College Name – VIT Bhopal University
Student Name – Srishti Jitpure
Registration No. – 22BCE10802

Phase 1: Proposal & Idea Submission

1. Project Title:

Sentence Completion using Generative AI

2. Domain:

Generative AI | NLP | Sentence Completion

3. Problem Statement:

Text generation is a fundamental task in Natural Language Processing (NLP), enabling systems to produce coherent and contextually relevant text. This project focuses on generating a single, grammatically correct, and contextually appropriate sentence completion based on a user-provided input sentence. The model will address challenges such as minimizing repetitive phrases, maintaining coherence, and producing logically complete sentences.

4. Proposed Solution:

This project implements a sentence completion model using a pre-trained GPT-2 model. The solution is structured as follows:

- Accepts a user-provided sentence fragment as input.
- Generates a single, concise sentence as the continuation of the input.
- Controls the randomness of the output using temperature settings.
- Mitigates repetitive content using a repetition penalty.
- Provides a user-friendly interface using **ipywidgets** to control parameters such as temperature and repetition penalty.

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5. Objectives:

- Implement a single-sentence completion system using a pre-trained GPT-2 model.
- Integrate **ipywidgets** for interactive input, parameter adjustment, and output display.
- Minimize repetitive outputs using repetition penalty settings.
- Ensure sentence completions are grammatically coherent and contextually relevant.

6. Expected Outcome:

- A functional notebook that generates a single, complete sentence based on user input.
- A user interface with adjustable parameters for temperature and repetition penalty.
- Evaluation of output quality based on coherence, grammaticality, and logical consistency.

7. Tools & Technologies to be Used:

- **Python** (Primary programming language)
- **Transformers library** (HuggingFace)
- **GPT-2 Model** (Pre-trained)
- **ipywidgets** (Interactive interface)
- **Google Colab** (Execution and testing)

8. References:

- https://www.ibm.com/think/topics/transformer-model#:~:text=Transformer%20models%20such%20as%20relational,a%20series%20of%20matrix%20multiplications.
- https://huggingface.co/openai-community/gpt2
- IPyWidgets Documentation