Professional Program on Data Analyst

Exercise: Visualizing Global Earthquake Data with Correct Geographic Representation

In this exercise, we will use the USGS Earthquake Catalog dataset, containing information about earthquakes with a magnitude greater than 4.5, during 2024.

Prerequisites:

- Install Tableau Public.
- Download the USGS Earthquake Catalog dataset in CSV format.

Step-by-Step Instructions

Step 1: Download the Dataset

1. **Download the Dataset:**
   - Visit the USGS Earthquake Catalog website.
   - Filter the data to include earthquakes with a magnitude greater than 4.5 for the year 2024.
   - Export the data in CSV format and save it to your computer.

Step 2: Load the Dataset into Tableau Public

1. **Open Tableau Public:**
   - Launch Tableau Public on your computer.
2. **Load the Dataset:**
   - Click on "Text File" under the "Connect" pane on the left side of Tableau Public.
   - Navigate to the location where you saved the CSV file from the USGS Earthquake Catalog and select it.
   - Tableau will load the dataset and display a preview.

Step 3: Create Visualisations

1. **Ensure Correct Interpretation of Geographic Data:**
   - Make sure that Tableau correctly interprets the `latitude` and `longitude` fields as geographic fields:
     - Click on the `latitude` field in the data pane and set it to "Geographic Role" -> "Latitude".
     - Click on the `longitude` field in the data pane and set it to "Geographic Role" -> "Longitude".
2. **Map of Earthquake Locations:**
   - **Create a new worksheet.**

- **Drag `longitude` to the Columns shelf.**
- **Drag `latitude` to the Rows shelf.**
- Tableau should automatically create a map with dots representing earthquake locations.
- **Drag `magnitude` to Size on the Marks card** to adjust the size of the dots based on earthquake magnitude.
- **Drag `depth` to Colour on the Marks card** to colour-code the dots based on earthquake depth.

3. **Map with Magnitude Filters:**
    - **Create a new worksheet.**
    - Repeat the steps to create the basic map of earthquake locations.
    - **Drag `magnitude` to the Filters shelf.**
    - **Set a filter to show only earthquakes with a magnitude greater than a certain value (e.g., 5.0).**
    - Adjust the size and colour of the dots as needed to make the map more informative.

4. **Map with Time Animation:**
    - **Create a new worksheet.**
    - Repeat the steps to create the basic map of earthquake locations.
    - **Drag `time` to the Pages shelf.**
    - This will create an animation that shows how earthquake locations change over time.
    - Use the play button to see the animation.

Step 4: Create a Dashboard

1. **Combine Visualisations:**
    - Click on the "New Dashboard" button at the bottom.
    - Drag and drop your sheets onto the dashboard.
    - Arrange and resize them as needed.
2. **Add Interactivity:**
    - You can add filters, legends, and other interactive elements to make your dashboard more user-friendly.

Detailed Instructions:

Step 1: Download the Dataset

- Visit the [USGS Earthquake Catalog](#).
- Use the search criteria to filter earthquakes with:
    - Magnitude: > 4.5
    - Date range: 01/01/2024 to 12/31/2024
- Click on "Search Earthquakes".
- Export the results to CSV format and save the file to your computer.

Step 2: Load the Dataset into Tableau Public

1. **Open Tableau Public:**
   - If you haven't installed Tableau Public yet, download and install it from [Tableau Public](#).
2. **Load the Dataset:**
   - Launch Tableau Public.
   - In the "Connect" pane on the left, select "Text File".
   - Locate the downloaded CSV file and open it.
   - Tableau will load the data and show a preview.

Step 3: Create Visualisations

1. **Ensure Correct Interpretation of Geographic Data:**
   - In the data pane, locate the `latitude` and `longitude` fields.
   - Right-click on `latitude` -> "Geographic Role" -> "Latitude".
   - Right-click on `longitude` -> "Geographic Role" -> "Longitude".
2. **Map of Earthquake Locations:**
   - Click on "Sheet 1" to create a new worksheet.
   - Drag `longitude` to the Columns shelf.
   - Drag `latitude` to the Rows shelf.
   - Tableau will create a map.
   - Drag `magnitude` to the Size on the Marks card to vary the dot size by earthquake magnitude.
   - Drag `depth` to Colour on the Marks card to colour-code the dots by earthquake depth.
3. **Map with Magnitude Filters:**
   - Create a new worksheet by clicking on the "New Worksheet" button.
   - Repeat the steps to create a basic map.
   - Drag `magnitude` to the Filters shelf.
   - Set the filter to show only earthquakes with a magnitude greater than 5.0.
   - Adjust the size and colour of the dots as needed.
4. **Map with Time Animation:**
   - Create a new worksheet.
   - Repeat the steps to create a basic map.
   - Drag `time` to the Pages shelf to create an animation of earthquake occurrences over time.
   - Use the play controls to animate the map.

Step 4: Create a Dashboard

1. **Combine Visualisations:**
   - Click on the "New Dashboard" button at the bottom.
   - Drag and drop your worksheets onto the dashboard.
   - Arrange and resize them as needed.
2. **Add Interactivity:**
   - Use filters, legends, and other interactive elements to make your dashboard more user-friendly.

    ○   Add interactive filters to allow users to filter the data by magnitude, depth, or time.

In this exercise, you learned how to:

1. **Data Loading:** How to load a CSV dataset into Tableau Public.
2. **Geographic Data Handling:** Correctly interpreting geographic fields in Tableau.
3. **Visualisation Creation:** Creating and customising maps in Tableau.
4. **Interactive Dashboards:** Combining visualisations into a dashboard with interactive elements.

Dataset for Practice: Download the sample dataset to practise these tasks and replicate the exercise.