**Living Quality** **Project Documentation**

Project Idea:

The objective of this project is to address the disparity in living conditions between urban and suburban areas by developing a comprehensive framework called "Living Quality". The framework incorporates various environmental sensors, including humidity, light, air, and sound sensors, strategically placed in different parts of a city. By comparing the collected sensor data with corresponding metrics outside the city, the Living Quality framework aims to provide valuable insights into the overall quality of living in urban areas. To achieve this, the project employs a cloud service, specifically Firebase, to store and process the gathered data. Additionally, a live model is developed to analyze the score of of these metrics with the current readings, allowing the framework to determine whether the quality of living has improved or not.

Main Features:

Sensor Integration: The Living Quality framework integrates multiple sensors, including humidity, light, air, and sound sensors, which are strategically placed in various locations within the city. This allows for the comprehensive measurement of environmental conditions.

Comparison Analysis: The collected sensor data from the urban areas is compared with metrics recorded outside the city. This analysis enables a comprehensive evaluation of the living conditions and facilitates the identification of areas that require improvement.

Cloud Service: Firebase is utilized as the cloud service platform to store, process, and retrieve sensor data. By leveraging the capabilities of Firebase, the Living Quality framework can efficiently handle large volumes of data and ensure real-time access to the information.

Mobile Application: A dedicated mobile application is developed using Android Studio, to present the sensor readings and living quality analysis to users in an intuitive and user-friendly manner. The application allows users to access real-time sensor data and view historical trends.

Architecture:

The Living Quality measurement framework follows a distributed architecture, comprising several interconnected subsystems. These subsystems include IoT nodes with sensors, a cloud service, an AI model, and a mobile application.

IoT Nodes:

Raspberry Pi: The Raspberry Pi serves as the IoT node, connecting to the humidity, light, air, and sound sensors placed in different areas of the city.

Sensors: The sensors capture and measure the respective environmental metrics, providing crucial data for the Living Quality framework.

Cloud Service:

Firebase: The Firebase platform is employed as the cloud service, offering scalable data storage, efficient data processing, and real-time communication capabilities.

Data Storage: Firebase stores the collected sensor readings and historical data, ensuring data integrity and accessibility.

Data Processing: The cloud service processes and performs necessary computations on the collected data, enabling efficient analysis and prediction.

API: An API facilitates seamless communication and data exchange between the IoT nodes, AI model, and the mobile application.

AI Model:

Machine Learning: The Living Quality framework utilizes machine learning techniques to train an AI model. The model leverages historical data and sensor readings to predict living quality improvements and perform comparative analysis.

Prediction Analysis: The AI model compares the current sensor readings with historical data to assess the degree of improvement in living conditions.

Mobile Application:

User Interface: The dedicated mobile application provides a graphical user interface that allows users to access and visualize the sensor readings, living quality analysis, and other relevant information. The interface is designed to be intuitive and user-friendly, providing an enhanced user experience.

Real-time Updates: The mobile application enables users to monitor changes in living conditions in real-time. Users can view historical trends and receive notifications regarding living quality improvements