# TITLE

## PREDICTION OF AIR AND NOISE POLLUTON LEVEL USING IOT

### MEMBERS

1) SOHAN DAS (20BEE0330)
2) PRITHWISH PRADHAN (20BEE0026)

# INTRODUCTION

▶ One of the major issues which humans are facing these days is pollution, which includes air, water, sound, etc. Air and sound pollution has caused many health-related issues like illness, high blood pressure, hearing loss, sleep disruption, heart disease and lung cancer, etc.

▶ So, it is necessary to monitor and control air and sound quality so that we can live a healthy and better life. Hence, we are proposing this project to monitor air and sound quality of a particular area through IOT.

▶ With the help of this system, authorities can keep a look on air and noise pollution near hospital or school areas and can take required steps.

# LITERATURE REVIEW

| TITLE | JOURNAL NAME AND YEAR | HIGHLIGHTS |
| --- | --- | --- |
| Air and Noise Pollution Monitoring in the City of Zagreb by Using Mobile Crowdsensing. | Conference Paper · September 2017 | In this journal, it is shown that a category of smart city services for mobile community sensing which share sensor data on the move in urban environments known as Mobile Crowdsensing (MCS). Users carry their mobile phones and continuously collect sensor readings. The data is first preprocessed on mobile devices and then sent to cloud servers which run an MCS service on further processing. |
| IoT enabled Environmental Air Pollution Monitoring. | IOP Conference Series: Materials Science and Engineering Published in 2020. | In this work carbon monoxide and other pollutant gas level is measured in the form of PPM and it is transmitted through GPRS. The collected data through the sensor will be converted into a digital format and transmitted by any network. Sequential modelling framework has been proposed in order to monitor and predict the air pollution status. |

# LITERATURE REVIEW

| TITLE | JOURNAL NAME AND YEAR | HIGHLIGHTS |
|---|---|---|
| IoT-based air quality monitoring systems for smart cities: A systematic mapping study. | International Journal of Electrical and Computer Engineering (IJECE) Vol. 11, No. 4, August 2021 | In this study, they have developed a systematic mapping study based on some guidelines. Five steps were defined to identify and analyze studies related to IoT-based air pollution monitoring systems for smart cities. Particularly, they used the internet of things (IoT) to interconnect the sensors in order to measure different pollutants. |

# -:WORK IDENTIFIED:-

▶ Air pollution monitoring unit has been developed with the help of wireless sensor network and the sensor network gives the information about the pollution level of a certain area by using a centralized server to internet for any telecom network.

▶ In this work carbon monoxide and other pollutant gas level is measured in the form of PPM and it is transmitted through GPRS and the location is transmitted using global positioning system. The collected data through the sensor will be converted into a digital format and transmitted by any network can be represented on http link and create an APK file application presentation of this data.

