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UNIVERSITY OF MUMBAI

A PROJECT REPORT ON

BIDIRECTIONAL VISITOR COUNTER USING MICROCONTROLLER

Submitted in partial fulfilment of the requirements of the degree of

THIRD year of Bachelors of Engineering

By

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Under the Guidance of

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CERTIFICATE

This is to certify that

Meenakshi Uikey (16104A0042)

Prajakta Lonkar (16104A0068)

Prashast Yadav (16103A0010)

Have successfully completed the project titled

"Bidirectional Visitor Counter Using Microcontroller"

The project was undertaken as a part of the curriculum in partial fulfilment
of
T.E. Degree in Electronics & Telecommunication Engineering.

(University Of Mumbai)

For the Academic year 2018-2019

Internal Examiner External Examiner

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DECLARATION

We (Meenakshi Uikey, Prajakta Lonkar, Prashast Yadav) declare that this written submission represents our own ideas in our own words and where other's ideas or words have been used, we have adequately cited and referred the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/ data/ fact/ source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and also evoke penal action from the sources which have thus not been properly cited from whom proper permission has not been taken.

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ACKNOWLEDGEMENT

We take this opportunity to express our gratitude to the people who have helped us in the due course of making this report. We are thankful to our guide Prof. Atul Oak, for his suggestions and constructive criticism which has proved immensely helpful in the proper execution of the presented work and writing of this report. We are also thankful to Vidyalankar Institute of Technology, for providing us with infrastructure for fulfilment of our project requirements.

Lastly, we thank almighty, our parents, our family and friends for their constant encouragement.

Meenakshi Uikey (16104A0042)

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ABSTRACT

The project of "**Bidirectional visitor counter**" is based on the interfacing of some components such as sensors, motors etc. with arduino microcontroller. This counter can count people in both directions. This circuit can be used to count the number of persons entering a hall/mall/home/office in the entrance gate and it can count the number of persons leaving the hall by decrementing the count at exit gate and it depends upon sensor placement in mall/hall. It can also be used at gates of parking areas and other public places.

INTRODUCTION

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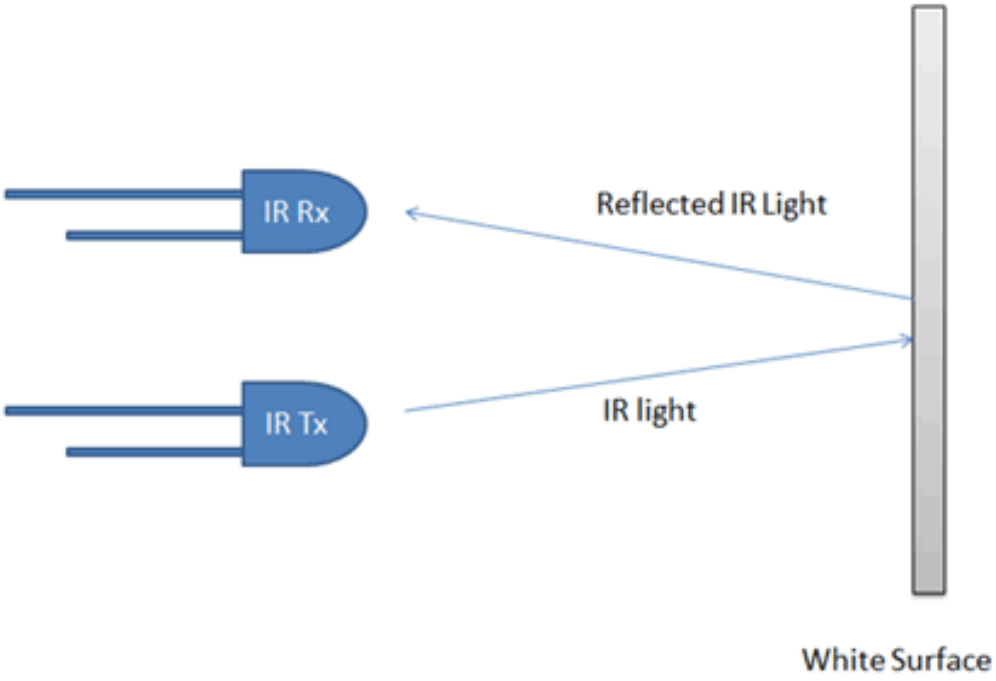
This project is divided in four parts: sensors, controller, counter display and gate. The sensor would observe an interruption and provide an input to the controller which would run the counter increment or decrement depending on entering or exiting of the person. And counting is displayed on a 16x2 LCD through the controller.

