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TEXT COMPLETION GENERATOR - GEN AI PROJECT PHASE 3 SUBMISSION DOCUMENT

Phase 3: Final Report and Submission

1. Project Title:

Complete Sentence Prediction using Generative AI

2. Summary of Work Done

Phase 1 – Proposal and Idea Submission:
In this phase, we proposed building a complete Sentence Prediction system using Generative AI, with a focus on GPT-based models. We defined clear objectives:

- Understand the functioning of generative language models.
- Use pre-trained models to generate context-aware continuations.
- Build a user interface to interact with the system.

A formal proposal was submitted outlining the problem, objectives, solution approach, and technologies to be used.

Phase 2 – Execution and Demonstration:
In this phase, we implemented the system using:

- Google Colab (as the development environment)
- HuggingFace Transformers (GPT-2)
- IPyWidgets for interactive user input/output

Key accomplishments:

- Designed an input-output interface using widgets.
- Loaded and used the GPT-2 model to generate a single coherent complete sentence.

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- Integrated model logic with a clean interface.
- Displayed the generated sentence within a styled output box in real-time.

3. GitHub Repository Link:

You can access the complete codebase, README instructions, and other resources at the following GitHub link:
https://github.com/AyushiSharma0407/Sentence-Completion

4. Testing Phase

4.1 Testing Strategy:

We used a variety of test cases and input types to ensure the system works effectively, including:

- Sentence fragments
- Complete sentences
- Long and short prompts
- Edge-case nonsense inputs

4.2 Types of Testing Conducted:

- **Unit Testing:**
  Verified core components such as text generation, prompt handling, and output formatting.
- **Integration Testing:**
  Confirmed smooth integration between model loading, text completion logic, and Colab interface.
- **User Testing:**
  Peer feedback was collected on usability and relevance of sentence completions.
- **Performance Testing:**
  The system was tested for response speed and consistency across varying input

lengths.

4.3 Results:

- **Accuracy:**
  The model reliably generated contextually appropriate complete sentences.
  Example:
  Input: "The sun was setting over the hills and"
  Output: "the sky turned a brilliant shade of orange."

- **Response Time:**
  Predictions were typically generated within 1–2 seconds.

- **Edge Case Handling:**
  While gibberish inputs yielded less coherent results, the system always returned a valid response, demonstrating robustness.

5. Future Work

- **Fine-Tuning the Model:**
  Adapt GPT-2 to specific domains for more focused sentence completions.

- **Web Interface (e.g., Streamlit or Flask):**
  Extend the project to a browser-accessible app.

- **Multilingual Support:**
  Add multilingual capabilities using models like mBART or mT5.

- **Collaborative Writing Mode:**
  Enable multiple users to co-create content using real-time interactions.

- **User Feedback Integration:**
  Allow users to rate or flag responses to help the model adapt over time.

6. Conclusion

This project demonstrates a successful implementation of a Complete Sentence Prediction system using Generative AI. The final model and UI combine NLP and user interactivity to offer a practical application of GPT-2. From conception to testing, the project showcases how transformer-based models can be leveraged for intelligent text completion in real-world use cases.