

# Air Quality Monitoring System

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# INTRODUCTION

- ❖ Pollution
- ❖ Traffic
- ❖ Industries
- ❖ Increase in vehicles
- ❖ Lack of Data
- ❖ Health Problems



# LITERATURE SURVEY



Air Quality Monitoring system at National Lab



Indoor air quality checking devices in US



# Aim and Objectives

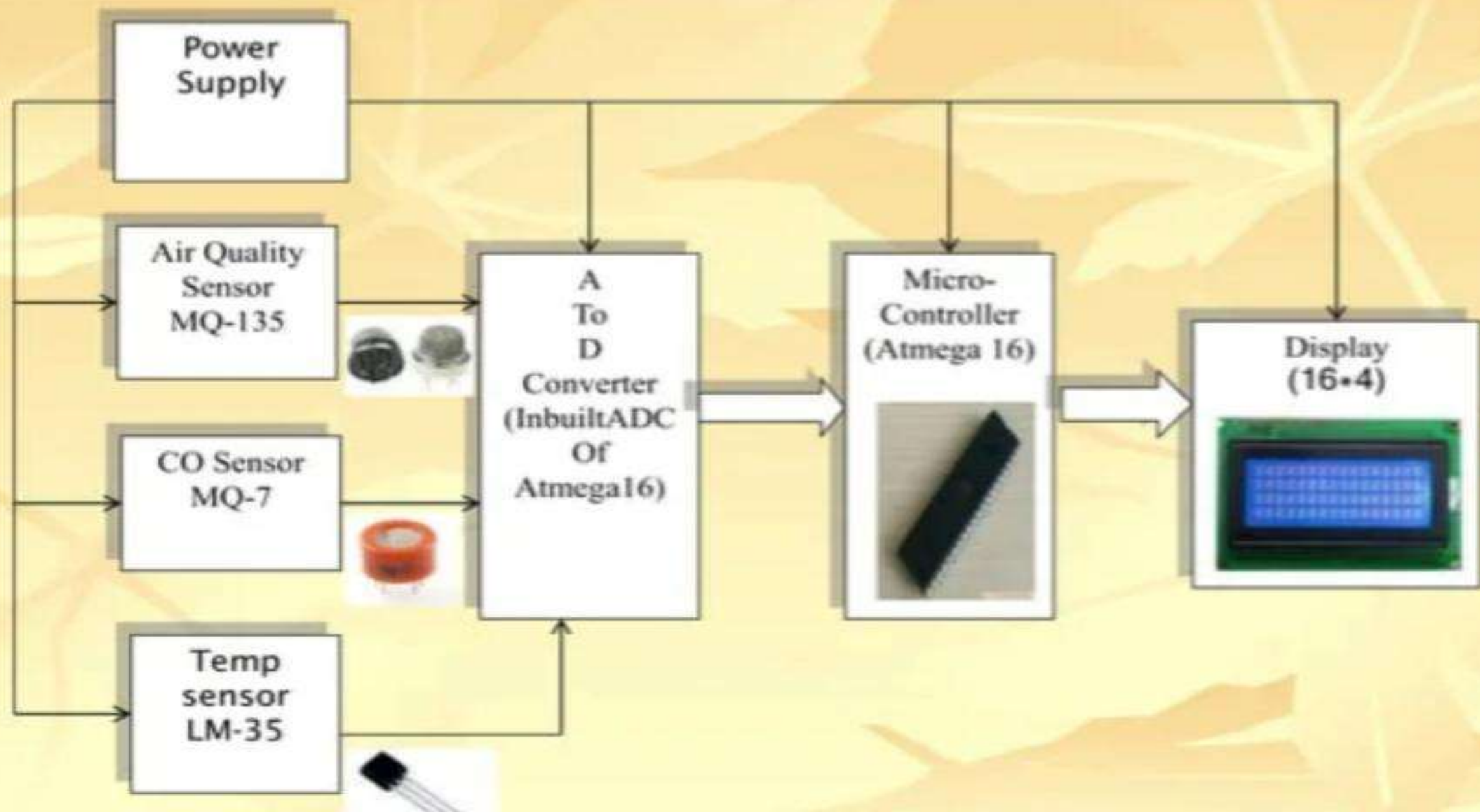
- ❖ To create a tool which will monitor the quality of air of our environment.
- ❖ Content of different gases present in air or area around us.
- ❖ Display the data on LCD.