When any one enters in the room, IR sensor will get interrupted by the object then other sensor will not work because we have added a delay for a while.



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REQUIREMENTS

1) IR Sensor Modules
2) Arduino Uno Microcontroller
3) 10k Potentiometer
4) 5V Battery
5) 220 ohms resistor
6) Breadboard
7) Connecting wires
8) PC with Arduino software

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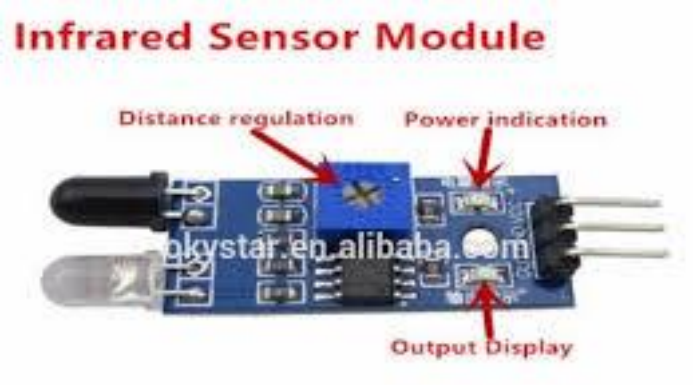
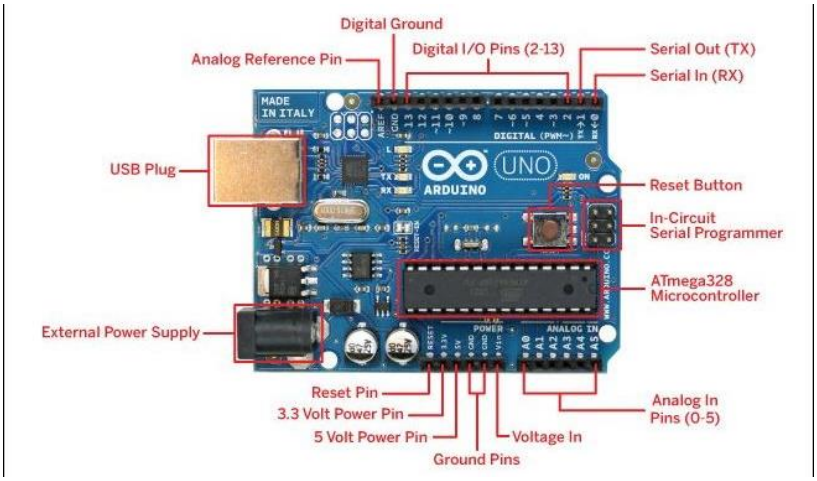
CIRCUIT EXPLANATION

There are some sections of whole visitor counter circuit that are sensor section, control section, display section and driver section.

1)Sensor section: In this section we have used two IR sensor modules which contain IR diodes, potentiometer, Comparator (Op-Amp) and LED's. Potentiometer is used for setting reference voltage at comparator's one terminal and IR sensors sense the object or person and provide a change in voltage at comparator's second terminal. Then comparator compares both voltages and generates a digital signal at output.



