

AI Text Completion Project Report

Objective

The main goal of this project was to make a basic text completion application with the use of Generative AI and to test its abilities. The project gave us hands-on experience with API interaction, prompt design, and model tuning using a pre-trained language model which I chose to use OpenAI (GPT-3.5). Through this exercise, I learned how Generative AI produces coherent and contextually appropriate responses based on user prompts.

Part 1: Building the Application

I chose OpenAI's GPT-3.5 model to build the application. I used the official openai Python library and stored my API key securely using an environment variable. The application was designed to:

- Accept a prompt from the user via the terminal.
- Allow customization of temperature (creativity) and max_tokens (length).
- Send the prompt to the GPT API.
- Display the response.

Error handling was implemented for:

- Missing or invalid inputs.
- API errors or connection issues.

This application runs in a loop, allowing multiple prompts in one session.

Part 2: Debugging and Improvements

During development, I encountered common issues:

- The initial code used an outdated openai.ChatCompletion method incompatible with version $\geq 1.0.0$. I resolved this by updating to the new openai.chat.completions.create() syntax.

- Before purchasing OpenAI credits, I tried running the program to make sure it would work without having to use any money. So initially, I had errors due to a missing API key which I fixed once I was confident with my code.
- I also implemented input fallback values for temperature and max tokens if the user leaves those fields blank or enters invalid data.

Part 3: Prompt Testing and Evaluation

I tested five distinct prompts using different temperatures and token lengths. Here are the results:

Prompt	Temperature	Max Tokens	Response Summary
Explain photosynthesis to a 10-year-old	0.5	100	Simple, friendly explanation comparing it to a magic trick.
Once upon a time, there was a robot who...	0.2	60	Calm, linear story setup with character development.
The dragon peered over the cliff and saw...	0.9	80	Creative, vivid storytelling with rich description.
Summarize the causes of climate change	0.4	100	Accurate factual summary, listing key human-related causes of global warming.

These tests demonstrate how temperature affects creativity and how max tokens limit response length. Lower temperature produced more predictable responses, while higher values produced a more creative response.

Part 4: Reflection and Limitations

Strengths:

- GPT-3.5 consistently generated relevant and grammatically correct responses.
- It was flexible across storytelling, explanation, and summarization tasks.

Limitations:

- It sometimes cuts off sentences due to token limits.
- Higher temperature occasionally led to overly abstract or inconsistent responses.
- The model lacks real-time awareness or source citations, so factual validation is needed for critical use cases.

Improvement Suggestions:

- Implement response truncation warnings or retries.
- Add a “save history” feature for prompts and outputs.
- Consider adding prompt templates for more structured input.

Conclusion

This project successfully demonstrated how to build, interact with, and evaluate a Generative AI model. I gained valuable experience in API usage, prompt engineering, and handling model parameters. Overall, it was a practical introduction to modern AI development using OpenAI and Python.