# PROBLEM STATEMENT

Design a tool which will-

- 1) Sense quality of air and display it in the form of percentage.
- 2) Sense how much Carbon Mono-oxide(CO) is present in air and display in the form of percentage.
- 3) Sense the temperature and display it in degree celcius

# PROPOSED BLOCK DIAGRAM





# PRINCIPLE OF WORKING

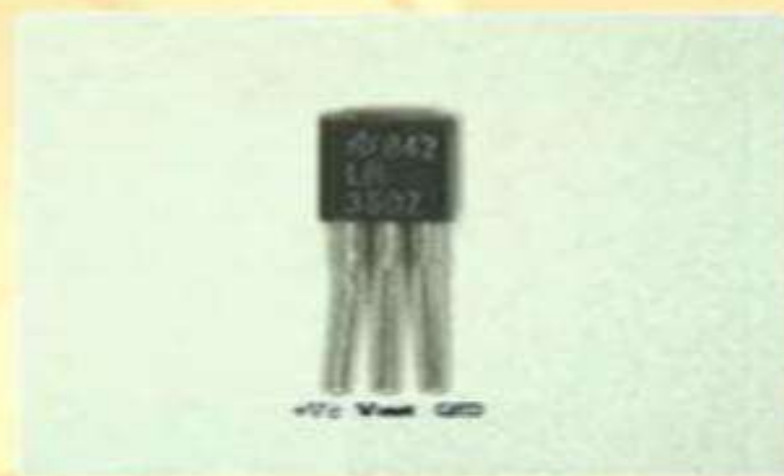
- ❖ Project's basic principle of working is the sensing of data from the sensor .
- ❖ Convert the analog ( voltage ) data into digital form.
- ❖ Process the digital data and display it on LCD.