2)Control Section: Arduino UNO is used for controlling whole the process of this visitor counter project. The outputs of comparators are connected to digital pin number 14 and 19 of arduino. Arduino read these signals and send commands to relay driver circuit to drive the relay for light bulb controlling.



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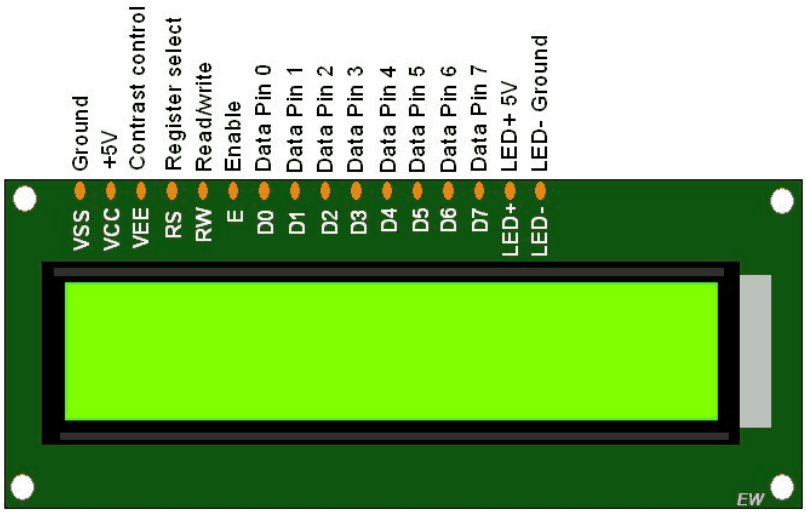
3) Display section: Display section contains a 16x2 LCD. This section will display the counted number of people.



