# Pollution

By Gokul Krishna Krishnan

## Introduction

Pollution is an nothing but when these pollutants that is when an unnatural substance contaminates the natural environment. There are different forms of pollution the Air pollution water pollution noise pollution and there are many more. In this Project we are focusing only on the air pollution. Each Pollution have various effect on the living organisms and the environment such as environmental degradation, global warming, ozone depletion, climate change and these are lot of others but these are some of the major effects.

## Air Pollution

Air pollution is one of the major pollutant that has huge impact on the environment and also on the human health. Some of the major air Pollutants are carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate. Whenever these pollutants are introduced in the atmosphere there are huge impact on the environment the sources of the pollutants are from two types man made is major source such as smokes that are emitted form the factories vehicle pollution and other toxic waste that are poured in the land generates methane which results in ozone depletion.The air pollution is high in hugely populated areas as the man made air pollution is the major cause.

## Air Quality Index

The air quality index is a way to calculate the air pollution level. In order to calculate the Air Quality Index we need to measure the level of five major pollutants in the atmosphere carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate and ozone index level. The value of the air quality index ranges from to grater than 100 and it is split in to 5 categories 0 to 25 is considered as very low pollution, 25 to 50 is considered as low pollution , 50 to 75 is considered as medium pollution, 75 to 10 is high and values above 100 is very high said to high air pollution and it is extremely hazardous to health. These categories are color coded to communicate in a easy way to the people very low as green, low as light green, Medium as yellow, high as orange and very high as red.

## Carbon monoxide

Carbon monoxide is denoted as CO in chemical formula is naturally present in the atmosphere in the small level The carbon monoxide is harmful to humans when inhaled in large amount . The CO is formed mainly by burning. The major effects to human health when exposed to CO are Heart disease as in reduces the oxygen level that are supplied to the heart. IF the humans are exposed to CO in a long term then it cause also result in death too.

## Nitrogen dioxide

Nitrogen Dioxide id denoted as No2 in the chemical formula is also mainly caused by vehicular pollution due to the combustion of fossil fuels. The exposure of No2 to humans has some major health hazards such respiratory failure, irritation to the eyes and also it is extremely hazardous to the people already have respiratory failures

## Sulfur dioxide

Sulfur Dioxide id denoted as SO in the chemical formula is also mainly caused by industrial sources such as in the process of electricity generation. The exposure of SO to humans cause difficulty in breathing as it forms as a small particles in the air and the log term exposure can cause some serious lung disease.

## Particulate Matter

Particulate matter are the mixture of solid particle and liquid droplets found in the atmosphere the it is also denoted as pollution matter(PM). Some examples are dust, smoke which are found in the air. When inhaled by humans they can be hazards as they can deep in to the lungs and also the blood stream which cause major health problems.

## Ozone

Ozone can be found in the upper atmosphere of the earth as it forms a protective layer to protect the humans from the harmful radiations such as ultraviolet rays from the sun but the ozone that is found in the sea level are not caused by the environment it formed due to the pollution from both transportation and industrial pollutants. Exposure to ozone can lead to some major health issues to the human it can lead to asthma, bronchitis Etc.

## About Data

In this Project dataset has the values for carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter and ozone index levels.The measurements of these Pollutants are collected from August 2014 to October 2014 there are 2245 sensors placed in the exact same location of the traffic sensors.The values updated for every 5 minutes. The reading from each of sensors the values ranges from 25 to 100 and these values are normalized, if the value was are below 20 then random number between 1 and 10 is added to the value, if the value was higher than 210, then a random number between 1 and 10 is added, else the value will be added a value of random integer between negative 5 and positive 5. The values are normalized in order to remove the skewness in the data.