

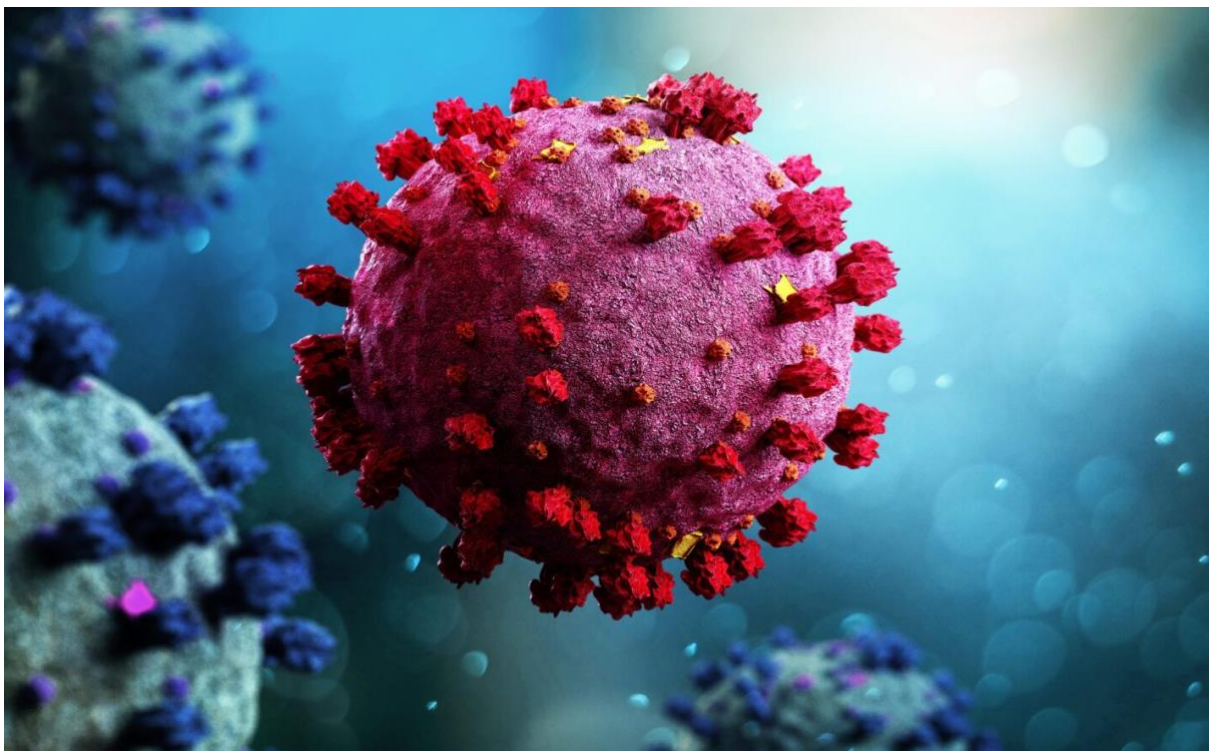
# **COVID-19 VACCINE ANALYSIS**

## **PHASE 4 SUBMISSION DOCUMENTS**

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# COVID-19 VACCINE ANALYSIS

## Introduction:

In this part you will continue Building the project

It continues conducting the covid-19 vaccine analysis by :

- Performing exploratory data analysis
- Statistical analysis
- Visualization



# PERFORMING EXPLORATORY DATA ANALYSIS:

Exploratory Data Analysis (EDA) for COVID-19 vaccines involves analyzing and visualizing data to gain insights and understand the distribution, patterns, and trends. Here are some steps you can follow:

**1. Data Collection:** Gather data related to COVID-19 vaccines. This could include vaccine distribution, administration, adverse events, and effectiveness data.

**2. Data Cleaning:** Check for missing values, duplicate records, and inconsistencies in the data. Clean the data to ensure it's ready for analysis.

### **3. Data Visualization:**

- Create visualizations like bar charts to show the distribution of vaccines by type and region.
- Use line charts to track the vaccination progress over time.
- Heatmaps can help identify areas with higher vaccination rates.
- Pie charts can illustrate the share of vaccine manufacturers.

### **4. Descriptive Statistics:**

- Calculate summary statistics (mean, median, standard deviation) for relevant variables.
- Perform statistical tests to compare vaccination rates between different regions or groups.

