Power BI Dashboard Assignment for Beginners to Intermediate Level

Assignment Overview:

The goal of this assignment is to create a Power BI dashboard that allows users to track COVID-19 cases and vaccination progress across different states and countries. The dataset contains information on confirmed cases, recoveries, deaths, vaccination totals, and other relevant statistics.

Data Sources Description:

1. **Raw COVID-19 Case Data** (`raw_data_Indian_states.csv`):
    - **Date**: The date of the data entry.
    - **State**: The state in India.
    - **Confirmed**: Total confirmed cases of COVID-19.
    - **Recovered**: Total recoveries from COVID-19.
    - **Deceased**: Total deaths due to COVID-19.
    - **Other**: Other factors like quarantined or under observation.
    - **Tested**: Total number of tests conducted.
2. **Vaccination Data** (`vaccination-data.csv`):
    - **Country**: The name of the country.
    - **ISO3**: Country code.
    - **WHO_REGION**: The WHO region the country belongs to (e.g., EMRO, EURO, AFRO).
    - **DATA_SOURCE**: The source of vaccination data (reporting or official).
    - **DATE_UPDATED**: The date the data was updated.
    - **TOTAL_VACCINATIONS**: Total number of vaccine doses administered.
    - **PERSONS_VACCINATED_1PLUS_DOSE**: Number of people vaccinated with at least one dose.
    - **TOTAL_VACCINATIONS_PER100**: Total vaccinations per 100 people.
    - **PERSONS_VACCINATED_1PLUS_DOSE_PER100**: Number of people with at least one dose per 100.
    - **PERSONS_FULLY_VACCINATED**: Total number of people fully vaccinated.
    - **PERSONS_FULLY_VACCINATED_PER100**: Number of people fully vaccinated per 100.
    - **VACCINES_USED**: List of vaccines used in the country.
    - **FIRST_VACCINE_DATE**: The date when vaccination started in the country.
    - **NUMBER_VACCINES_TYPES_USED**: Number of different vaccine types used.
3. **Case Time Series** (`case_time_series.csv`):
    - **Date**: Date of the data entry.
    - **Date_YMD**: The date in YMD format.
    - **Daily Confirmed**: Number of confirmed cases reported that day.
    - **Total Confirmed**: Cumulative total confirmed cases up to that date.

- **Daily Recovered**: Number of recoveries reported that day.
- **Total Recovered**: Cumulative total recoveries up to that date.
- **Daily Deceased**: Number of deaths reported that day.
- **Total Deceased**: Cumulative total deaths up to that date.

Task Description:

1. **Data Import and Transformation**:
   - Import all three datasets into Power BI.
   - Perform data cleaning where necessary (e.g., handling missing data, date format conversions).
   - Merge datasets based on common fields like **Date** or **State** for Indian data and **Country** for global vaccination data.
2. **Data Model**:
   - Create relationships between the datasets (e.g., link vaccination data with time-series case data using the **Date** field).
   - Ensure the model is optimized for analysis.
3. **Dashboard Creation**:
   - **KPIs** (Key Performance Indicators):
     - **Total Confirmed Cases**: Sum of confirmed cases.
     - **Total Recoveries**: Sum of recovered cases.
     - **Total Deaths**: Sum of deceased cases.
     - **Total Vaccinations Administered Globally**: Sum of vaccinations administered globally.
     - **Fully Vaccinated Population Percentage**: Percentage of fully vaccinated people globally and by country.
   - **Visualizations**:
     - **Line Chart**: Show the trend of confirmed, recovered, and deceased cases over time.
     - **Bar Chart**: Display confirmed cases and recoveries by state/country.
     - **Map Visualization**: Use a map to show vaccination progress and COVID-19 cases by country.
     - **Pie/Donut Chart**: Display the distribution of vaccine types used globally or within a country.
     - **Gauge/Target**: Show vaccination progress as a percentage of the total population (goal is to achieve 100% vaccination).
4. **Filters and Slicers**:
   - Create slicers for **Date**, **Country**, **State**, and **WHO Region** to allow dynamic filtering of the data.
   - Enable filters to view specific time periods (e.g., monthly or weekly trends).
5. **Interactions**:
   - Ensure that visuals interact with each other, allowing users to select a country, state, or time range and see how it affects all other data on the dashboard.

Expected Deliverables:

1. **Power BI Dashboard**:
    - The dashboard should include all KPIs and visualizations, clearly showing trends in COVID-19 cases and vaccination data.
    - The dashboard should be interactive and provide clear insights into the spread of COVID-19 and vaccination progress globally and within India.
2. **Report**:
    - A short explanation of the visualizations used.
    - Justifications for the chosen KPIs.
    - Insights derived from the data (e.g., trends, anomalies, etc.).

Evaluation Criteria:

- **Data Cleaning and Transformation**: Proper handling of missing data, date formats, and data merges.
- **Dashboard Design**: User-friendly layout, clear visualization of KPIs, and effective use of filters and slicers.
- **Insights and Analysis**: Ability to generate meaningful insights from the data.
- **Use of Power BI Features**: Effective use of various Power BI functionalities such as relationships, calculated columns, measures, and visual interactions.

Suggested Timeline(20 Days):

- **Data Import and Cleaning**: 2 days
- **Data Modeling**: 3 day
- **Dashboard Design and Visualization**: 11 days
- **Report Writing**: 4 day

Target Skills:

- Data Import and Data Cleaning in Power BI
- Data Modeling and Relationships
- Visualizations: Line charts, Bar charts, Maps, Pie charts, Gauge charts
- KPIs and Calculations
- Filters and Slicers
- Interactive Dashboard Design