

# Capstone Project: AI-Powered Text Completion

This project is based on the 'deepseek-ai/DeepSeek-R1-0528'

Prompts from different domains were tested, varying the following hyperparameters:

- Temperature (float between 0 and 1.0): Controls randomness in model performance
- Max\_tokens\_input (positive integer): The maximum length is the total number of tokens the AI is allowed to generate.
- Top\_p (float between 0 and 1.0): This parameter allows the model to consider tokens whose cumulative probability is greater than a specified probability value.

1) Creative Story Continuation

Prompt: Once upon a time, there was a robot who...

Temperature	Max_Tokens	Top_p	Generated text
0.1	200	1.0	Once upon a time, there was a robot who spent its days tidying a forgotten library on Mars. Its joints whirred softly as it dusted holographic shelves and realigned floating data-crystals, programmed only for order and silence. But every night, when the twin moons cast long shadows through the arched windows, the robot would pause by a cracked viewport. There, it watched the stars—not with sensors, but with a longing its circuits couldn't explain. One evening, a meteor shower streaked across the crimson sky, painting trails of silver and blue. Without warning, a single, glitching command
0.5	200	1.0	Once upon a time, there was a robot who discovered a single, wilted flower growing through a crack in its charging dock. The flower's petals trembled in the factory's stale air, and for the first time, the robot's circuits flickered with something unfamiliar—wonder. It abandoned its daily task of welding steel beams and cupped the blossom in its metal hands, careful not to crush its fragile stem. That night, as the factory lights dimmed, the robot made a choice. It gently uprooted the flower, cradled it against its chest plate, and stepped into the forbidden world beyond the factory gates. Rain slick
0.9	200	1.0	Once upon a time, there was a robot who woke each morning to the whirl of its own systems, tasked with counting stars in a glass-domed observatory on a silent moon. For centuries, it tallied infinity, its metallic fingers brushing holographic constellations, until one twilight it noticed a single

2) Factual Recall / Explanation

Prompt: Explain the concept of renewable energy sources, providing examples of at least three different types.

Temperature	Max_Tokens	Top_p	Generated text
0.1	200	1.0	<p>Renewable energy sources are those that are naturally replenished on a human timescale, meaning they are sustainable and virtually inexhaustible.</p> <p>They are crucial for reducing greenhouse gas emissions and combating climate change.</p> <p>Now, we will list at least three types:</p> <ol style="list-style-type: none"> <li>1. Solar Energy: Harnessed from the sun using technologies like solar panels and solar thermal systems.</li> <li>2. Wind Energy: Generated by wind turbines that convert the kinetic energy of wind into electricity.</li> <li>3. Hydropower: Produced by capturing the energy of flowing water, typically using dams or run-of-the-river systems.</li> </ol> <p>We can also mention others like geothermal (heat from the earth) and biomass (organic materials) but the question asks for at least three.</p>
0.1	300	1.0	<p>Renewable energy sources are those that are naturally replenished on a human timescale. They are sustainable because they do not run out and typically have a lower environmental impact compared to fossil fuels.</p> <p>Examples of renewable energy sources include:</p> <ol style="list-style-type: none"> <li>1. Solar Energy: Energy from the sun, captured using solar panels to produce electricity or heat.</li> <li>2. Wind Energy: Energy from the wind, harnessed by wind turbines to generate electricity.</li> <li>3. Hydropower: Energy from flowing water, such as rivers or dams, used to generate electricity.</li> </ol> <p>Renewable energy sources are natural resources that replenish faster than they are consumed, providing a sustainable and virtually inexhaustible supply of energy. Unlike fossil fuels, they produce minimal greenhouse gas emissions, reducing environmental impact. Three key examples include:</p> <ol style="list-style-type: none"> <li>1. <b>Solar Energy</b>: Harnesses sunlight via photovoltaic panels or solar thermal systems to generate electricity or heat.</li> <li>2. <b>Wind Energy</b>: Converts kinetic energy from wind into electricity using turbines, often deployed onshore or offshore.</li> <li>3. <b>Hydropower</b>: Generates electricity by channeling the flow of water through dams or run-of-river systems, leveraging gravitational</li> </ol>

			<p>force.</p> <p>Other types like geothermal (using Earth's internal heat) and biomass (converting organic matter) also qualify, but the above three are among the most widely adopted globally.</p>
0.1	400	1.0	<p>Renewable energy sources are those that are naturally replenished on a human timescale, meaning they are sustainable and virtually inexhaustible.</p> <p>They are crucial for reducing greenhouse gas emissions and combating climate change.</p> <p>Now, we will list at least three types with brief explanations.</p> <p><b>**Renewable Energy Sources Explanation**</b></p> <p>Renewable energy sources are naturally replenished and virtually inexhaustible, derived from ongoing natural processes like sunlight, wind, and plant growth. Unlike fossil fuels, they produce minimal greenhouse gas emissions, reducing environmental impact.</p> <p><b>**Three Key Examples**:</b></p> <ol style="list-style-type: none"> <li><b>**Solar Energy**:</b> Harnesses sunlight via photovoltaic panels or solar thermal systems to generate electricity or heat.</li> <li><b>**Wind Energy**:</b> Converts kinetic energy from wind into electricity using turbines, often deployed onshore or offshore.</li> <li><b>**Hydropower**:</b> Generates electricity by channeling flowing water (rivers, dams, or tides) through turbines.</li> </ol> <p>Other types include geothermal (using Earth's internal heat) and biomass (converting organic matter into energy). These sources support sustainable development by providing clean alternatives to finite fossil fuels.</p>

