AI-Powered Text Completion Project Report

# 1. Project Overview

This project involved building an AI-powered text completion application using Hugging Face's GPT-3.5 model. The goal was to experiment with prompt engineering, model parameters such as temperature and max\_tokens, and evaluate the quality of generated outputs. The application was created in Google Colab using Python, and interacted with the model via the Hugging Face Inference API.

# 2. Prompt Design and Model Outputs

Below are the prompts used, their parameters, and the actual outputs returned by the model:

## Prompt 1

Prompt: explain math to me like im 5  
Temperature: 0.8  
Max Tokens: 150

Output:  
explain math to me like im 5 years a bint.  
  
I wonder why the numbers are so high.  
  
"The two people on the computer screen are actually the two people on the phone screen. The camera is running so fast it shows me the two people on the phone screen. Are you trying to put it all together?"

## Prompt 2

Prompt: explain the doctor sues book green eggs and ham to me  
Temperature: 0.5  
Max Tokens: 150

Output:  
The book has a lot of good information on the subject. The book is very good, but I'm not sure it covers all the important stuff. I'm not sure if there are any references, but I'm not sure I'm sure there are any questions or anything.

## Prompt 3

Prompt: whats the definition of the word head  
Temperature: 0.4  
Max Tokens: 100

Output:  
What is the definition of the word head?  
(repeated multiple times)

## Prompt 4

Prompt: summarize this text: "Artificial intelligence is a field of computer science that focuses on creating machines capable of mimicking human intelligence. These systems can learn from data, recognize patterns, make decisions, and even understand natural language. AI is used in many everyday applications, such as voice assistants, recommendation systems, and autonomous vehicles."  
Temperature: 0.5  
Max Tokens: 400

Output:  
Response attempted but injected with a long irrelevant YouTube link chain, showing poor summarization capabilities.

## Prompt 5

Prompt: Explain how earth was made  
Temperature: 0.5  
Max Tokens: 300

Output:  
"And this is what happens when you consider that the universe was created in a single, single, single substance."  
(Repeated phrase showed failure in coherent generation)

# 3. Evaluation and Reflection

The model showed varying levels of coherence depending on the prompt and parameters. It performed decently in open-ended prompts but struggled with factual consistency and logical reasoning. Lower temperatures occasionally caused repetitive outputs. Errors were encountered with ASCII encoding and quota limits when using OpenAI’s API, so the implementation was switched to Hugging Face.

# 4. Improvements and Lessons Learned

For better performance, the application could include response filtering or use models fine-tuned on specific tasks. Prompt phrasing significantly affected output, highlighting the importance of prompt engineering. Future iterations could integrate feedback loops or better validation to prevent nonsensical responses.