**CSCE 5320 Scientific Data Visualization**

**Final Project Guidelines**

1. **Introduction**

* **Project Title**: The title should reflect the theme of your data analysis and the integration of interactive visualization tools.
* **Domain**: Briefly describe the subject area or problem you are tackling. This could include areas like business analytics, scientific research, economics, healthcare, social media trends, etc.

1. **Problem Statement**

* Clearly define the problem or question you aim to explore using the data.
* Explain why solving this problem or analyzing this question is important and how interactive data visualization can enhance understanding or decision-making in your domain.

1. **Methodology**

* **Workflow Diagram**: Create a detailed representation of the data flow from collection, processing, transformation, and visualization. This will show the key steps and tools used in your project.

1. **Data Abstraction**

* **Dataset Details**:
  + Type of Dataset: Describe whether the dataset is structured, semi-structured, or unstructured.
  + Attributes: List the key columns or features in the dataset.
  + Number of Records: Specify the size of the dataset (e.g., number of rows or entries).
  + Mention the attribute types, data types and dataset type for all types you use for data visualization
* **Data Source**:
  + Mention where the dataset was sourced from (e.g., Kaggle, UCI Machine Learning Repository, or any other open-source dataset).
* **Data Transformation** (if any):
  + Outline the steps taken to clean, filter, and preprocess the data.
  + Mention how missing values, outliers, or irrelevant data were handled.
* **Workflow Diagram** (Optional): Include a visual representation of how the data is processed before visualizations are created.

1. **Task Abstraction**

* **Target (What are you trying to find?)**:
  + Clearly define the key insights, trends, or patterns you aim to discover or visualize from the data.
* **Actions (What methods are used to find insights?)**:
  + Discuss the methods and techniques you used for analysis (e.g., data aggregation, filtering, correlation analysis, regression, clustering, etc.). Also, mention about searching, analyzing and querying.
* **Workflow Diagram** (Optional): Provide a step-by-step approach to define tasks and actions in your data exploration and visualization process.

1. **Implementation Using Tools**

* **Tools Used for Data Exploration and Visualization**:
  + Specify the tools or software you used (e.g., Tableau, Power BI, D3.js, Plotly, Altair, etc.).
* **Implementation Steps**:
  + Explain how you loaded the data into the tool.
  + Discuss the types of visualizations you created (e.g., bar charts, scatter plots, heatmaps, time-series visualizations).
  + Describe how these visualizations help in understanding and uncovering insights from the data.

1. **Results and Analysis**

* **Visualization Graphs with Explanations**:
  + Present at least 8-10 different visualizations that highlight key patterns or trends in the data.
  + Provide clear explanations for what each visualization reveals about the dataset and its implications.
* **Storytelling Approach**:
  + **Stage 1: Understanding and Exploring the Dataset**:
    - What does the raw data look like?
    - Which key variables or trends stood out during your exploration?
  + **Stage 2: Correlation Analysis and Data Transformation**:
    - What relationships exist between variables?
    - Are there any significant patterns between different factors? How does data transformation help uncover these?

1. **Work Management**

* **Implementation Status Report**:
  + Summarize the work.
  + Include a breakdown of responsibility (who worked on which aspects).
  + List contributions by team members and their respective percentages of work.

1. **Areas to Focus**

* **Visualization**:
  + Integrate additional datasets for deeper insights and broader analysis.
  + Consider using interactive visualizations (e.g., D3.js, Plotly, Altair) for a more engaging user experience.
  + Refine your methodology to uncover more complex relationships within the data.
* **Webpage Integration**:
  + Create an interactive webpage to present your visualizations using HTML, CSS, and JavaScript.
  + Publish your Tableau or Power BI dashboard and embed it on the webpage using the provided embed code.
* **Transitioning from Static to Interactive Storytelling**:
  + Make your visualizations more interactive, allowing users to explore different views and insights dynamically.

1. **Submission Guidelines**
2. **Source Code and Dashboard**:
   * Submit the source code files and dashboards (e.g., Tableau or Power BI, Python, D3.JS) on Canvas as per the requirements.
3. **PowerPoint Presentation**:
   * Submit a PowerPoint presentation summarizing your project, including the methodology, key results, and visualizations. If you have created an interactive webpage, include a link to the webpage in the presentation.
4. **Additional Files**:
   * Upload all miscellaneous files, such as images, results, and screenshots of visualizations, in a zip folder.