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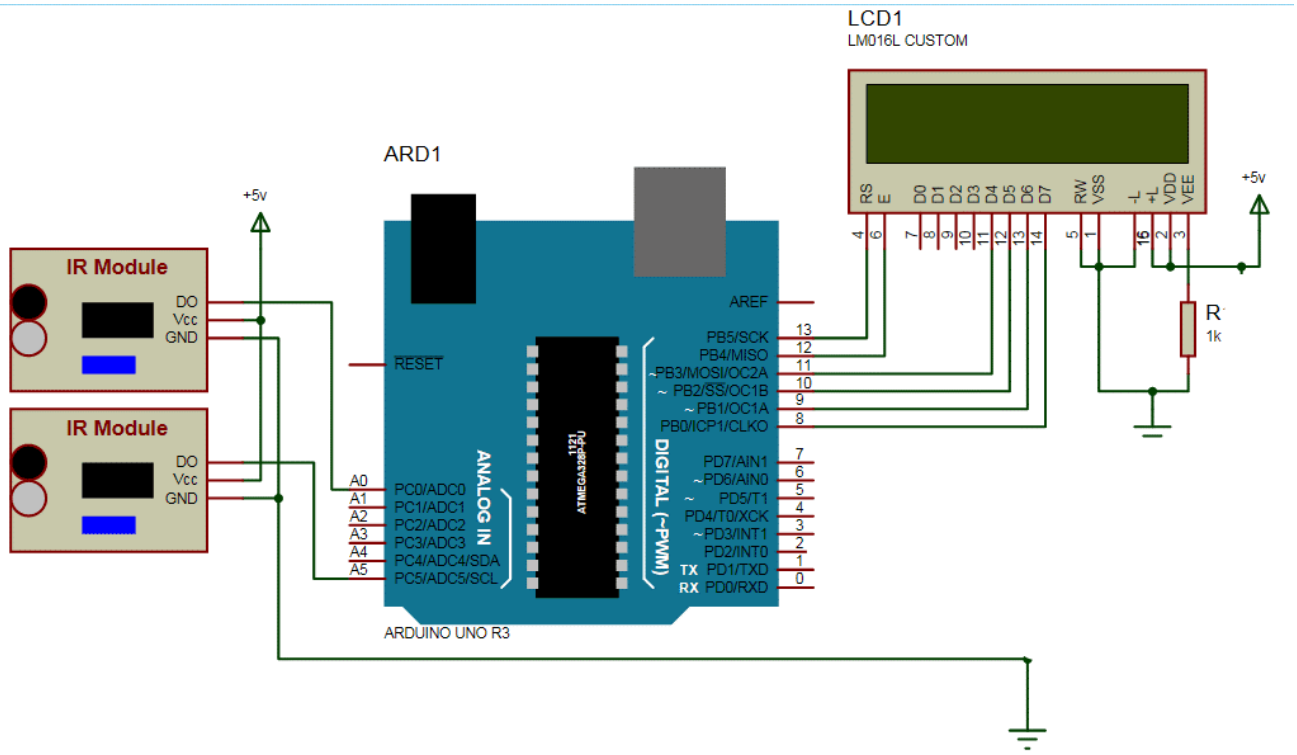
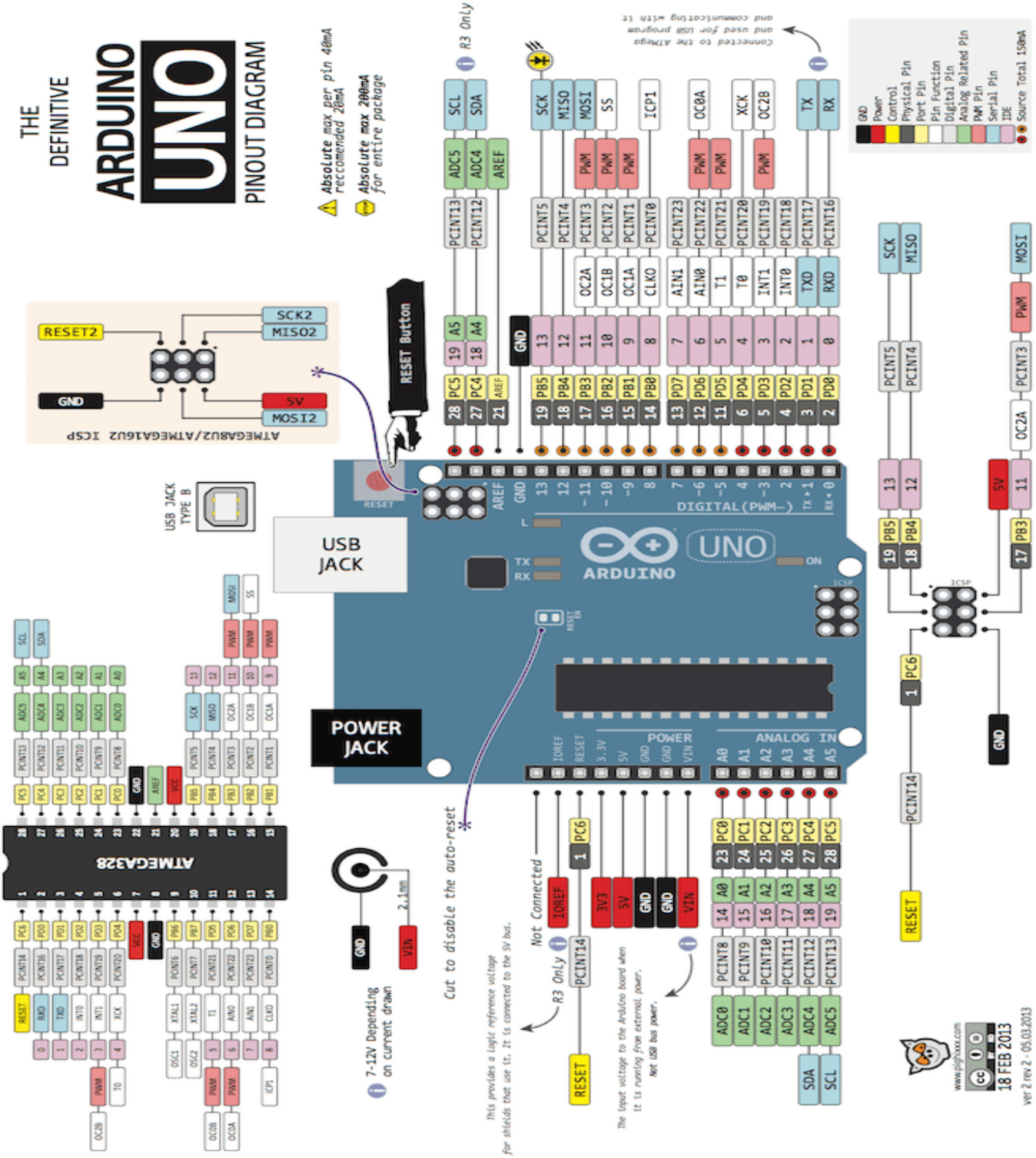
VISITOR COUNTER CIRCUIT DIAGRAM

