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# FINE-TUNING A LARGE LANGUAGE MODEL FOR STORY GENERATION

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# Abstract

For TV, movies, books, plays and all other narrative based creative works, one fundamental requirement is a strong storyline. With the digital age and the internet, the rate of consumption of this content has risen significantly. Writers may not be able to keep up with the high demand due both to tight deadlines on works as well as personal issues like writer's block and lack of inspiration.

When investigating solutions for this problem, large language models provide a unique solution. Since the introduction of the Transformer architecture, natural language processing and related tasks have been skyrocketed to new spheres of possibility and application. Built on this transformer architecture, large language models have been achieving ever promising results in a multitude of tasks. This includes text-generation, classification, question and answers etc. Story-writing at its core is a manual text-generation task where the entire storyline and elements are to be handled and controlled by the writer.

Therefore, by exploring existing text generation methodologies and story-generation methodologies using LLMs, this exploration resulted in a software artefact that allows the generation of unique stories. Here, the pretrained LLM GPT-2 from OpenAI was taken as the based model for the task. This was because of its history of being extensively trained on text data (which included an extensive story library) and its decent performance at text-generation tasks once fine-tuned. Moreover, GPT-2 is a model that is sufficiently small enough that it is able to run on minimal hardware. This allows for one of the main objectives of this endeavour in making an affordable solution for story generation.

Upon fine-tuning the model on a given set of stories, the model was made to generate stories. The results of this exploration showed that GPT-2 performs very well in its generations once trained on an appropriate set of stories. Additionally, the fine-tuned model exhibited exceptional skill in amalgamating multiple author styles and elements in its story generations. Essentially, using the methodology described, the user is able to fine-tune this model with any source material they decide and have the model generate interesting stories based on those training data. Given the fact that the methodology can be run for essentially no cost to the user, it allows high accessibility and usability of the artefact.

Finally, comparisons were done with 4 other models. From these, the best performing model was OpenAI's Chat GPT 4 model with its advanced generational capabilities. However, to use GPT-4 there is a monetary charge per month, whereas this methodology is free. While the other models compared generated very decent storylines (GPT 3.5 being the best), none of them are able to amalgamate multiple authors in their generations.

- Artefact and development folder link:

[https://drive.google.com/drive/folders/1PJqhgSUEFMMxW\\_4jBfUpcUz3ZBgHIzer?usp=sharing](https://drive.google.com/drive/folders/1PJqhgSUEFMMxW_4jBfUpcUz3ZBgHIzer?usp=sharing)

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## Introduction

While there are a multitude of “successful” stories, for every single story of success there are perhaps a thousand or ten-thousand failed stories (Gottschall, 2012). In a similar vein, for every completed story, there may be a multitude of stories that remain incomplete (Becker, 2008). While many nuances exist for the failures of these stories, this exploration focuses on solving the issues related to inspiration in story writing. On-demand streaming services, online content sharing, digital media, e-books are all major types of story consumption mediums that have exponentially increased the consumption rate of content (Lobato, 2019). With the velocity of stories consumed continuously, it is only natural that the demand for their creation is at an all-time high (Thompson, 2018). Therefore, writers are in constant need of inspiration and original ideologies that they can emulate in their stories.

With the advent of the Transformer architecture and with it the Large Language Model (LLM) for Natural Language Processing, innovative new methodologies have developed for content creation (Vaswani *et al.*, 2017). Multitudes of LLMs have shown highly promising results in text-generation in various contexts of which story generation has been explored extensively as well (Fan, Lewis and Dauphin, 2018). Therefore, this exploration aims to deliver a software methodology which uses the power of LLMs to generate unique stories. This will allow writers of all levels to be able to automatically create unique stories by amalgamating the works of any author/authors they choose. Additionally, this exploration will focus on creating a methodology that allows convenient and economically efficient access to this resource.

## Rationale

In storytelling specifically, episodes in a TV-series, movies, books etc. have to be engaging where consumers will continually follow/watch the stories which in turn generates revenue for the organizations that host or own the content (however not necessarily involved with its creation) (Hye-Knudsen, 2022). However, generating unique or engaging stories continually falls on to a set of experts/writers (or content creators) who need to either draw from their imagination or utilize existing content for inspiration (Conor, 2014). This process while profitable, consumes a significant amount of time (Jordan, 2020). With the rise of the digital age (and online streaming platforms), the velocity with which stories are consumed and hence produced has increased significantly (Anghelcev *et al.*, 2021). On top of the pressures and push to meet tight deadlines for the creation of stories, writers have to manage their own issues in writing stories such as lack of inspiration and writers block (Flaherty, 2004).

Logically, an automated storytelling software tool that generates unique stories would alleviate some of these issues and allow the writers to work more efficiently. Additionally, a solution that is affordable and accessible will allow writers who maybe beginning their writing journey with little resources to focus on the creative aspect rather than about the economical weight.

