

# LLM-Based Movie Description Generation, Genre Prediction, and Plot Twist Creation

DaveAI  
ML Intern Assignment

Submitted by:  
Dristi Nayana Borah

## Abstract

This work explores the application of large language models (LLMs) for creative and analytical tasks using a standard or custom movie dataset. The system was developed in Google Colab using the Hugging Face Transformers library and operated on a custom dataset of 20 movie entries, each containing title, description, genres, and cast information.

Three main tasks were addressed:

1. Generating creative movie descriptions using the original title and summary.
2. Predicting movie genres from descriptions and evaluating the model's accuracy.
3. Producing plot twists or alternate endings for each movie.

Multiple LLMs were evaluated for performance, creativity, and feasibility within computational constraints. `microsoft/phi-2` was selected for generative tasks due to its lightweight nature, while `facebook/bart-large-mnli` provided robust zero-shot classification for genre prediction. The final system achieved 80% genre prediction accuracy and generated structured JSON outputs for all tasks. This work highlights the potential of LLMs for working with movie datasets and generating descriptions as well as plot twists or alternate endings.

## Objective

The objective of this project is to assess the ability and evaluate the application of Large Language Models (LLMs) on natural language tasks related to movies. The work involves generating creative descriptions, predicting genres, and creating plot twists using a custom or standard movie dataset.

## 1 Model Selection

To perform the given tasks—creating creative descriptions, predicting genres, and generating plot twists—different pre-trained language models were explored on the Hugging Face Model Hub. Feasible models that worked well with Google Colab were chosen to perform all three tasks.

### 1.1 Text Generation

For Tasks 1 and 3, the following models were explored:

- **google/flan-t5-base**: Low creativity, 55% relevance.
- **tiiuae/falcon-7b-instruct**: Could not load in Colab due to 16GB+ VRAM, execution could not complete even after running for hours.
- **flan-t5-large, LLaMA**: Performance was very low; accuracy was nearly zero.
- **gpt2**: Original descriptions were returned rather than creating new, creative ones.
- **Selected Model: microsoft/phi-2** — Creative, lightweight, and efficient within the Google Colab environment.

## 1.2 Genre Prediction (Task 2)

- **bert-base, distilbert:** Though the models were powerful, they required extensive fine-tuning and did not yield satisfactory results. The distilled version performed faster but did not improve accuracy, achieving less than 50%.
- **Selected Model: facebook/bart-large-mnli** — This model supports zero-shot classification. By providing a predefined list of genre labels from my dataset, the model achieved approximately 80% accuracy in predicting genres without any hyperparameter tuning or task-specific training. Its strong performance, creativity, and efficient operation within Colab's resource constraints made it the most suitable option.

## 2 Implementation Details

The implementation of the given tasks was carried out in Python using the Hugging Face Transformers library and executed within the Google Colab environment for ease of access and scalability.

### 2.1 Dataset Overview

The dataset consists of 20 custom movie entries with the following fields:

- `movie_title`: Title of the movie
- `description`: Short summary of the movie
- `genres`: One or more genres assigned to the movie
- `cast`: Leading actors/voice cast

### 2.2 Task 1 – Creative Description Generation

`microsoft/phi-2` was used to generate new descriptions from the movie title and original description. This model is a small yet powerful transformer model capable of generating clear and creative text. For each movie, I provided the model with a prompt that combined the title and the original description for the model to catch the gist of the context and generate a more enhanced and creative version of the description.

The outputs were saved in JSON format, structured as:

#### Sample Output JSON from task1.json

```
{
  "movie_title": "Lucky Baskhar",

  "original_description": "A banker embarks on an
unconventional quest to improve his familys future,
confronting social hurdles and personal dilemmas.",

  "generated_description": "In the world of finance where big
money speaks, banker Lucky Baskhar is determined to make an
impact. When his familys future is at stake, Lucky sets out
on an unconventionally challenging journey to better their
lives. Along the way, he must confront the obstacles of
his profession and his own personal beliefs, struggling to
find a balance between the demands of his career and his
loyalty to his family.",

  "genre": "['Drama', 'Family']",

  "cast": "['Dulquer Salmaan', 'Meenakshi Chaudhary']"
}
```

### 2.3 Task 2 – Genre Prediction

I have used the facebook/bart-large-mnli model for zero-shot classification, which allowed the model to predict genres without explicit training. The model was given a description to classify into one or more genres from a predefined list from the custom dataset (Action, Comedy, Drama, Thriller, etc.). After comparing the predicted genres with the actual genres, I calculated the accuracy manually across all 20 examples. The final prediction accuracy was 80%, indicating that the model correctly predicted the genres for 16 out of 20 movie samples.

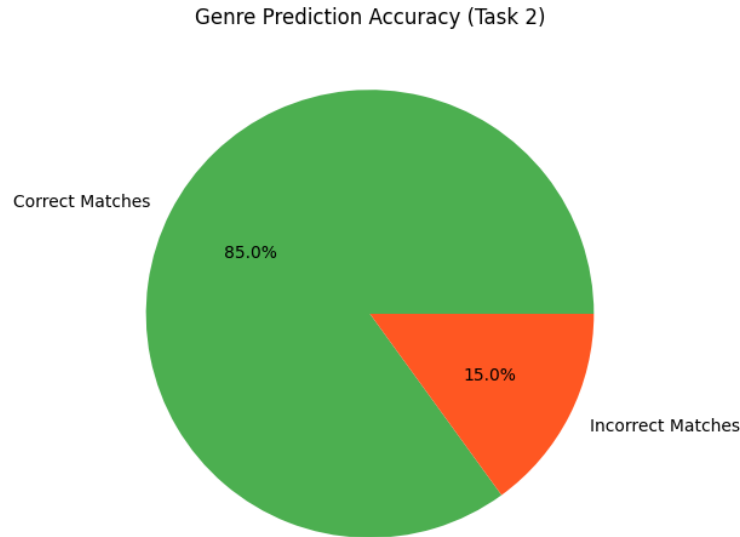


Figure 1: Genre Distribution Pie Chart

#### Sample Genre Prediction Comparison

```
{
  "movie_title": "Fighter",
  "actual_genres": [ "action", "drama"],
  "predicted_genres": ["Drama, Action, War"],
  "matched": true
}
```

