Project Guideline: Idea Proposal Submission

Team Members:

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1. Project Idea: Floods Path Predictor

- Flooding affects millions worldwide, especially in areas with extreme weather. This project will create a tool to predict flood paths by analyzing data like rainfall, river flow, and land features. By identifying where flooding is likely to happen, this tool can help local communities and government agencies prepare in advance, reducing harm to people and property.

2. Relevance to Sustainable Development Goals (SDGs):

- Explain how your project idea is relevant to the United Nations Sustainable Development Goals (SDGs). Consider how your project can contribute to achieving sustainability in areas like poverty reduction, environmental conservation, health, education, etc.

- This project aligns with **SDG 13: Climate Action** by helping communities respond to climate-driven floods. It also supports **SDG 11: Sustainable Cities and Communities** by improving disaster planning. Additionally, by reducing flood damage, it indirectly supports **SDG 1: No Poverty** and **SDG 3: Good Health and Well-being** by helping protect people and their livelihoods from flood-related risks.

3. Literature Examples:

- Hurricane Forecasting: A Novel Multimodal Machine Learning Framework
    - This paper describes a novel machine learning (ML) framework for tropical cyclone intensity and track forecasting, combining multiple ML techniques and utilizing diverse data sources. Our multimodal framework, called Hurricast, efficiently combines spatial–temporal data with statistical data by extracting features with deep learning encoder–decoder architectures and predicting with gradient-boosted trees.

- Flood Prediction using Hydrologic and ML-based Modeling: A Systematic Review
    - his study provides a comprehensive review of the latest modeling techniques used in flood prediction, classifying them into two main categories: hydrologic models and machine learning models based on artificial intelligence. By objectively assessing the advantages and disadvantages of each model type.

4. Describe Your Data:

- This project will use several types of data: weather data (such as rainfall and temperature), river levels, and land elevation. These datasets will come from government sources in CSV format.

- Global Floods Database

- Flood Observatory

5. Approach (Machine Learning or Deep Learning):

- Based on the data we currently have we will probably use machine learning, but there is a possibility that we may end up using deep learning if we can.