Project Report 1: Text Generation Application

Objective

The objective of this project is to develop a text generation application using open-source generative AI models such as Falcon, Gemini, and Bloom. The application will feature a user interface for inputting prompts related to the Sustainable Development Goals (SDGs) and will generate text continuations. We will evaluate the performance of different models based on criteria like coherence, creativity, relevance, and grammatical correctness.

Development Process

1. **Model Selection**
   - Chose three open-source models for text generation: **Falcon**, **Gemini**, and **Bloom**.
   - Each model is known for its distinct approach to generating coherent and contextually relevant text.
2. **User Interface Implementation**
   - Designed a simple web-based UI using **React** for user input.
   - Users can enter a prompt (e.g., related to SDGs) and select a model to generate text.
3. **Model Integration**
   - Integrated models using APIs:
     - **Falcon** and **Bloom** were accessed via Hugging Face's Transformers library.
     - **Gemini** was accessed through an open-source implementation.
   - Implemented backend logic to handle user requests, generate text, and display results on the UI.
4. **Performance Evaluation Criteria**
   - Defined the following evaluation metrics:
     - **Coherence**: Logical flow and consistency of the generated text.
     - **Creativity**: Novelty and originality in the generated content.
     - **Relevance**: How well the generated text aligns with the prompt.
     - **Grammatical Correctness**: Proper use of grammar and syntax.
   - Conducted manual evaluations using a scoring scale from 1 (Very Poor) to 5 (Excellent) for each metric.

Results

Model	Prompt	Coherence	Creativity	Relevance	Grammatical Correctness	Average Score
Bloom	"What are the challenges in achieving zero hunger?"	5	4	5	5	4.75
Falcon	"What are the challenges in achieving zero hunger?"	4	3	4	5	4.00

- **Bloom** also delivered strong results but scored slightly lower in creativity.
- **Falcon** showed moderate performance, especially in terms of creativity and relevance.