▶ Sequential modelling framework has been proposed in order to monitor and predict the air pollution status which has been caused due to rapid urbanization. In this framework the air quality is measured by estimating the values of particulate matter and nitrogen dioxide using wireless sensor network and the prediction of air pollution is done by using the historical air quality and meteorological data. In this way , we have predicted the air pollution level using IOT.
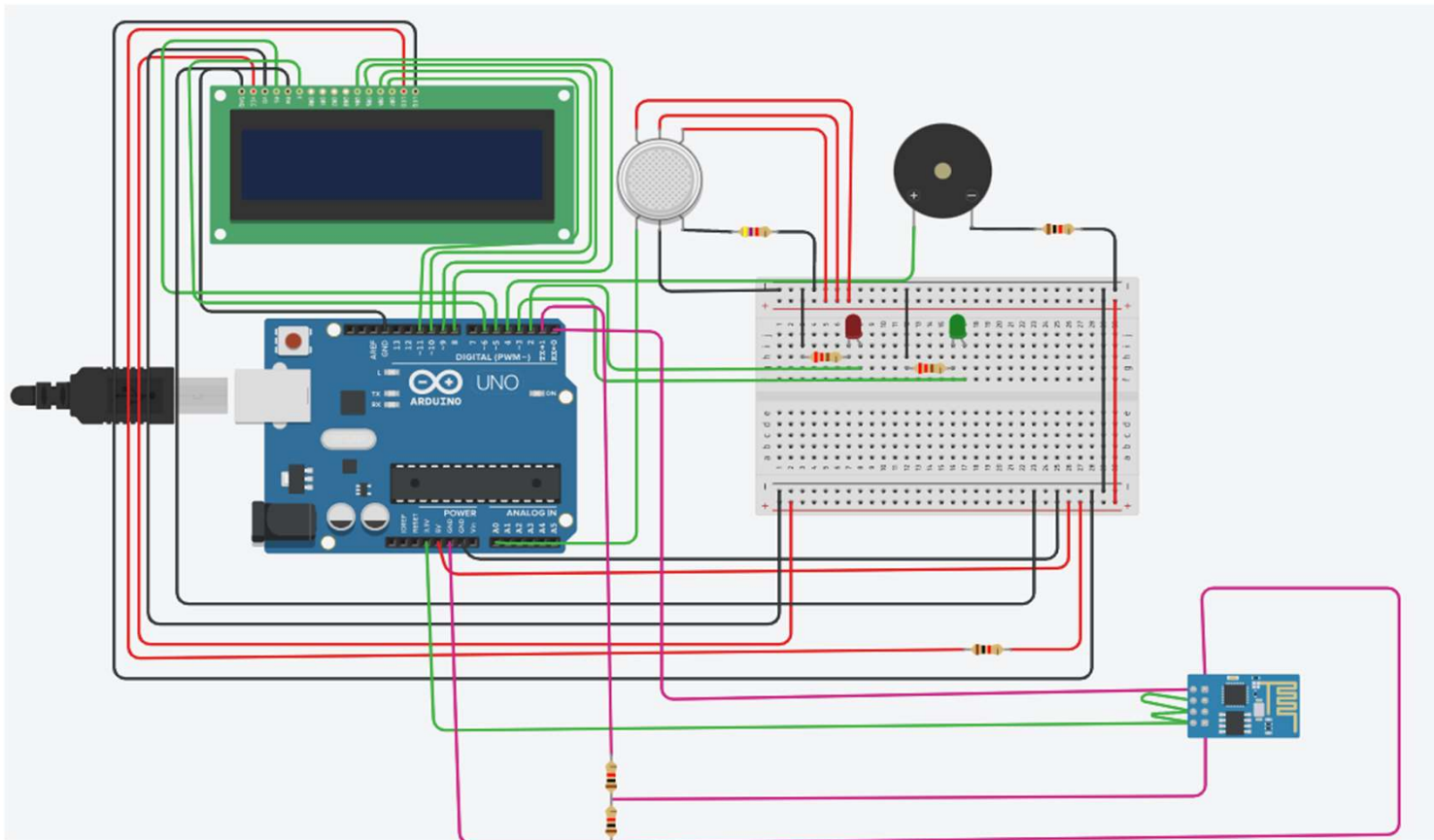
# REQUIREMENTS

► **Hardware Components**

► Arduino Uno

► Air sensor (MQ135)

► Sound sensor (LM393)

