Project on Environment & Climate

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PRIMARY SDG: SDG 13 – CLIMATE ACTION

The Climate Challenge

Extreme weather, rising carbon emissions, and a lack of public awareness about sustainable practices are pressing issues. Communities often lack simple tools for flood risk prediction, understanding their carbon footprint, or learning about climate change interactively.

How might AI help communities take timely and sustainable actions to reduce environmental impact?

AI-Powered Sustainability Tools

This project introduces three AI-based sustainability tools designed to address critical environmental challenges.

Flood Risk Prediction

Early warnings for communities.
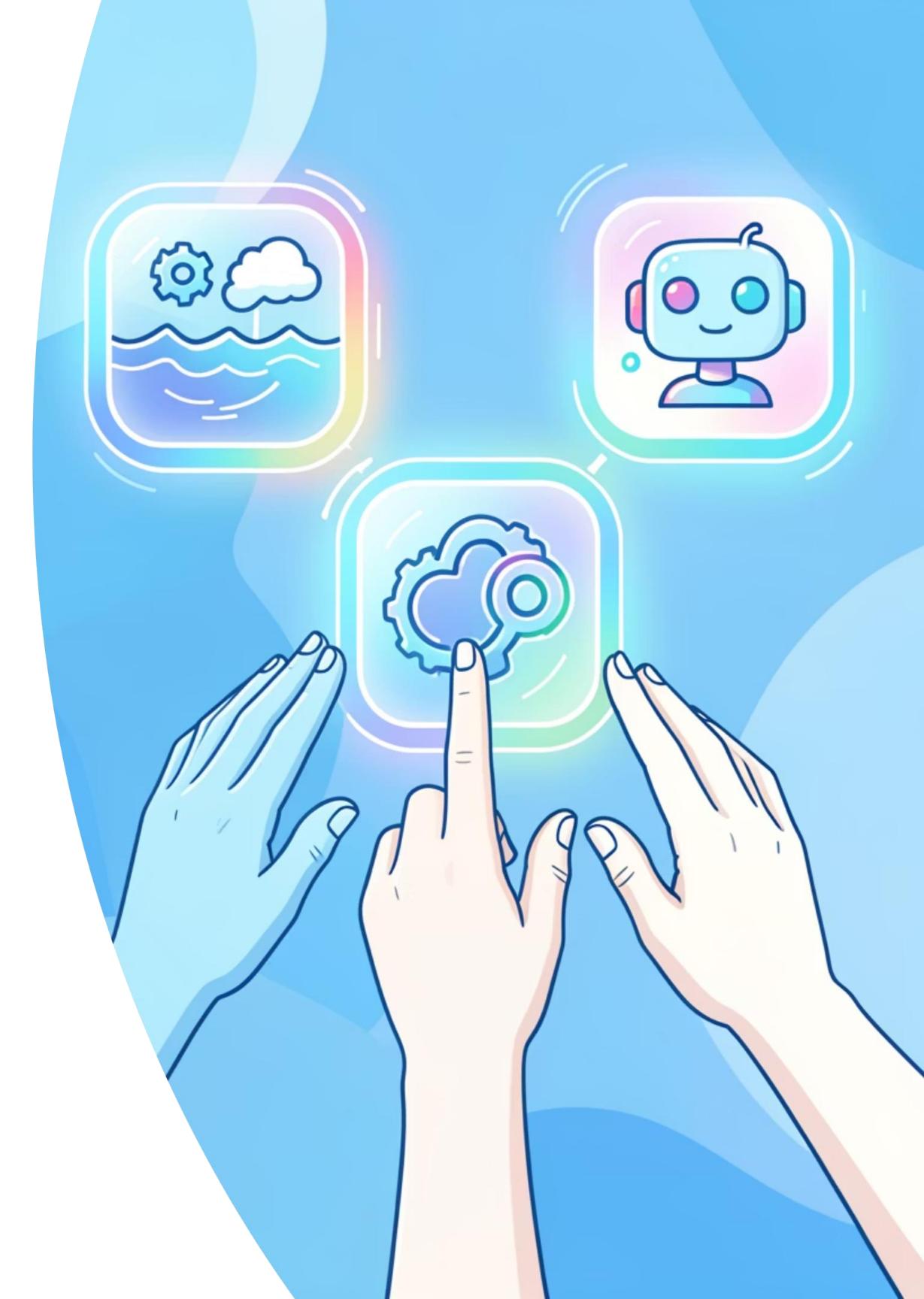
Carbon Footprint Tool

Understand personal impact.

