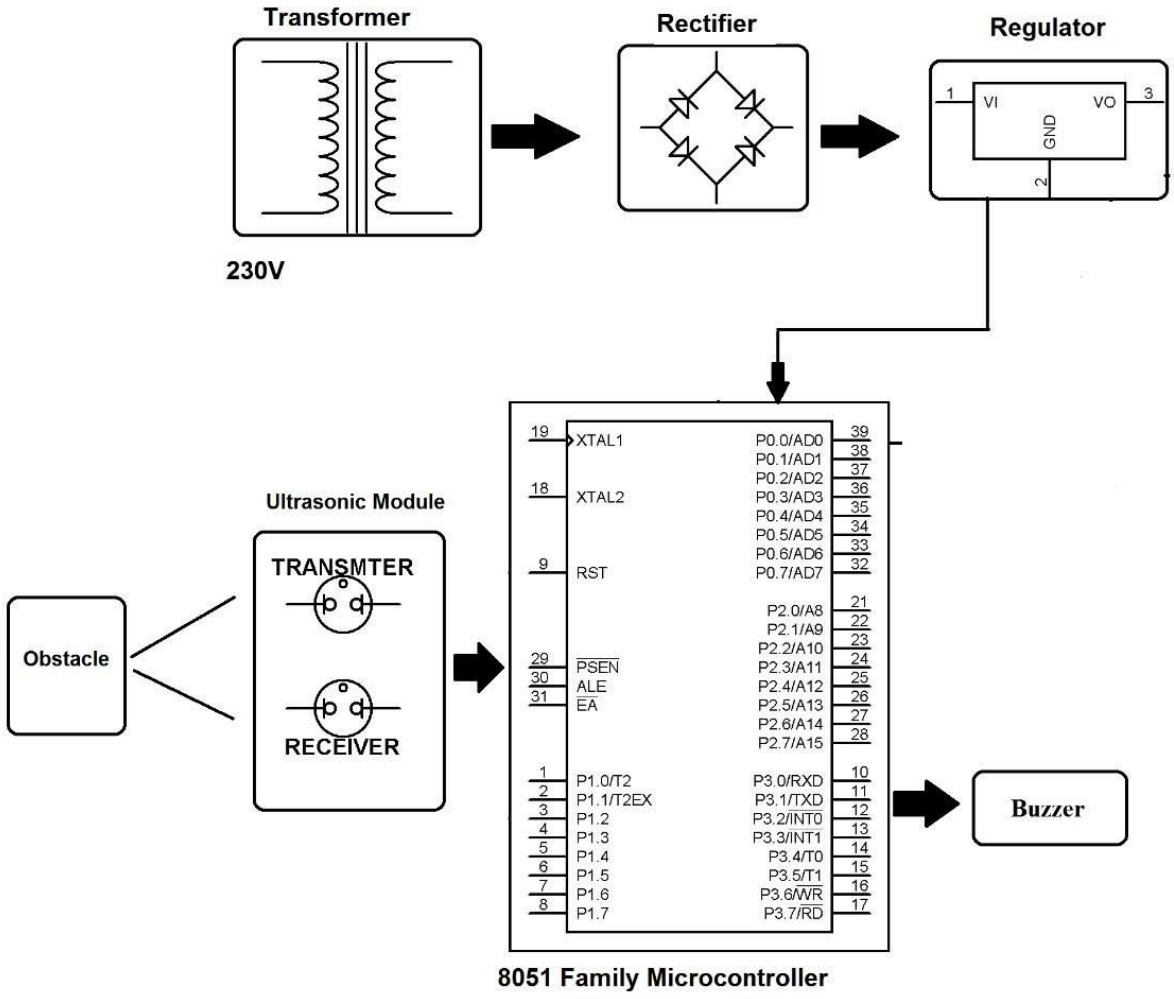
OBJECTIVE:

The purpose of the project is to assist visually impaired to find presence of object. It helps them in sensing the environment. Thus, offering them a independent life.

COMPONENTS USED:

1. Ultrasonic sensor(HC-SR04)
2. Arduino Uno
3. Buzzer

BLOCK DIAGRAM:



ARDUINO:

The Arduino board are equipped with sets of digital and analog (I/O) pins that may be interfaced to various expansion boards and programmed using C and C++.

Arduino UNO consist of an Atmel 8-bit AVR microcontroller ATmega328p. The boards use single or double-row pins or female headers that facilitate connections for programming and incorporation into other circuits . It include a 5 V linear regulator and 16 MHz crystal oscillator or ceramic resonator. Uno provide 14 digital I/O pins, six of

which can produce pulse width modulated signals, and six analog inputs, which can also be used as six digital I/O pins.

ULTRASONIC SENSOR:

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. It uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. High-frequency sound waves reflect from boundaries to produce distinct echo patterns.