► LCD

► Buzzer

► LED

► Wi-Fi Modem

► **Software Component**

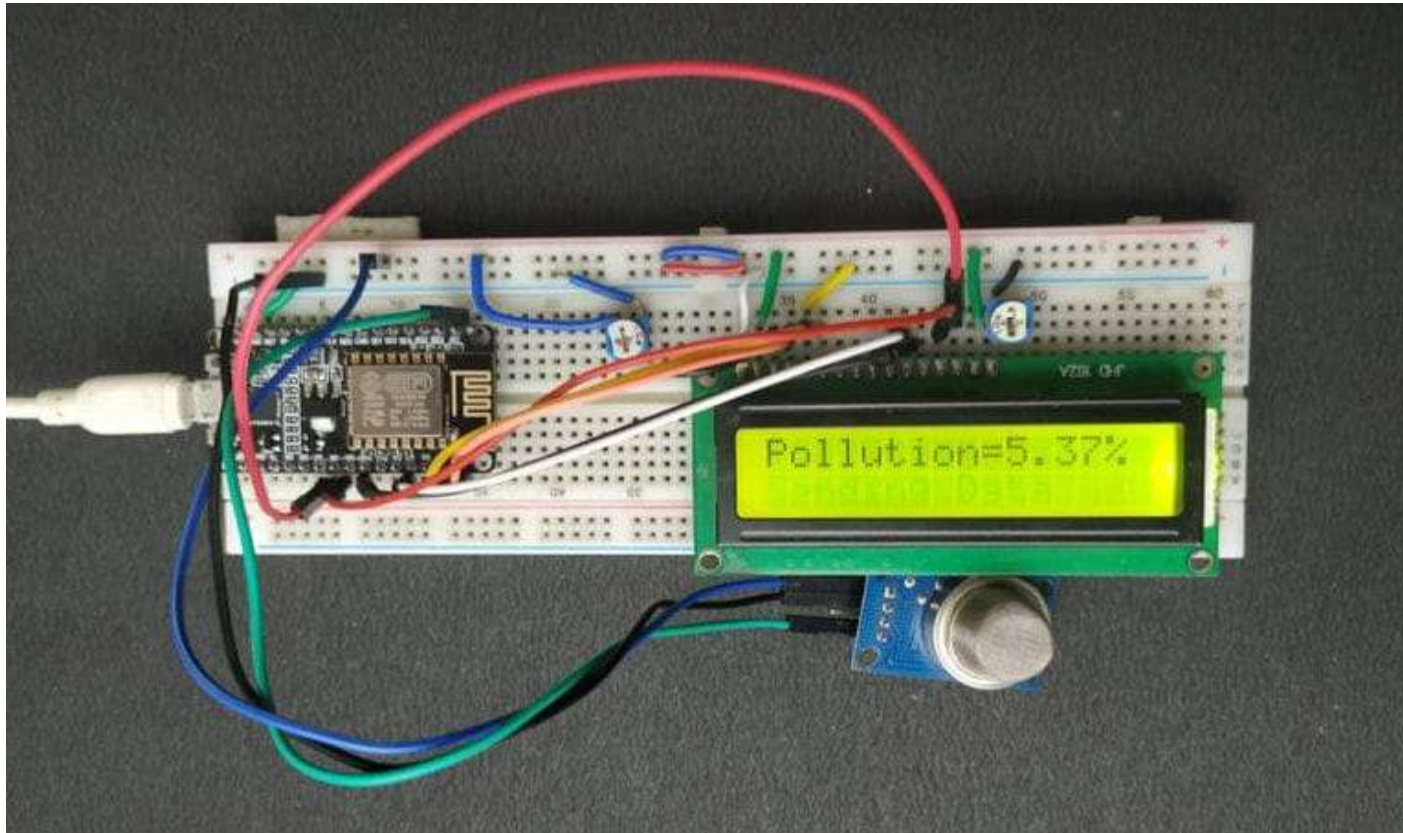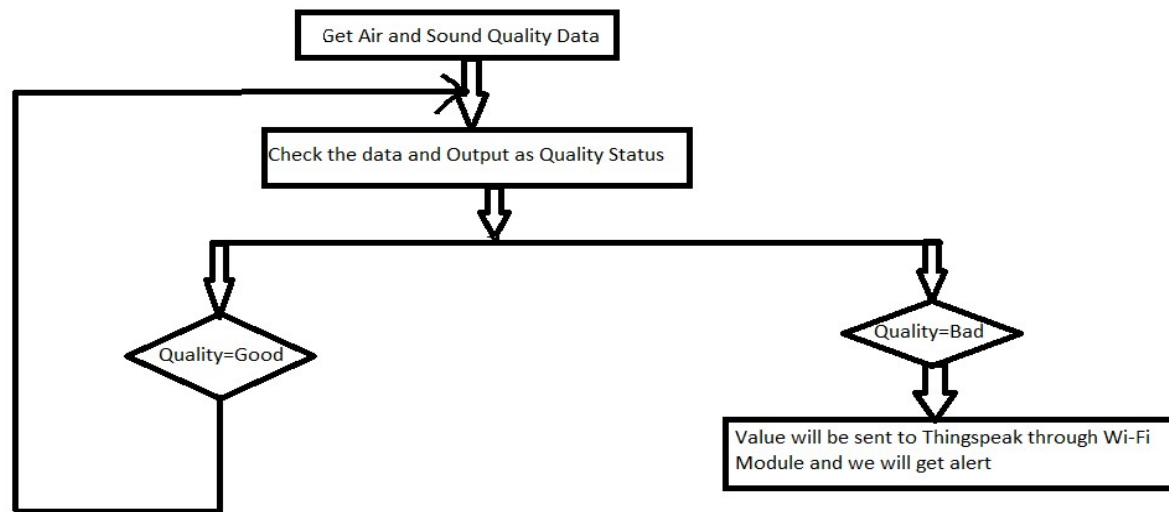► Thingspeak