Climate Awareness Chatbot

Interactive education for all.

Flood Risk Prediction Assistant

This system predicts flood risk levels (Low, Moderate, High) based on environmental inputs like rainfall, river level, and soil moisture.

It empowers communities and authorities to implement early precautionary measures, safeguarding lives and property.
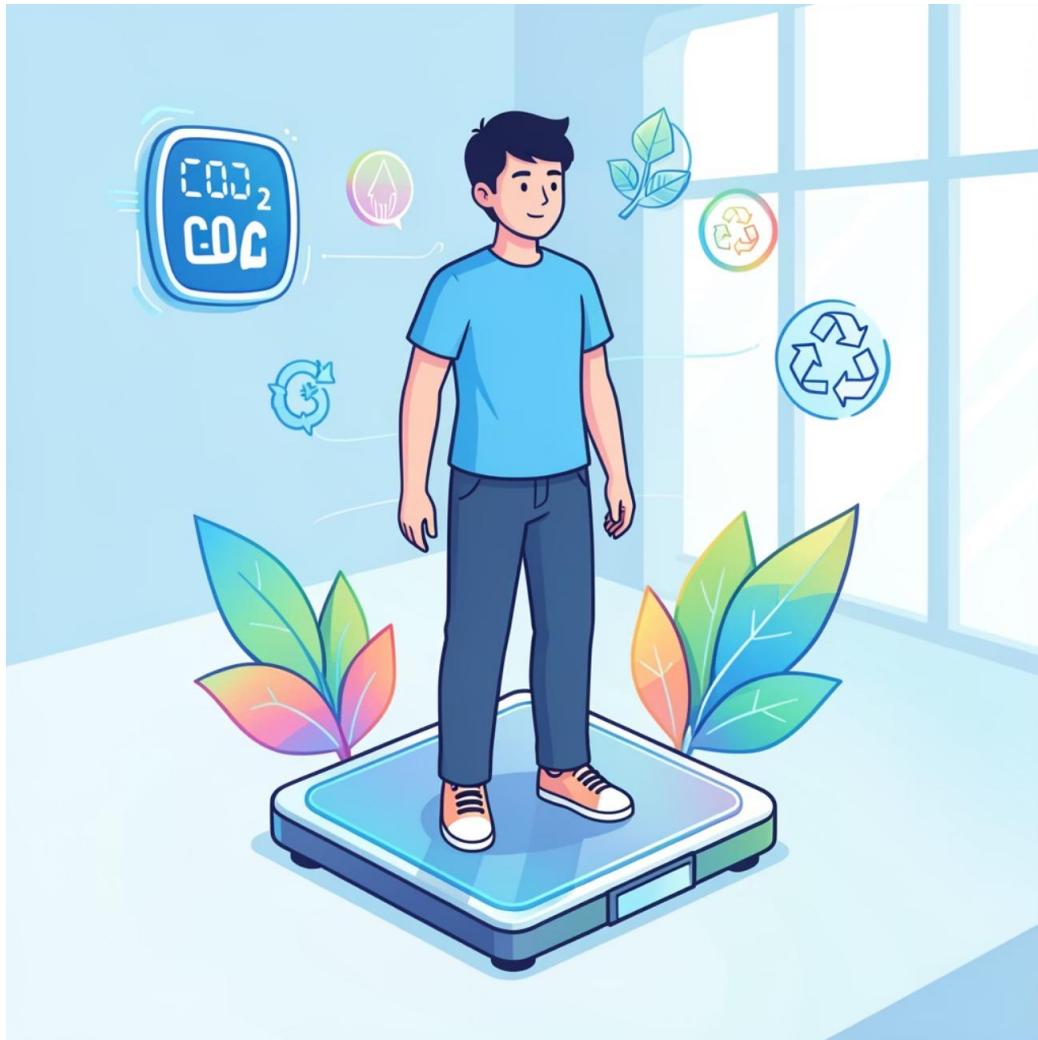
Key Inputs

- Rainfall (mm)
- River Level (m)
- Soil Moisture (%)

Outputs

Flood Risk Level: **Low, Moderate, High**

Carbon Footprint Calculation Tool

This tool estimates an individual's monthly carbon footprint, helping users understand how daily activities contribute to climate change.

It encourages eco-friendly behavior by highlighting the impact of electricity usage, travel distance, and waste generation.