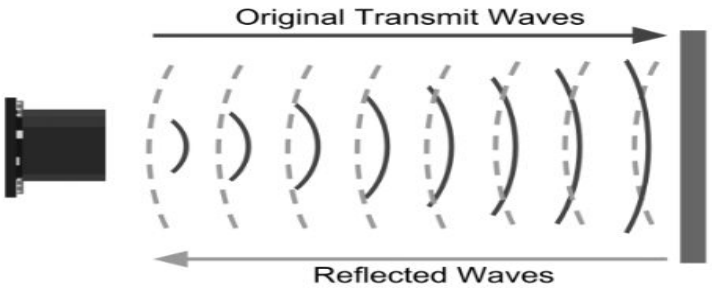
It has four pins: Vcc, Trig, Echo, and GND. The Vcc pin supplies the power to generate the ultrasonic pulses. The GND pin is connected to ground. The Trig pin is where the Arduino sends the signal to start the ultrasonic pulse. The Echo pin is where the ultrasonic range finder sends the information about the duration of the trip taken by the ultrasonic pulse to the Arduino.

WORKING:

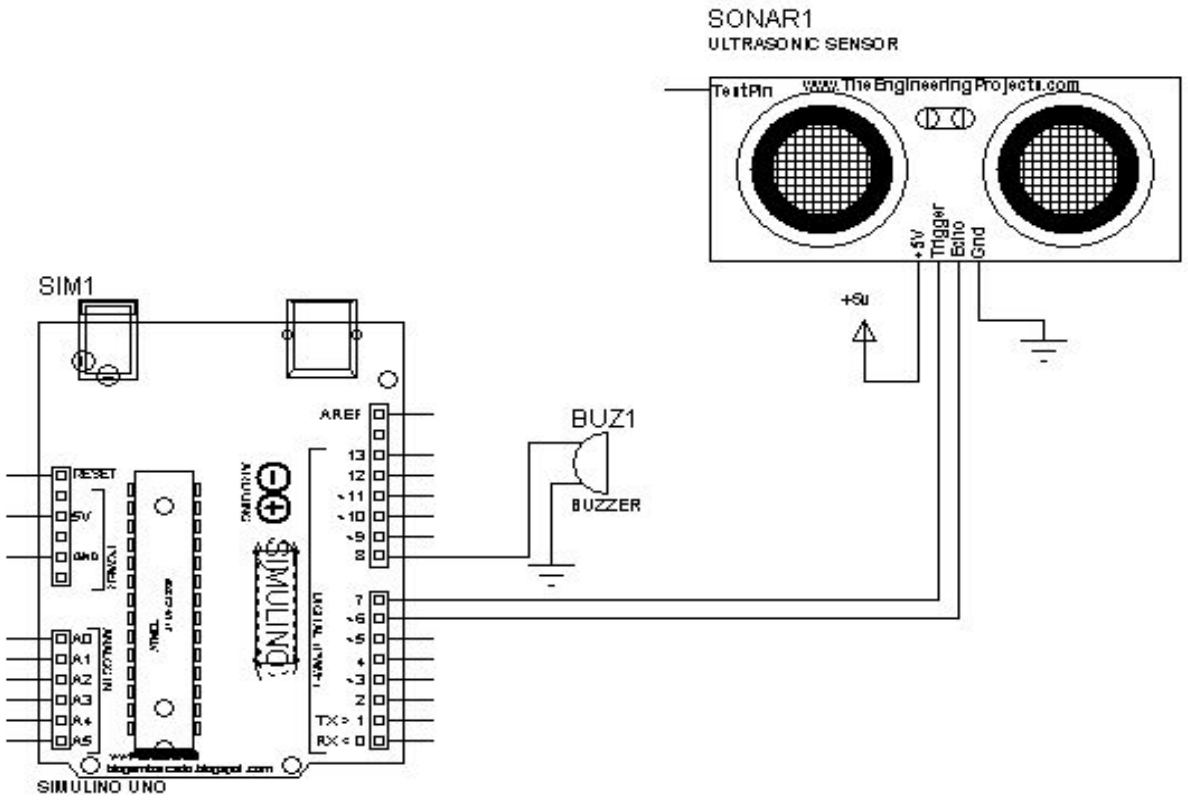
A 5V high signal is send to the Trig pin for at least 10 µs.Then the ultrasonic sensor sends an ultrasonic pulse out at 40 kHz which travels through the air and if there is an obstacle or object, it will bounce back to the sensor.

By calculating the travel time and the speed of sound, the distance can be calculated.

