Capstone Project: AI-Powered Text Completion Assignment Recap & Report

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Introduction: For this final experiment, I decided to go with OpenAI's GPT-4o model, and purchased a cheap plan that would allow for a reasonable amount of testing. The OpenAI website provides easy and clear documentation on how to make calls to the model in a python environment, which greatly simplified the process.

Debugging and Improving the Application: The main setup requirement for this experiment was learning how to securely store the API key so that it could still be utilized within my environment. I managed to save it as a local environment variable using my PowerShell terminal, which was able to be referenced in my code. I added user prompts for the prompt, temperature, max tokens, and top_p as the instructions intended and was quickly able to jump into experimentation.

Observations: I observed five main outputs, each listed below in the "output" section. I mixed and matched the parameters of each call, hoping to make some observations. In attempt 1, I asked the model to finish the story "i woke up and…" with temperature 1.0, token 2048, and top_p 1.0. These settings seemed to provide a normal and interesting response from the model. The story was interesting and creative, while still coherent and on topic. On attempt 2, I lowered the temperature to 0.2, and the response seemed to be stable, but a little less exciting. I wanted to see what would happen if we instead raised temperature, and set attempt 4 with its "explain generative AI in 100 words or less" prompt to a temp of 2.0. As seen below, I was met with an incoherent response with various words and symbols from different languages. From these results, it seems like temperature has a direct correlation to the stability of what is returned. The lower the temperature, the more stable, albeit less creative the response. Top_p seems to follow a similar pattern, although it was much less pronounced.

Improvements: Ultimately, the model seemed to perform best on simple questions and queries. Things it is familiar with that may be regularly asked by other users result in the best responses. If I were to improve the app, I could manipulate the prompt in a way to coerce a better response (like "pretend you are an expert in this topic and only give a response that an expert in the field would endorse:", prompt). Some kind of filtering of the output could also work, especially as seen with the random response in attempt 4.

Conclusions: This was a fun and simple project that really gave me some insight into how to make API calls to GPT, and what specifying and adjusting a few of the common hyperparameters might do. I plan to implement AI-text completion in a different personal project of mine, which this experiment has given me the inspiration for.

Outputs: (see next page and beyond)

Attempt 1:

continue this story… i woke up and
1.0; 2048; 1.0

I woke up and immediately sensed that something was off. The air felt unusually still and heavy, almost as if the world was holding its breath. I blinked a few times, trying to shake off the grogginess that clung to me. Sunlight streamed through a crack in the curtains, casting a warm stripe across the bedspread.

As I sat up, I noticed how quiet it was; no birds chirping, no distant hum of traffic. The silence felt unnatural, almost oppressive. I swung my legs over the side of the bed and winced as my feet touched the cold hardwood floor.

As I made my way to the kitchen, I noticed a faint smell of smoke. My heart rate quickened as I checked each room, but everything seemed in order—no sign of fire, no telltale scorch marks. Yet the smell lingered, elusive and unsettling.

In the kitchen, I poured myself a glass of water, trying to calm the uneasy knot in my stomach. That's when I saw it: an envelope on the table, something that hadn't been there the night before. It was plain white, with my name scrawled in an unfamiliar handwriting across the front.

With trembling hands, I opened the envelope and pulled out a single sheet of paper. The message, composed of words clipped from magazines and newspapers, read: "They are coming. Trust no one."

I sat down, rereading the cryptic note, my mind racing with questions. Who were 'they,' and why was I warned about them? Suddenly, a soft knock on the door interrupted my thoughts, and my heart skipped a beat.

I hesitated, then approached the door quietly, peering through the peephole. A shadowy figure stood just beyond the threshold, their face obscured beneath the hood of a dark sweatshirt.

The figure knocked again, more insistently this time. I stepped back, clutching the note, and tried to steady my breath. Whoever they were, whatever they wanted—I had the sinking feeling I was about to find out.

Attempt 2:

continue this story… i woke up and
0.2; 2048; 1.0

I woke up and found myself enveloped in the soft glow of the morning sun filtering through the curtains. The room was quiet, save for the gentle rustling of leaves outside the window. As I stretched, I felt a sense of calm and contentment, a rare feeling in the hustle and bustle of everyday life.

I swung my legs over the side of the bed and felt the cool wooden floor beneath my feet. The air was crisp, carrying the faint scent of blooming flowers from the garden below. I padded over to the window and pulled back the curtains, revealing a world that seemed to be waking up with me. Birds flitted from branch to branch, their songs weaving a melody that filled the morning air.

As I stood there, taking in the serene beauty of the world outside, a thought struck me. Today was the day I had promised myself to embark on a new adventure, to step out of my comfort zone and explore the unknown. The idea had been simmering in the back of my mind for weeks, and now it was time to turn it into reality.

I quickly dressed and made my way to the kitchen, where the aroma of freshly brewed coffee greeted me. I poured myself a cup and took a moment to savor the rich, comforting flavor. With a renewed sense of purpose, I grabbed my backpack, filled it with essentials, and headed out the door.

The world outside was alive with possibilities, and as I walked down the familiar path, I felt a thrill of excitement coursing through me. Today was the beginning of something new, a journey that promised to change me in ways I couldn't yet imagine. With each step, I felt more alive, more connected to the world around me.

As I reached the edge of the forest, I paused for a moment, taking in the towering trees and the dappled sunlight that danced across the forest floor. This was it—the start of my adventure. With a deep breath, I stepped forward, ready to embrace whatever lay ahead.

Attempt 3:

Explain generative AI in 100 words or less
0.5; 2048; 1.0

Generative AI refers to artificial intelligence systems designed to create new content, such as text, images, music, or code, by learning patterns from existing data. These models, like GPT-3 or DALL-E, use deep learning techniques, particularly neural networks, to understand and mimic human-like creativity. By analyzing vast datasets, generative AI can produce coherent and contextually relevant outputs, making it valuable for applications in art, design, content creation, and more. Its ability to generate novel and diverse outputs distinguishes it from traditional AI, which typically focuses on classification or prediction tasks.

Attempt 4:

Explain generative AI in 100 words or less
2.0; 2048; 1.0

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Attempt 5:

What is your message to the world?
1.0; 2048; 0.5

As an AI, I don't have personal beliefs or messages, but I can share some widely valued principles that many people find meaningful:

1. **Empathy and Understanding**: Strive to understand and empathize with others. Everyone has a unique story and perspective.

2. **Sustainability**: Protect and preserve our planet for future generations. Small actions can lead to significant changes.

3. **Continuous Learning**: Embrace lifelong learning and remain curious. Knowledge and understanding can drive positive change.

4. **Kindness and Compassion**: Small acts of kindness can have a big impact. Treat others with compassion and respect.

5. **Collaboration and Unity**: Work together to solve global challenges. We are stronger when we unite our efforts.

6. **Innovation and Creativity**: Encourage innovation and creativity to address the world's challenges and improve quality of life.

7. **Resilience and Hope**: Stay resilient in the face of adversity and maintain hope for a better future.

These principles can help foster a more harmonious and progressive world.