# Problem Statement

Given a set of users who want to contribute towards task published by a crowd sensing platform, use quality of data to enhance the data collection process while minimizing the cost to platform.

# Data Set Used

This data set contains the air quality of Madrid city neighborhoods. If contains 18 years (2001 - 20018) of hourly data, captured by different stations in Madrid city neighborhood.

The complete list of possible measurements and their explanations are:

* SO\_2: sulphur dioxide level measured in μg/m³. High levels of sulphur dioxide can produce irritation in the skin and membranes, and worsen asthma or heart diseases in sensitive groups.
* CO: carbon monoxide level measured in mg/m³. Carbon monoxide poisoning involves headaches, dizziness and confusion in short exposures and can result in loss of consciousness, arrhythmias, seizures or even death in the long term.
* NO: nitric oxide level measured in μg/m³. This is a highly corrosive gas generated among others by motor vehicles and fuel burning processes.
* NO\_2: nitrogen dioxide level measured in μg/m³. Long-term exposure is a cause of chronic lung diseases, and are harmful for the vegetation.
* PM25: particles smaller than 2.5 μm level measured in μg/m³. The size of these particles allow them to penetrate into the gas exchange regions of the lungs (alveolus) and even enter the arteries. Long-term exposure is proven to be related to low birth weight and high blood pressure in newborn babies.
* PM10: particles smaller than 10 μm. Even though the cannot penetrate the alveolus, they can still penetrate through the lungs and affect other organs. Long term exposure can result in lung cancer and cardiovascular complications.
* NOx: nitrous oxides level measured in μg/m³. Affect the human respiratory system worsening asthma or other diseases, and are responsible of the yellowish-brown color of photochemical smog.
* O\_3: ozone level measured in μg/m³. High levels can produce asthma, bronchytis or other chronic pulmonary diseases in sensitive groups or outdoor workers.
* TOL: toluene (methylbenzene) level measured in μg/m³. Long-term exposure to this substance (present in tobacco smkoke as well) can result in kidney complications or permanent brain damage.
* BEN: benzene level measured in μg/m³. Benzene is a eye and skin irritant, and long exposures may result in several types of cancer, leukaemia and anaemias. Benzene is considered a group 1 carcinogenic to humans by the IARC.
* EBE: ethylbenzene level measured in μg/m³. Long term exposure can cause hearing or kidney problems and the IARC has concluded that long-term exposure can produce cancer.
* MXY: *m*-xylene level measured in μg/m³. Xylenes can affect not only air but also water and soil, and a long exposure to high levels of xylenes can result in diseases affecting the liver, kidney and nervous system (especially memory and affected stimulus reaction).
* PXY: *p*-xylene level measured in μg/m³. See MXY for xylene exposure effects on health.
* OXY: *o*-xylene level measured in μg/m³. See MXY for xylene exposure effects on health.
* TCH: total hydrocarbons level measured in mg/m³. This group of substances can be responsible of different blood, immune system, liver, spleen, kidneys or lung diseases.
* CH4: methane level measured in mg/m³. This gas is an asphyxiant, which displaces the oxygen animals need to breath. Displaced oxygen can result in dizzinnes, weakness, nausea and loss of coordination.
* NMHC: non-methane hydrocarbons (volatile organic compounds) level measured in mg/m³. Long exposure to some of these substances can result in damage to the liver, kidney, and central nervous system. Some of them are suspected to cause cancer in humans.

# Simulation