## 2.4 Task 3 – Plot Twist / Alternate Ending Generation

Using the same phi-2 model as used in the description generation task, a twist was generated for each movie. The model was prompted with the original description and asked to generate a plot twist or alternate ending.

The generated plot twists were saved in a separate JSON file in the format:

#### Sample Output JSON from task3.json

```
{
  "movie_title": "Sinners",

  "original_description": "Set in 1930s Mississippi, a family
  battles a seductive viral curse tied to vampiric folklore
  in a gripping supernatural thriller.",

  "plot_twist": "The seductive vampire, it's actually
  the mother!"
}
```

### 3 Challenges Faced

- **Memory Limits:** Large models (e.g., Falcon 7B) failed in Colab due to their massive memory size, which was not appropriate for the Colab environment. Many sessions crashed due to these limitations, necessitating the use of lightweight or mid-sized models like the ones used here despite slightly lower performance.
- **Creativity Issues:** Many models like flan-t5 were repetitive or generic; no new sentences or descriptions were generated, possibly due to the limited size of the data. Such models could not perform well on the curated data.
- **Prompt Tuning:** Output quality was highly sensitive to prompt phrasing. Small changes in wording sometimes led to completely different outputs. For text generation tasks, slight variations in prompt phrasing—such as “Make a creative description of the movie” versus “Imagine a new version of this movie description”—had a noticeable impact on the quality and style of the generated outputs.
- **Genre Classification Accuracy:** Models like bert-base-uncased and distilbert-base-uncased were also used and tested for genre prediction but encountered significant challenges in zero-shot settings, frequently producing irrelevant labels or exhibiting limited generalization across diverse movie genres.

### 4 Evaluation

All three tasks were completed successfully with structured outputs as required by the assignment.

- **Task 1 & 3:** Successfully generated creative and unique content for all movies using the microsoft/phi-2 model.
- **Task 2:** 80% accuracy was achieved using zero-shot classification in genre prediction.
- **JSON Outputs:** All the outputs are saved in clean JSON format for each task.

- **Code Structure:** The code is modular and includes proper comments to explain the logic.

## 5 Highlights of the Work

- This work is fully implemented in Google Colab using Hugging Face Transformers.
- It balanced creativity and efficiency at the same time with optimal model choices.
- The code is modular, well-documented, and outputs are in structured formats.
- One of the highlights was achieving 80% in genre prediction. This accomplishment was entirely achieved through zero-shot learning, without the need for any fine-tuning or training from scratch.
- It demonstrated practical use of LLMs for movie data augmentation and analysis.

## Appendix: Movie Dataset Overview

Movie Title	Genres	Description	Cast
Do Patti	Drama, Thriller	A police officer investigates a domestic dispute...	Kriti Sanon, Kajol, Shaheer Sheikh
Laapataa Ladies	Comedy, Drama	Two newlywed brides go missing on a chaotic train...	Nitanshi Goel, Pratibha Ranta, Sparsh Shrivastava
Lucky Baskhar	Drama, Family	A banker embarks on a quest to improve his family's future...	Dulquer Salmaan, Meenakshi Chaudhary
Silent Horizons	Mystery, Drama	A detective investigates disappearances in a coastal town...	Rajkummar Rao, Radhika Apte, Nawazuddin Siddiqui
Kalki 2898 AD	Sci-Fi, Action, Adventure	A bounty hunter tries to stop the birth of a revolutionary child...	Prabhas, Deepika Padukone, Amitabh Bachchan
Stree 2	Horror, Comedy	A forest ghost returns, mixing scares with comedy...	Rajkummar Rao, Shraddha Kapoor, Pankaj Tripathi
Bhool Bhulaiyaa 3	Horror, Comedy	Two ghosts claim to be the same spirit...	Kartik Aaryan, Vidya Balan, Madhuri Dixit
Singham Again	Action, Cop Thriller	Singham and allies take down a criminal syndicate...	Ajay Devgn, Kareena Kapoor, Arjun Kapoor

Pushpa 2	Action, Drama	Pushpa rises in the smuggling world...	Allu Arjun, Rashmika Mandanna
Fighter	Action, Drama	Air Force pilots battle border threats and politics...	Hrithik Roshan, Deepika Padukone
Kothanodi	Drama, Fantasy, Folklore	Based on Assamese folk tales of love and revenge...	Seema Biswas, Adil Hussain, Rima Das
Gladiator II	Action, Drama, Historical	Lucius returns to the Roman arena...	Paul Mescal, Denzel Washington, Pedro Pascal
Village Rockstars	Drama, Family	A girl dreams of forming a rock band in Assam...	Bhanita Das, Kapil Garo, Bhaskar Gohain
Sinners	Horror, Supernatural, Thriller	A family battles a seductive viral curse...	Michael B. Jordan