Project on Environment & Climate

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Primary SDG: SDG 13 – Climate Action

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1. Problem Statement

Climate change has increased the frequency of extreme weather events, rising carbon emissions, and lack of public awareness about sustainable practices. Communities often do not have access to simple tools for flood risk prediction, understanding their carbon footprint, or learning about climate change in an easy and interactive manner.

Problem Statement:
How might we use AI to predict flood risks, estimate carbon footprint, and spread climate change awareness so that communities can take timely and sustainable actions to reduce environmental impact?

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2. Detailed Solution Description

This project presents **three AI-based sustainability tools** designed to address environmental challenges:

2.1 Flood Risk Prediction Assistant

The system takes environmental inputs such as rainfall, river level, and soil moisture to predict flood risk levels (Low, Moderate, High). This helps communities and authorities take early precautionary measures.

2.2 Carbon Footprint Calculation Tool

This tool estimates an individual's monthly carbon footprint based on electricity usage, travel distance, and waste generation. It helps users understand how daily activities contribute to climate change and encourages eco-friendly behavior.

2.3 Climate Change Awareness Chatbot

A conversational AI chatbot that answers basic questions related to climate change, carbon footprint, renewable energy, and sustainable practices. It spreads awareness in a simple and interactive manner.

Together, these tools demonstrate how AI can be used responsibly to **predict risks, analyze environmental impact, and educate users**, contributing to sustainability goals.

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3. AI Elements and Tools Used

- **Programming Language:** Python
- **AI Techniques Used:**
  - Rule-based prediction logic
  - Classification-based decision making
  - Conversational AI (chatbot logic)
- **AI Concepts Applied:**
  - Automation
  - Pattern-based prediction
  - Decision support systems
- **Tools & Technologies:**
  - Python functions
  - Conditional logic
  - User input processing via command line

The project focuses on **logical AI workflows rather than complex machine learning**, as recommended in the internship guidelines.

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4. Images or Videos of Prototype / Demo

The project includes:

- Screenshots of Python code execution
- Sample inputs and outputs for:
  - Flood risk prediction

```
Enter rainfall (mm):  245
Enter river level (m):  15
Enter soil moisture (%):  50

Flood Risk Prediction: MODERATE Flood Risk
```

  - Carbon footprint calculation

```
Electricity used (units/month):  34
Travel distance (km/month):  4
Waste generated (kg/month):  2

Estimated Monthly Carbon Footprint: 29.62 kg CO2
```

- Climate awareness chatbot conversation

```
Climate Change Awareness Chatbot
Type 'exit' to stop

You:  climate change
Bot: Climate change refers to long-term changes in temperature and weather patterns.
You:  carbon footprint
Bot: Carbon footprint is the total greenhouse gas emissions caused by human activities.
You:  how to reduce
Bot: You can reduce emissions by saving energy, using public transport, and reducing waste.
You:  renewable energy
Bot: Renewable energy comes from natural sources like solar, wind, and hydro power.
You:  exit
Bot: Thank you for supporting climate action
```

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5. GitHub / Prototype / Demo Links (if applicable)

- **Prototype Type:** Python-based command-line AI prototype

GitHub Link: https://github.com/Sandrabindhu/1M1B-AI-for-Sustainability-Virtual-Internship-with-IBM-SkillsBuild-AICTE.git