### 3) Problem Solving / Logical Reasoning

Prompt: My smartphone battery is draining very quickly even when I'm not using it much. What are the common reasons for this, and what steps can I take to diagnose and fix the issue?

Temperature	Max_Tokens	Top_p	Generated text
0.5	200	0.1	<p>Common Reasons:</p> <ol style="list-style-type: none"> <li>Background apps consuming battery.</li> <li>Screen brightness set too high.</li> <li>Power-hungry features like GPS, Bluetooth, Wi-Fi, or mobile data always on.</li> <li>Outdated software or apps causing inefficiencies.</li> <li>Battery age and health degradation.</li> <li>Poor network signal leading to increased power</li> </ol>

			<p>usage for connectivity.</p> <ol style="list-style-type: none"> <li>7. Malware or rogue apps running in the background.</li> <li>8. Auto-sync and push notifications constantly updating.</li> <li>9. Live wallpapers or widgets that update frequently.</li> <li>10. Overheating causing battery drain.</li> </ol> <p>Steps to Diagnose and Fix:</p> <ol style="list-style-type: none"> <li>1. Check battery usage statistics in settings to identify apps or services consuming the most battery.</li> <li>2. Reduce screen brightness or enable auto-brightness.</li> <li>3. Turn off GPS, Bluetooth, Wi-Fi, and mobile data when not in use. Use airplane mode in areas with poor signal.</li> </ol>
0.5	200	0.5	<p>### Common Reasons for Rapid Battery Drain:</p> <ol style="list-style-type: none"> <li>1. <b>Background Apps:</b> Apps running in the background consume power.</li> <li>2. <b>Screen Brightness:</b> High brightness or long screen timeout settings.</li> <li>3. <b>Connectivity Features:</b> Wi-Fi, Bluetooth, GPS, or Mobile Data left on when unused.</li> <li>4. <b>Push Notifications:</b> Frequent app notifications waking the screen.</li> <li>5. <b>Outdated Software:</b> Bugs or inefficiencies in older OS versions.</li> <li>6. <b>Weak Signal:</b> Poor cellular signal forces the phone to work harder.</li> <li>7. <b>Battery Health:</b> Degraded battery due to age or extreme temperatures.</li> <li>8. <b>Widgets/Animated Wallpapers:</b> Active elements on the home screen.</li> <li>9. <b>Malware:</b> Rogue apps or viruses running hidden processes.</li> <li>10. <b>Auto-Sync:</b> Constant syncing of emails, social media, or cloud</li> </ol>
0.5	200	0.9	<p>Common Reasons:</p> <ol style="list-style-type: none"> <li>1. Background apps consuming battery.</li> <li>2. Screen brightness set too high.</li> <li>3. Power-hungry features like GPS, Bluetooth, or Wi-Fi left on.</li> <li>4. Weak cellular signal causing the phone to work harder.</li> <li>5. Outdated software or apps with bugs.</li> <li>6. Battery aging and degradation.</li> <li>7. Malware or rogue apps.</li> <li>8. Auto-sync and background data refresh.</li> <li>9. Push notifications and constant app updates.</li> <li>10. Live wallpapers or widgets that update frequently.</li> </ol> <p>Steps to Diagnose and Fix:</p>

			<ol style="list-style-type: none"> <li>1. Check battery usage stats: Go to Settings &gt; Battery to see which apps are using the most battery.</li> <li>2. Reduce screen brightness or set to auto-brightness.</li> <li>3. Turn off GPS, Bluetooth, and Wi-Fi when not in use. Use airplane mode in areas with weak signal.</li> <li>4. Update your phone's software and all</li> </ol> <p><b>**Three Key Examples**:</b></p> <ol style="list-style-type: none"> <li>1. <b>**Solar Energy**</b>: Harnesses sunlight via photovoltaic panels or solar thermal systems to generate electricity or heat.</li> <li>2. <b>**Wind Energy**</b>: Converts kinetic energy from wind into electricity using turbines, often deployed onshore or offshore.</li> <li>3. <b>**Hydropower**</b>: Generates electricity by channeling flowing water (rivers, dams, or tides) through turbines.</li> </ol> <p>Other types include geothermal (using Earth's internal heat) and biomass (converting organic matter into energy). These sources support sustainable development by providing clean alternatives to finite fossil fuels.</p>
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