FINAL PROJECT

REPORT



Subject: WEB APPLICATION PROGRAMMING

Department: Industrial Engineering

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7. **Introduction**

This project aimed to develop an air pollutant dashboard and data analysis system. The primary objective was to provide real-time information on pollutant levels based on the user's location and offer insights into country-specific air quality. Additionally, the project included various visualization analyses based on 2020 air pollutant data from South Korea, focusing on identifying relationships between different pollutants.

1. **Tools and Technologies**

* Software and Libraries

• **Chart.js**: Used for creating interactive and dynamic visualizations for air quality data.

• **PapaParse**: To parse and process CSV data files for easy integration into the dashboard.

* APIs and Data Sources  
  **APIs:** OpenWeatherMap for live air quality data.

**2020 Air Pollutant Emissions Statistics**: Data sourced from the *National Fine Dust Information Center* in South Korea. This dataset includes emissions statistics by administrative district (city, county, district), emission sources, and fuel types.

1. **Methodology**

* Data Collection and Preprocessing

The dataset was obtained from the *National Fine Dust Information Center*. The dataset's columns were reviewed and organized to ensure relevance for the project's objectives.

- Original data  
텍스트, 스크린샷, 번호, 폰트이(가) 표시된 사진

자동 생성된 설명

- Modified data

텍스트, 스크린샷, 번호, 폰트이(가) 표시된 사진

자동 생성된 설명

The following columns were used for analysis:

• City/Province (시도)

• County/District (시군구)

• Emission Source (Large Category) (배출원대분류)

• Emission Source (Medium Category) (배출원중분류)

• Emission Source (Small Category) (배출원소분류)

• Fuel (Large Category) (연료대분류)

• Fuel (Small Category) (연료소분류)

• Pollutants: CO, NOx, SOx, TSP, PM-10, PM-2.5, VOC, NH3, BC

* Exploratory Data Analysis (EDA)

Various visualization techniques were applied to uncover patterns and relationships between pollutants. Examples of visualizations include:

• **Bar Chart:** Displays the distribution of air pollution by region.

• **Scatter Plot:** Illustrates the correlation between CO and PM2.5.

• **Distribution Graph:** Shows the total pollutant distribution.

* Model Development

The visualization framework was implemented using Chart.js to create interactive graphs. For instance:

텍스트, 스크린샷이(가) 표시된 사진

자동 생성된 설명

1. **Results**
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