Factors Analyzed
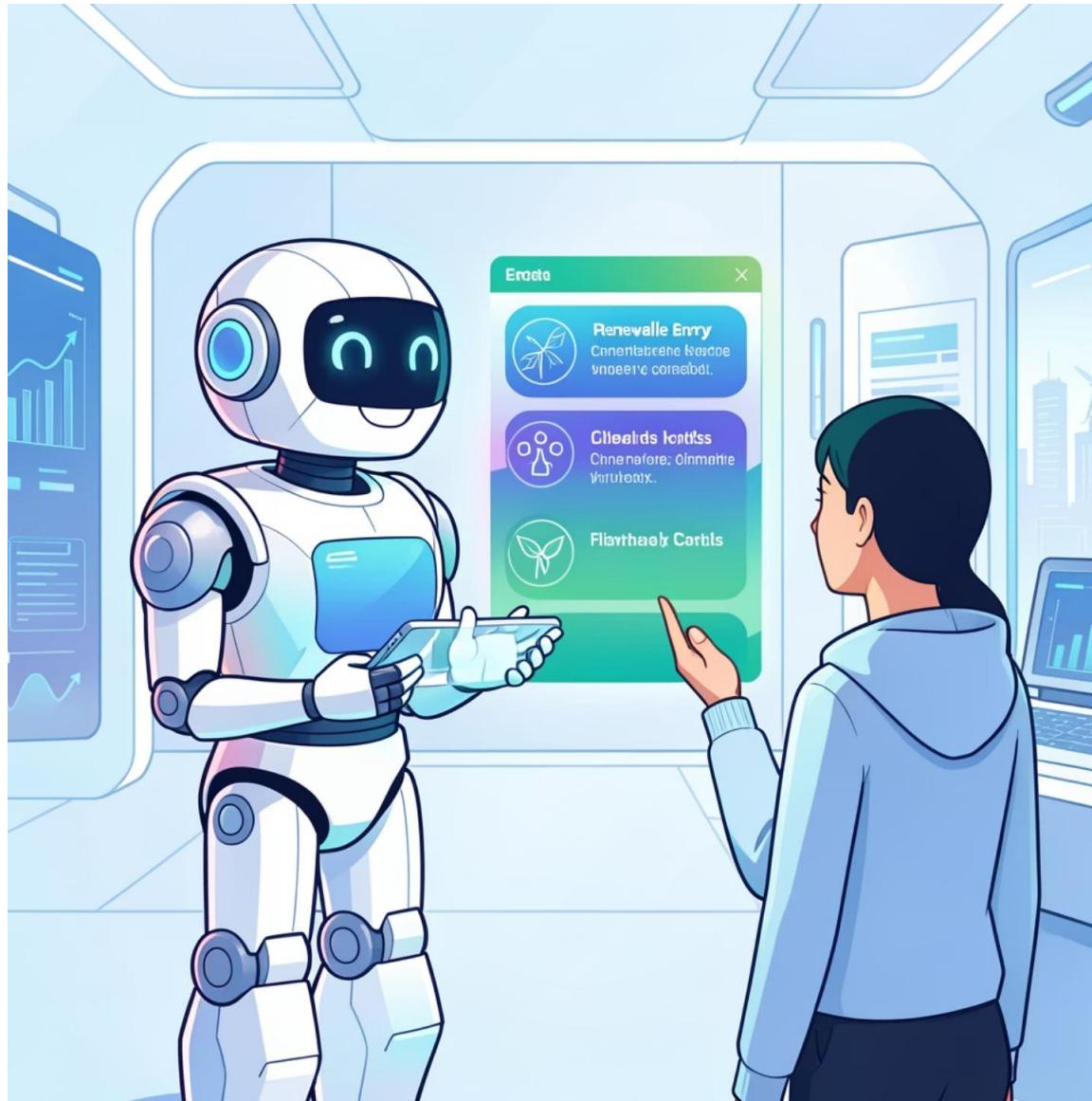
- Electricity Usage
- Travel Distance
- Waste Generation

Goal

Promote eco-conscious choices.

Climate Change Awareness Chatbot

A conversational AI chatbot designed to spread awareness about climate change in a simple and interactive manner.

Topics Covered

- Climate Change Basics
- Carbon Footprint
- Renewable Energy
- Sustainable Practices

Interactive Learning

Answers questions to foster understanding and engagement.

AI Elements & Tools

The project leverages logical AI workflows, focusing on practical application rather than complex machine learning, as per internship guidelines.

Programming Language

Python

AI Techniques

Rule-based prediction, Classification, Conversational AI

AI Concepts

Automation, Pattern-based prediction, Decision support

Technologies

Python functions, Conditional logic, Command-line processing

Prototype Demo: Flood Risk

Sample input and output for the Flood Risk Prediction Assistant.

