AI Dungeon Story Generator – Project Report

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1. Introduction
The *AI Dungeon Story Generator* is an AI-powered creative writing application that allows users to generate imaginative and contextually rich stories based on simple textual prompts. Inspired by text-based role-playing games and AI storytelling tools, this project demonstrates how large language models like GPT-2 can dynamically generate interactive narratives. This system aims to assist writers, storytellers, and creative enthusiasts in crafting fantasy, adventure, and science fiction tales with minimal effort.

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2. Abstract
The project showcases a real-time, user-interactive storytelling application developed using the GPT-2 model from Hugging Face. Users provide a short prompt, and the system generates multiple engaging story samples, each with coherent plots and imaginative language. The entire solution runs through a streamlined web interface using Streamlit, making it accessible and easy to use. It highlights the creative potential of Natural Language Processing (NLP) in the field of entertainment and digital writing tools.

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3. Tools Used

- **Programming Language:** Python
- **AI Model:** GPT-2 (from Hugging Face Transformers)
- **Libraries & APIs:**
  - `transformers` (text generation)
  - `torch` (model backend)
  - `streamlit` (UI/UX framework)
  - `pickle`, `json`, `os` (utilities)
- **Interface:** Streamlit Web App
- **Version Control:** GitHub

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4. Steps Involved in Building the Project

Step 1: Environment Setup

- Installed necessary dependencies like `transformers`, `torch`, and `streamlit` using pip.
- Structured the project directory with separate modules for model loading, generation, and the Streamlit app.

Step 2: Model Download & Integration

- Loaded the GPT-2 base model and tokenizer using Hugging Face Transformers.
- Saved the model locally to avoid re-downloading and improve performance.

Step 3: Text Generation Logic

- Developed `generator.py` to generate multiple story samples using the same prompt.
- Configured parameters like `temperature`, `max_length`, `top_k`, and `top_p` to balance randomness and relevance in stories.

Step 4: Streamlit User Interface

- Created a clean and intuitive UI that accepts user prompts, displays generated stories, and includes options to download them as `.txt`.
- Integrated session states and dynamic story slots to allow multiple samples.

Step 5: Testing & Finalization

- Ensured that stories generated were long, unique, and grammatically consistent.
- Handled edge cases like empty input and model load errors.
- Uploaded the project to GitHub for submission and future deployment.

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5. Conclusion

This project effectively demonstrates how AI can revolutionize creative writing through NLP and deep learning models. The AI Dungeon Story Generator not only supports storytelling but also serves as a tool for brainstorming, education, and entertainment. Future enhancements can include genre classification, user story continuation, sentiment tuning, and character development. With such improvements, the application can be transformed into a powerful AI writing assistant suitable for writers, educators, and content creators.