MQ 135



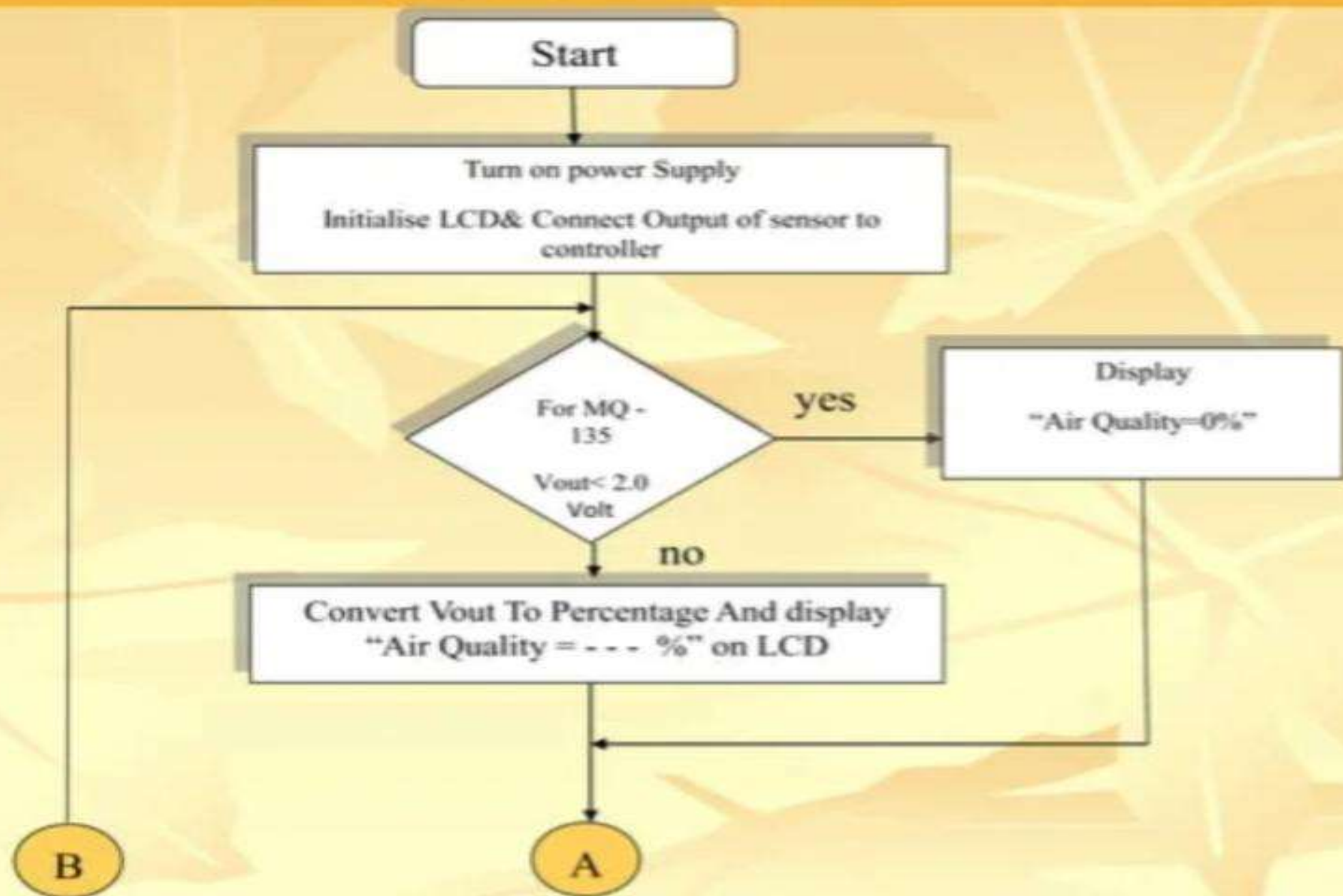
MQ 7

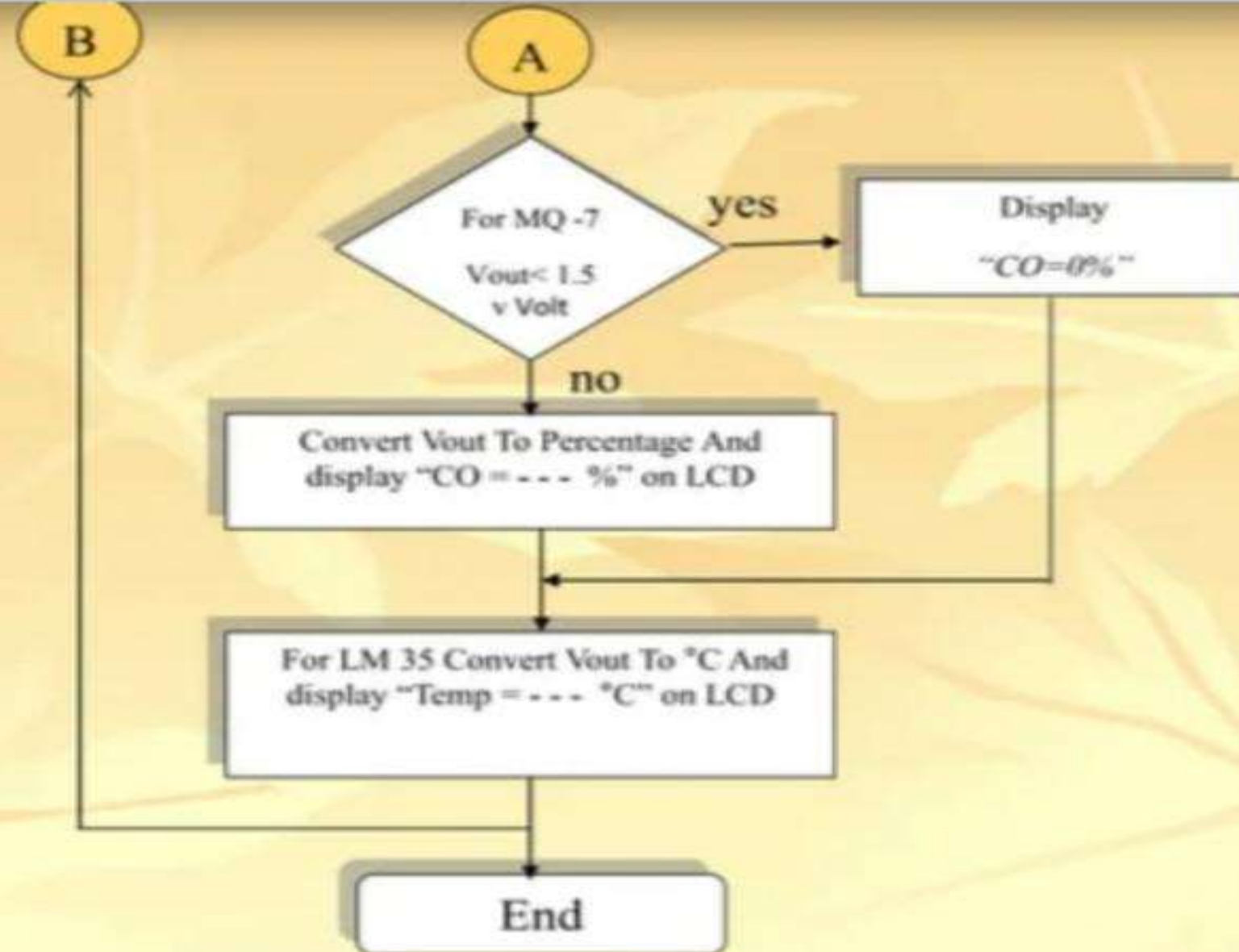


LM 35



# FLOW CHART





# RESULTS

## MQ 135

Output Voltage	Air Quality (%)
1.58	0
1.65	0
1.68	0
1.73	0
1.79	0
1.92	0
1.96	0
2.00	0
2.05	1.66
2.36	12
2.79	26.33
3.06	35.33
3.14	48
3.56	52
3.84	61.56
3.96	65.33
4.10	70
4.26	75.33
4.38	79.33

In Case of Sensor MQ-135 If  $V_{out} < 2$  V then 0 % Pollution is present i.e. < 10 ppm then air is of good quality

As a Pollution increase then voltage is increase 1 % to 55 % is air having pollution between 10 ppm to 16 ppm

If Air Quality is > 55 % then More amount of pollution present in air. Not good for human health



## MQ 7

Output Voltage	Air Quality( %)
0.78	0
0.85	0
0.96	0
1.05	0
1.17	0
1.43	0
1.65	4.28
1.75	7.142
1.86	10.28
1.99	13.61
2.16	18.85
2.35	24.28
2.55	30
2.76	36
2.91	40.28
3.09	45.42
3.42	54.85
3.56	58.85
4.12	74.85

In Case of Sensor MQ-7

If  $V_{out} < 1.5$  V then 0 % CO is present i.e. < 8 ppm then air is of good air

As a CO increase then voltage is increase 1 % to 36 % is air having pollution between 8 ppm to 25 ppm

If CO is > 36 % then More amount of pollution present in air. Not good for human health

# ADVANTAGES

- ❖ Sensors are easily available .