► IFTTT

► Webhooks

# CIRCUIT DIAGRAM:-

# HARDWARE:-

# FLOW DIAGRAM:-

Get Air and Sound Quality Data

Check the data and Output as Quality Status

Quality=Good

Quality=Bad

Value will be sent to Thingspeak through Wi-Fi Module and we will get alert

# METHODOLOGY

▶ Here we are proposing an IOT based system to monitor air and sound quality. The system works on Arduino Uno which is based on Atmega 328 Microcontroller.

▶ We will connect an air sensor (MQ135) to sense the harmful gas in the air and sound sensor (LM393) to sense the sound level.

▶ We will connect LCD to display the level of air and water pollution as well as we will connect a buzzer and LED to alert if the level of pollution exceeds the threshold value.

▶ The data obtained from the sensors will now be provided to the Wi-Fi Modem which will provide this data to the cloud and accordingly actions will be taken.

▶ We will get a graphical representation to show the sound and air pollution level using Thingspeak.

▶ To generate automatic notification, we will be using the cloud IFTTT and will utilize Webhooks service.

# COMPARISON

In contrast to other online air and sound quality monitoring system, we have introduced some additional facilities:

▶ We have introduced automatic notifying facility which will enable the person to know if the level of air and sound increases the threshold value, even if he is not logged in the cloud, in form of message or mail.

▶ We have also introduced MQ7 sensor, a carbon monoxide sensor, which will detect the presence of carbon monoxide in the air and if the level is high then we can infer that some open fires that use gas, wood, oil and coal or poor ventilation system or any technical faults like fault in water heater, cooker, etc has increased the CO level in air and needs attention.

▶ We will also introduce solar panel to charge the battery which will be used to power up the Arduino thereby not requiring any electricity and using renewable source of energy to power up.

# RESULT AND DISCUSSION

▶ Sensors senses the air and noise pollution level and will give the result in ppm(parts per million) and notify us through mobile notification.

▶ The Carbon Monoxide level in air and the Noise level is measured successfully.

▶ Measured value is displayed in LCD and if a sudden increment is noticed then we can take immediate action without delay.

▶ A sound is made by the buzzer and LED blinks if the value exceeds the threshold value.

▶ We obtained graphical representation of the pollution level in each case.

▶ We also received automatic notification in our mobile phone.

▶ Solar panel charges the battery which helps the Arduino to function.

▶ No wastage of electricity and user can access the pollution level of the area by using GPS.

# OUTCOME AND CONCLUSION

▶ The IOT based system to predict air and noise pollution is a great step towards a healthy livelihood.

▶ This device will not only be helpful for the municipal authorities, but common people will also be able to participate in controlling pollution.

▶ Since we are using renewable energy sources throughout the system, so less wastage of electricity and batteries.

▶ This system can record all the data and will help the people and authorities to track the pollution level and take necessary steps.

▶ The output data is also notified through mobile phones and in cloud platform which helps to track pollution level from anywhere.

▶ This system is based on latest technology and hence it is inexpensive and can be installed at any place.

▶ Hence, we can conclude that this system is eco-friendly, reliable and completely protects the environment.

# REFERENCES

▶ https://www.researchgate.net/publication/350823548_IoT-based_air_quality_monitoring_systems_for_smart_cities_A_systematic_mapping_study

▶ https://iopscience.iop.org/article/10.1088/1757-899X/955/1/012005/pdf

▶ https://www.researchgate.net/publication/321260260_Air_and_noise_pollution_monitoring_in_the_city_of_Zagreb_by_using_mobile_crowdsensing

▶ https://www.ijert.org/iot-based-air-and-sound-pollution-monitoring-system?amp=1

▶ http://ijics.com/gallery/37-april-537.pdf

▶ https://www.researchgate.net/publication/352664227_Development_of_Real-time_IoT_based_Air_and_Noise_Monitoring_System