The outputs of IR Sensor Modules are directly connected to arduino digital pin number 14(A0) and 19(A5). LCD is connected in 4 bit mode. RS and EN pin of LCD is directly connected at 13 and 12. Data pin of LCD D4-D7 is also directly connected to arduino at D11-D8 respectively. Rest of connections are shown in the below circuit diagram.



ARDUINO UNO PINOUT



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CODE

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(13,12,11,10,9,8);
#define in 14
#define out 19
int count=0;

void IN()
{
   count++;
   lcd.clear();
   lcd.print("Person In Room:");
   lcd.setCursor(0,1);
   lcd.print(count);
   delay(1000);
}

void OUT()
{
  count--;
   lcd.clear();
   lcd.print("Person In Room:");
   lcd.setCursor(0,1);
   lcd.print(count);
   delay(1000);
}

void setup()
{
  lcd.begin(16,2);
  lcd.print("Visitor Counter");
  delay(2000);
  pinMode(in, INPUT);
  pinMode(out, INPUT);
  lcd.clear();
  lcd.print("Person In Room:");
  lcd.setCursor(0,1);
```

```
`
  lcd.print(count);
}

void loop()
{
    int  up=digitalRead(in);
  if(up==0)
  IN();
  int  down=digitalRead(out);
  if(down==0)
  OUT();

  if(count<=0)
  {
    lcd.clear();
    count=0;
    lcd.print("Nobody In Room");
    delay(800);
  }
}
```

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CONNECTIONS

- The analog pins A0 and A5 of Arduino UNO are connected to the data pins of IR sensors for UP and DOWN counting respectively.
- The digital pins 8, 9, 10, 11 of Arduino are connected to pins 14, 13, 12, 11 of LCD display respectively.
- Pins 1 and 15 of LCD display are connected to ground.
- Pins 2 and 16 of LCD display are connected to VCC.
- The centre pin of potentiometer is connected to pin 3 of LCD
- Other 2 ends of the potentiometer are connected to VCC and ground.
- A resistor of 220 ohms is connected between the pin 15 of LCD display and VCC.

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CONCLUSION

This project gave us an idea as to how the Arduino UNO microcontroller is used in making a bidirectional counter. It made us know as to how the program should be tested and also how to rectify the faults in them.

The main focus of this work was to design a bidirectional counter to display the number of people present in a room.

We learnt a software which was required to make this project work: Arduino required for making program.

As a result, after all the trial and error, we have successfully completed our Semester 6 Mini project.

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PROJECT EXPENDITURE

SR.NO.	PARTICULARS	QUANTITY	AMOUNT
1	Arduino UNO	1	450
2	Potentiometer	1	10
3	9V Battery	1	15
4	Battery clip	1	5
5	Arduino cable	1	50
		TOTAL	520