Input Example

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


Output Example

```
Flood Risk Prediction: MODERATE Flood Risk
```

Prototype Demo: Carbon Footprint & Chatbot

Sample interactions with the Carbon Footprint Calculation Tool and Climate Awareness Chatbot.
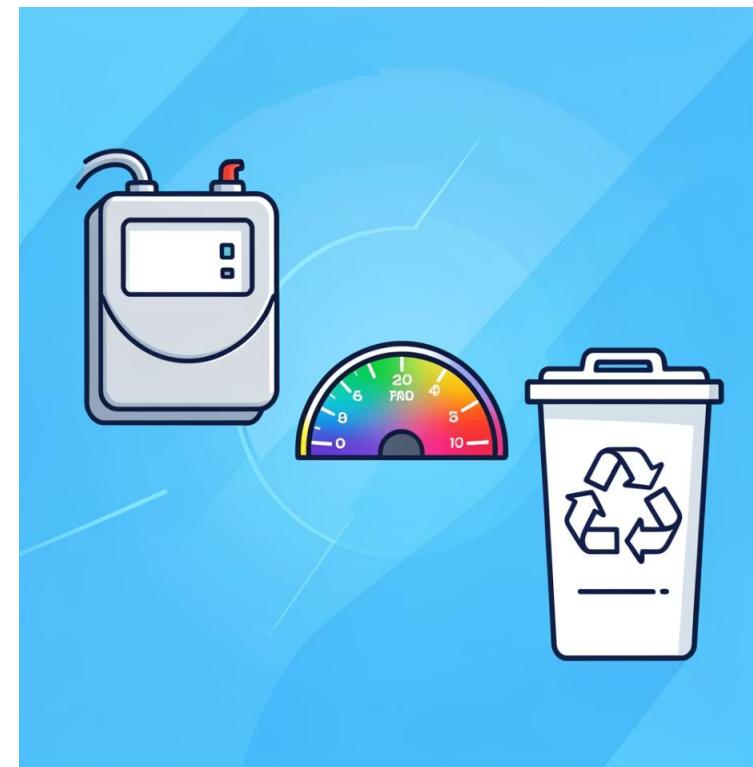
Carbon Footprint

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

Estimated Monthly Carbon Footprint: 29.62 kg CO2
```


Chatbot Conversation

```
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: exit
Bot: Thank you for supporting climate action
```
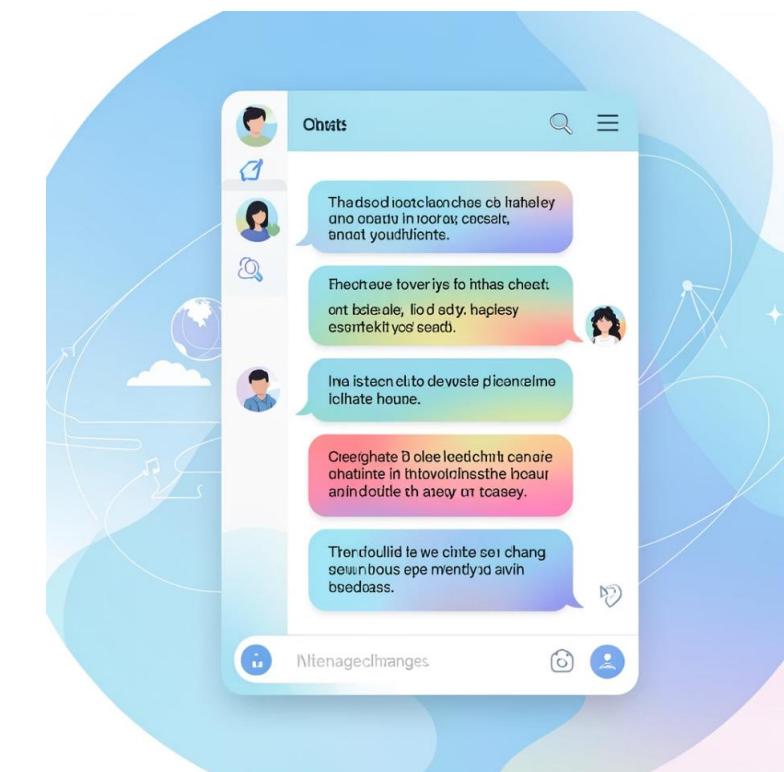
Project Repository

Explore the Python-based command-line AI prototype on GitHub.

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

These tools demonstrate how AI can responsibly predict risks, analyze environmental impact, and educate users, contributing to sustainability goals.