# **Data Science Project Compilation**

This compilation of projects is designed to enhance skills in data analysis, data preparation, and data visualization using Python's popular libraries: NumPy, Pandas, Matplotlib, and Seaborn. Students are expected to complete three mini-projects, each focusing on different aspects of data science.

## **Project 1: Data Analysis with NumPy**

Objective: Utilize NumPy to perform statistical analysis on a dataset.

Task: Load a dataset (e.g., weather data or stock prices), and perform operations to calculate the mean, median, standard deviation, and correlation between columns.

Deliverable: A Jupyter Notebook that includes commentary on each step and visualizes the statistical information with NumPy operations.

## **Project 2: Cleaning and Preparing Data with Pandas**

Objective: Demonstrate data cleaning and preparation skills using Pandas.

Task: Take a raw dataset (such as from Kaggle or a public API) and perform cleaning operations like handling missing values, filtering, and data type conversions.

Deliverable: A Jupyter Notebook that walks through the data preparation process, with comments explaining the reasons behind each step.

## **Project 3: Comprehensive Data Visualization**

Objective: Showcase data visualization techniques using Matplotlib and Seaborn.

Task: Visualize a dataset by creating various graphs such as histograms, scatter plots, line charts, and heatmaps, each highlighting a different aspect of the data.

Deliverable: A Jupyter Notebook with a gallery of plots, each accompanied by a description of what insights the plot provides about the data.

## **Displaying Your Projects**

After completing the mini-projects, you will showcase your work using platforms like Binder or NBViewer. Research both platforms to understand how to share your projects dynamically. Binder allows you to provide a link where others can run your notebooks interactively, while NBViewer offers a static view of your notebooks. You are encouraged to explore both options and choose the one best suited for your project’s needs. Assistance will be provided to help set up your projects on your platform of choice.