## **Program:**

```
# Import necessary libraries
import pandas as pd
import matplotlib.pyplot as plt

# Load COVID-19 data
data = pd.read_csv("covid19_data.csv")

# Basic EDA
print(data.head()) # Display the first few rows
of the dataset
print(data.info()) # Display information about
the dataset
```

## **STATISTICAL ANALYSIS:**

Statistical analysis for COVID-19 vaccines involves using statistical methods to draw conclusions from data related to vaccine effectiveness, safety, and distribution. Here are some key statistical analyses commonly performed in this context:

### **1. Vaccine Efficacy Analysis:**

- Calculate vaccine efficacy based on clinical trial data, comparing infection rates in the vaccinated and placebo groups.
- Use relative risk reduction, absolute risk reduction, and number needed to treat (NNT) metrics.
- Perform hypothesis tests to determine if observed differences are statistically significant.

## **2. Vaccine Safety Analysis:**

- Analyze adverse event data to assess the safety of vaccines.
- Calculate the incidence of adverse events and their confidence intervals.
- Use statistical tests to identify any significant associations between adverse events and vaccination.

## **3. Distribution Analysis:**

- Analyze vaccine distribution data to assess whether vaccines are being distributed equitably.
- Use descriptive statistics to summarize vaccine allocation and coverage across regions or demographic groups.
- Employ statistical tests to detect significant disparities in distribution.

## **VISUALIZATION:**

**Visualizations play a crucial role in conveying information about COVID-19 vaccines effectively. Here are some types of visualizations commonly used in the context of COVID-19 vaccines:**

**1. Vaccine Distribution Map:** Create a map showing how vaccines are distributed across regions or countries. Use different colors or shades to represent the number of doses administered in each area.

**2. Vaccination Progress Line Chart:** Plot the daily or weekly progress of vaccination, showing the cumulative number of doses administered over time. This helps track the speed of the time.



**3. Vaccine Type Pie Chart:** Use a pie chart to illustrate the distribution of different vaccine types or manufacturers in a particular region or globally.

#### **4. Bar Charts:**

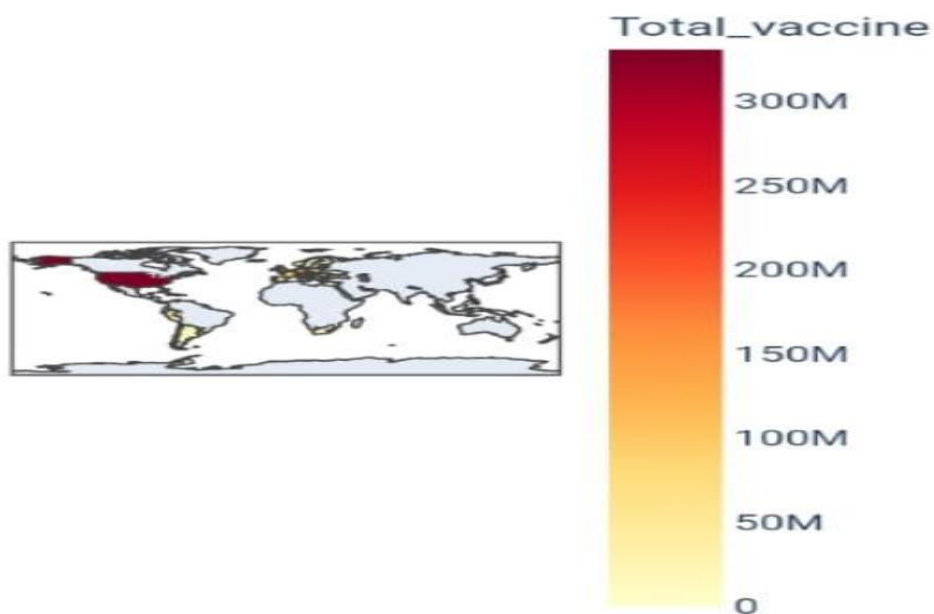
- Compare vaccination rates between different regions, age groups, or demographic categories using horizontal or vertical bar charts.
- Show the percentage of the population that has received one or both doses of the vaccine.

## Program:

```
fig = px.choropleth(data_frame=dtfrm,
                    locations=dtfrm.index,
                    locationmode='country names',
                    color='Total_vaccine',
                    color_continuous_scale='YlOrRd',
                    title='Ülkelerde Yapılan Biontech Aşıları')

fig.update_layout(title_x=0.5)
```

## Output:



## **Conclusion:**

- ❖ The following projects contains the performance of exploratory data analysis
- ❖ It also contains statistical analysis
- ❖ It conclude the project with the visualization of covid-19 vaccine analysis

**THANK YOU!**