College Name: VIT Bhopal

Student Name: Karthik Pandey (21MIM10068)

**GEN AI PROJECT PHASE 3 SUBMISSION DOCUMENT**

**Phase 3: Final Report and Submission**

**1. Project Title:**

Text Style Transfer using Generative AI

**2. Summary of Work Done**

**Phase 1 – Proposal and Idea Submission (10 Marks):**

In this phase, we identified the problem of text style transfer—transforming text from one style (e.g., casual, passive) to another (e.g., formal, active)—using Generative AI. The objective was to build a model that preserves meaning while altering style. We proposed:  
- Using transformer-based models (T5, GPT) for style transformation.  
- Designing a simple interface for input/output testing.  
- Experimenting with prompt engineering and model capabilities.

**Phase 2 – Execution and Demonstration (15 Marks):**

During execution:  
- Implemented the solution using Python, HuggingFace Transformers, and Streamlit.  
- Loaded a pre-trained T5 model to perform tasks like formalization, paraphrasing, and passive-to-active conversion.  
- Created a Streamlit UI that accepts input text and style type and outputs the transformed sentence.  
- Documented example outputs and tested for various tasks.

**3. GitHub Repository Link**

🔗 GitHub Repository – Text Style Transfer using Generative AI  
(Replace with actual GitHub link)

**4. Testing Phase**

**4.1 Testing Strategy**

We tested the application across various user inputs to ensure consistency and stylistic correctness. The goals were:  
- Handle multiple text styles (casual → formal, passive → active).  
- Maintain semantic fidelity.  
- Ensure UI interactivity and usability.

**4.2 Types of Testing Conducted**

Unit Testing  
Each function (e.g., text generation, prompt formatting) was tested individually.  
  
Integration Testing  
Ensured that model inference and UI components worked together.  
  
User Testing  
Gathered feedback from peers who tested different input styles.  
  
Performance Testing  
Evaluated response time with short and long inputs.

**4.3 Results**

Accuracy: The system generated coherent and contextually appropriate style transformations.  
  
Response Time: Most transformations completed within 1–2 seconds.  
  
Edge Cases: Nonsensical inputs produced humorous or approximate paraphrases, showing model generality but also highlighting limitations.

**5. Future Work**

While the project successfully implements style transfer using Generative AI, future enhancements include:  
  
Model Fine-tuning  
Fine-tune T5 on domain-specific style datasets.  
  
Additional Styles  
Support for tones like sarcastic, poetic, or academic.  
  
User Feedback Loop  
Allow users to rate outputs to improve results iteratively.  
  
Multi-language Support  
Extend to Hindi, Spanish, etc., using multilingual models.  
  
Mobile App Integration  
Package as a lightweight app for real-time writing assistance.

**6. Conclusion**

This project demonstrated how pre-trained generative models like T5 can perform meaningful style transformations. It illustrated the practical application of prompt-based NLP in tasks such as writing assistance, formal email drafting, or converting passive voice content into active tone. The three-phase journey emphasized the evolution from ideation to deployment and real-world testing.