**Project Charter: Global Climate Change Analysis**

**Project Title: Global Climate Change Analysis Using Data Visualization**

**Project Manager:**

Mohammad Malik Moin Siddique

**Project Team:**

* Data Analysts
* Climate Researchers
* Software Developers
* Visualization Experts

**Project Purpose & Justification:**

Climate change is one of the most pressing global challenges, with rising temperatures and extreme weather events becoming increasingly common. This project aims to analyze and visualize climate change data over the decades to identify key trends, extreme temperature events, and patterns in temperature distribution. By leveraging data science and visualization techniques, we hope to provide meaningful insights into global temperature changes and their implications.

**Project Objectives:**

1. **Analyse Global Temperature Trends** – Study how average temperatures have changed over different decades.
2. **Identify Extreme Temperature Spikes** – Detect significant variations in temperature and highlight years with abnormal spikes.
3. **Visualize Temperature Distribution** – Provide an overview of temperature variations using histograms.
4. **Show Temperature Change Over Time** – Illustrate how percentage changes in temperature fluctuate over the years.
5. **Provide Actionable Insights** – Help policymakers, researchers, and the public understand climate trends with clear and engaging visuals.

**Project Scope:**

**In-Scope:**

* Collecting and processing climate change data from historical records.
* Performing statistical analysis on temperature changes.
* Creating multiple visual representations of temperature trends and anomalies.
* Using Python (Matplotlib, Seaborn, Pandas) for data analysis and visualization.
* Delivering insights in an easy-to-understand manner through interactive graphs.

**Out-of-Scope:**

* Predicting future climate patterns.
* Policy recommendations or mitigation strategies.
* Advanced machine learning modelling for climate forecasting.

**Deliverables:**

* A comprehensive dataset prepared for analysis.
* Visual representations of climate change indicators (line plots, histograms, bar charts).
* A structured report summarizing key findings and insights.
* A codebase that can be reused or extended for further analysis.

**Constraints:**

* Availability and quality of historical climate data.
* Computational limitations when handling large datasets.
* Accuracy of temperature change calculations based on available data.

**Assumptions:**

* The dataset used accurately represents global temperature changes.
* The methodology applied (statistical and visual techniques) is sufficient for trend analysis.
* Stakeholders will use the insights from this project for awareness and further research.

**Risks:**

* **Data Quality Issues** – Missing or inconsistent data could affect the accuracy of analysis.
* **Misinterpretation of Visuals** – Incorrect conclusions could be drawn if the visualizations are not clear.
* **Technical Challenges** – Issues with data processing, visualization libraries, or computational power.

**Stakeholders:**

* Climate researchers and environmental scientists.
* Government policymakers working on climate regulations.
* Data scientists and analysts interested in climate trends.
* General public and media for awareness on climate change.

**Project Timeline & Milestones:**

| **Milestone** | **Estimated Completion** |
| --- | --- |
| Data Collection & Cleaning | Week 1 – 2 |
| Exploratory Data Analysis | Week 3 |
| Data Visualization & Graphs | Week 4 – 5 |
| Report Generation | Week 6 |
| Final Review & Presentation | Week 7 |

**Success Criteria:**

The project will be considered successful if:  
✔ The dataset is cleaned and structured for analysis.  
✔ Key climate trends and extreme events are clearly visualized.  
✔ The visualizations provide meaningful insights to stakeholders.  
✔ The project findings contribute to climate awareness and further research.