- ❖ Detecting a wide range of gases, including  $\text{NH}_3$ ,  $\text{NO}_x$ , alcohol, benzene, smoke and  $\text{CO}_2$ ,  $\text{CO}$  etc
- ❖ Simple, compact & Easy to handle .
- ❖ Sensors have long life time & less cost.
- ❖ Simple Drive circuit.
- ❖ System is Real time.
- ❖ Operating voltage : 5 volt,  $-20^\circ\text{C}$  to  $+50^\circ\text{C}$
- ❖ Quality of air can be checked indoor as well as outdoor.
- ❖ Visual output.
- ❖ Continuous update of change in percentage of quality.



# LIMITATIONS

- ❖ Only 3 sensors are used.
- ❖ Humidity should be less than 95%.
- ❖ Accurate measure of contaminating gases cannot be detected in ppm.



# APPLICATIONS

- ❖ Roadside pollution Monitoring .
- ❖ Industrial Perimeter Monitoring.
- ❖ Site selection for reference monitoring stations.
- ❖ Indoor Air Quality Monitoring.
- ❖ To make this data available to the common man.



# FUTURE SCOPE

In future the project can be upgraded in more ways than one.

- ❖ Interface more number of sensors to know detail content of all gases present in air.
- ❖ Design Webpage and upload data on webpage with date and time.
- ❖ Interface SD Card to store data.
- ❖ Interface GPS module to monitor the pollution at exact location and upload on the webpage for the netizens.