Distance(inches)=duration(microseconds)/74/2



CIRCUIT DIAGRAM:



CODE:

```
 const int triggerpin=7;
const int echopin=6;
const int buzzer=8;
void setup() {
   Serial.begin(9600);
}
void loop() {
  long duration,inch;
  pinMode(triggerpin,OUTPUT);
  digitalWrite(triggerpin,LOW);
  delayMicroseconds(2);
  digitalWrite(triggerpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(triggerpin,LOW);
  pinMode(echopin,INPUT);
  duration=pulseIn(echopin,HIGH);
  inch=Microseconds_To_Inches(duration);
  pinMode(buzzer,OUTPUT);
  Serial.print("distance    ")   ;
  Serial.print(inch);
  Serial.print("inch");
  Serial.println();
  delayMicroseconds(10);
  if(inch<610){
```

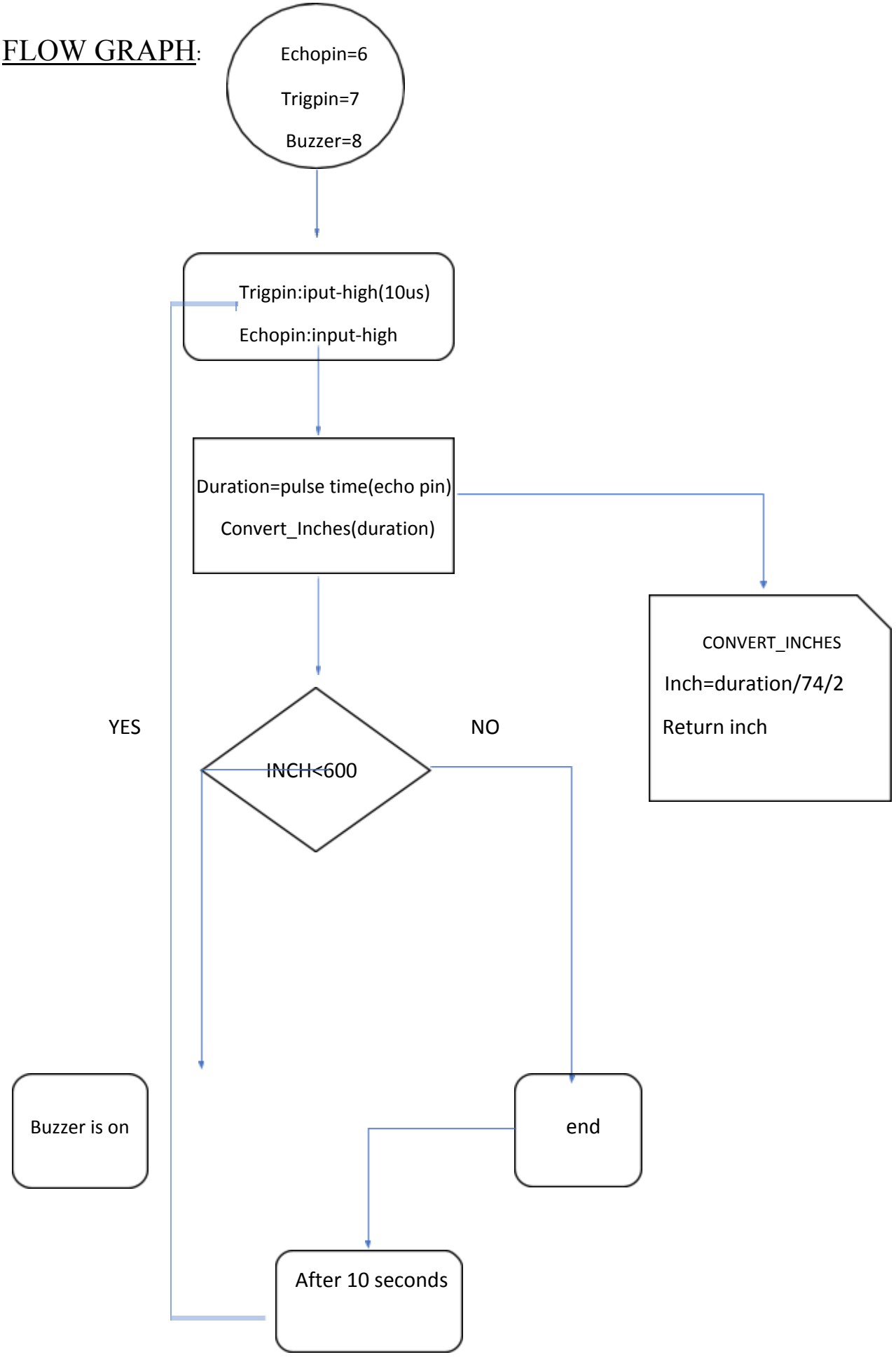
```
    Serial.print("ok");
    digitalWrite(buzzer,HIGH);
    delay(10000);
    digitalWrite(buzzer,LOW);
    delay(5000);}
}

long Microseconds_To_Inches(long microseconds)
{
  return microseconds/74/2;
}
```

ADVANTAGES:

- It accurately senses the obstacle distance at range of 800 cm.
- Cheaper than other visual assisting devices using computer vision
- Light weight and easy to wear

FLOW GRAPH:


Echopin=6
Trigpin=7
Buzzer=8
Trigpin:iput-high(10us)
Echopin:input-high
Duration=pulse time(echo pin)
Convert_Inches(duration)
CONVERT_INCHES
Inch=duration/74/2
Return inch
YES
INCH<600
NO
Buzzer is on
end
After 10 seconds