**Visualization Project Part 2: Sketching your Data**

**Task 1: Analyze Correlation between Weather Variables and Summit Success**

* **Goal:** Understand how different weather variables correlate with summit success to identify key factors influencing climbing outcomes.
* **Means:** Conduct statistical analysis (e.g., correlation coefficients, regression analysis) to quantify the relationship between weather variables (temperature, humidity, wind speed, solar radiation) and summit success.
* **Characteristics:** This task seeks to learn about the strength and direction of the relationships between weather conditions and summit success rates.
* **Target Data:** Historical weather data and climbing records.
* **Workflow:** This task is typically performed during the data exploration phase to gain insights into potential patterns or trends.
* **Roles:** Data analysts, researchers, or climbers interested in understanding the impact of weather on climbing success.

**Task 2: Visualize Trends in Weather Conditions over Time**

* **Goal:** Identify temporal patterns and trends in weather conditions to understand seasonal variations and potential climatic changes.
* **Means:** Create line charts or time series plots to visualize changes in temperature, humidity, wind speed, and solar radiation over time.
* **Characteristics:** This task seeks to learn about long-term trends, cyclical patterns, and any anomalies or outliers in the weather data.
* **Target Data:** Historical weather data.
* **Workflow:** This task is performed during the exploratory data analysis phase or when monitoring weather trends over specific time periods.
* **Roles:** Climatologists, meteorologists, or researchers studying climate change and its impact on mountain environments.

**Task 3: Identify Optimal Weather Conditions for Climbing**

* **Goal:** Determine the ideal weather conditions for maximizing summit success rates, helping climbers plan their ascents more effectively.
* **Means:** Analyze historical climbing records to identify weather conditions associated with the highest success rates across different climbing routes.
* **Characteristics:** This task seeks to learn about the specific thresholds or ranges of weather variables (e.g., temperature, wind speed) that are conducive to successful climbs.
* **Target Data:** Historical weather data and climbing records.
* **Workflow:** This task involves data analysis and visualization to identify patterns and trends in summit success rates under various weather conditions.
* **Roles:** Climbers, expedition leaders, or guide services interested in optimizing climbing strategies based on weather forecasts and historical data.

Here are some low-fidelity prototypes for addressing these tasks:

1. **Correlation Analysis Prototype:**
   1. This prototype is designed to visualize the correlation between weather variables (such as temperature, humidity, wind speed, solar radiation) and summit success rates. It typically consists of a scatter plot matrix or correlation matrix where each weather variable is plotted against summit success percentage. The size, color, or shape of the data points may indicate the strength or direction of the correlation. This prototype helps analysts identify which weather variables have the strongest impact on summit success and can guide further analysis or modeling efforts.
2. **Weather Trends Visualization Prototype:**
   1. This prototype focuses on visualizing trends in weather conditions over time. It commonly includes line charts or time series plots showing how weather variables (e.g., temperature, humidity, wind speed) have changed over days, months, or years. These visualizations allow users to observe seasonal patterns, long-term trends, and any anomalies or outliers in the data. The prototype may also incorporate tools for filtering or zooming in on specific time periods to explore trends in more detail. This visualization is useful for climatologists, meteorologists, or researchers studying climate change and its impact on mountain environments.
3. **Optimal Weather Conditions Prototype:**
   1. This prototype illustrates a scatter plot showing summit success rates plotted against different weather variables (e.g., temperature, wind speed). The goal is to visually identify the ranges of weather conditions associated with the highest success rates, helping climbers make informed decisions about when to attempt their climbs.