Project title: **Air Quality Monitoring-using IOT**

Phase 1**: Project Definition and Design Thinking**

**Project Definition:**

The project aims in monitoring the quality of air, by monitoring various quality factors of air in various regions using various IOT devices and providing those monitored details in a platform using cloud that makes the public aware about the quality of the air in the specified region ,the core aim of the project is to update the public the real time air quality of the region.

**Project Objectives**:

* The primary aim is used to develop a product which integrates various sensors to monitor the quality of air and update the quality tpo the public.
* Monitoring the amount of pollutant gases in the air which includes(Carbon-Di-oxide(CO2 ) , Carbon Monoxide (CO), Oxides of Nitrogen (NO2 and NO3), Ozone (O3), Lead (Pb), and other volatile organic compound ).
* Monitoring the particulate pollutant contents in air.
* Updating the public with Parameters such as temperature, humidity, wind speed, wind direction, and atmospheric pressure are essential for understanding how pollutants disperse and react in the atmosphere.
* Updating the information of the monitored data through cloud platforms to the public in real time manner.
* Comparing the air quality of the region over a certain period of time through the obtained data and providing a picture of overall air quality of the region to the public.

**IoT Devices Designs**:

* To deploy sensors such as ppm sensors, gas sensors, volatile organic compound sensors, metrological sensors over a particular area.
* To use a microcontroller or microprocessor which act as the interface between the sensors and the cloud.
* To develop a communication module (e.g., Wi-Fi, cellular, LoRa, or NB-IoT) to transmit collected data to a central server or cloud platform.
* Implement data storage and processing capabilities on the device itself or in the cloud. You can use a micro SD card, onboard memory, or cloud-based databases for data storage.
* Set up a data transmission protocol (e.g., HTTP, MQTT) to send data to a central server or cloud platform. Create a user-friendly web or mobile application for data visualization and alerts.

**Data Sharing Platform:**

* Establishing a user interface to make the user aware about the various collected data of air quality
* Establishing a regularized history of the data collected using software (Developed using PYTHON) at the interface.
* The data collected and maintained by the cloud can be shared to compare the quality of air in certain regions using software

**Integration Approach:**

* Decide on communication protocols and technologies for data transmission from sensors to the central platform.
* Develop data analytics and decision-making algorithms for monitoring, maintaining and sharing the obtained quality of data.
* Plan for redundancy and failover mechanisms to ensure reliability