With the advent of the Transformer neural network architecture (Vaswani *et al.*, 2017) and it's LLM implementation, natural language processing has reached a high level of practicality and applicability in textual applications (Young *et al.*, 2018). In textual applications, text-generation is a prime area of research and development (See, Liu and Manning, 2017) and a possible application of text-generation would be story generation or story writing (Fan, Lewis and Dauphin, 2018). Hence, the creation of a tool that is able to automatically generate stories for usage by writers for their own works may partially address their issues or blocks with story writing. Additionally, it allows the further research and development into how LLMs behave in open-ended generation of text.

## Aim and Scope

Hence, the aim of this endeavour is to create a story generation LLM that can generate stories given an initial prompt or text input. The LLM will be developed using pretrained LLM machine learning models and trained using story data that maybe scraped from existing content. One feature that I envision implementing is the ability to fine-tune or train the model on minimal hardware in order to make the methodology as accessible and as economically feasible as possible. Since stories span a plethora of genres, this endeavour will specifically focus on science-fiction stories. However, the methodology will be developed such that it is applicable to all genres. Additionally, to abide by copyright laws that govern intellectual property (O'Hare, 2005), the training data for these models will be obtained only using copyright free or open-source content.

# Objectives

The objectives of this exploration and software artefact are as follows:

1. Research existing LLM story generation methodologies and their features to understand how story generation functions and how a model maybe fine-tuned.
2. Fine-tune a LLM to generate unique storylines based on an initial input prompt text.
3. Have the LLM mimic the style and elements of the authors it was trained on.
4. Make the fine-tuning process an accessible and economic process using minimal hardware.

## Novelty and Innovation

With the recent rise of Large Language Models and their ever-improving capabilities in textual applications, the story generation capabilities of these models have not been fully explored and multitudes of issues remain yet to be addressed (See, Liu and Manning, 2017). More significantly, a tool that allows writers to expand their imagination and inspiration in story writing may give rise to man-kinds greatest literary works yet. Additionally, the focus on accessibility and economic feasibility of running this application allows may result in broad usage of this methodology. This exploration may also contribute to the ever-growing works into understanding how LLMs work and improving their performance for specific tasks.

While programs like Chat GPT already exist with some of this functionality built-in, these existing programs are not tailored nor trained towards story generation specifically and hence maybe lacking in their generated content (Brown *et al.*, 2020). Additionally, the concept and building blocks of this program may be used to advance capabilities in other fields such as music composition, product design concepts and food recipe generation etc.

With the high technical barrier of machine-learning and related disciplines (Goodfellow, Bengio and Courville, 2016), the innovations proposed here and its high accessibility to most users, may allow some of the non-technical audience to witness the operation of LLMs. Which in essence may be able to bridge a part of the technical knowledge gap.

## Structure of the Report

The structure of the report will be as follows:

1. Introduction: Brief introduction of the project including some history of story writing and LLMs along with reason for exploration of the solution.
2. Rationale, scope and objectives: Detailed description for the reason and motivation behind this exploration. This included a set of Objectives that were to be achieved upon completion of this exploration.
3. Novelty and Innovation: Describes how novel the chosen project is and what innovations may be present in the exploration.
4. Literature Review: A detailed and deep review of NLP, Transformers and LLMs. Possible methodologies that exist for the chosen exploration are detailed. In addition, existing works done on story writing and existing literature on the field is explored in detail.

5. Design and Approach: The detailed methodology on fine-tuning the GPT-2 model is explained. This includes the tools used and the settings and variables that are used for the process.
6. Implementation: The capability of the fine-tuned model is explored here. How the model performs for the target tasks is reviewed. Finally, the Objectives stated in the Rationale section are verified as being achieved.
7. Ethical Consideration and Approach: States the ethical considerations made for the project.
8. Evaluation and Reflection: Details the evaluation of the artefact performance against similar solutions. Describes problems faced during the process and possible solutions implemented. Concludes the investigation.

## Literature Review

In the literature review, broad research into how Large Language Models work and how they can be customized (Fine-tuned) for our target task is explored. Once a brief overview of the theory behind LLMs is completed, the review focuses on existing solutions and research on story generation using LLMs. This will include any tools or software that can accomplish this task. Finally, the review will conclude with an overview of the existing solutions and a brief description of the artefact to be developed to address the objectives mentioned in the rationale.

### Large Language Models

The main aim of this endeavour is to create a tool using a LLM that will aid the user (writer) in creating unique and engaging stories. Within the industry, text-generation tools and software already exist with multiple functionalities. However, this endeavour focuses on generating stories using or customizing a large language model. Hence, to understand how LLMs can work, it is beneficial to explore how Large Language Models developed from the traditional NLP process. Therefore, one main goal of this literature review is to answer the following research questions:

1. The concept of Natural Language Processing (NLP) in machine learning.
2. What are transformers?
3. What are Large Language Models?
4. How can Large Language Models be used to generate stories?

### Natural Language Processing

When exploring the fundamentals of text generation applications, NLP stands as one of the most significant concepts (Jurafsky and Martin, 2023). According to Hirschberg and Manning (2015), this process takes an input in natural language (or normal English) and converts the input such that its meaning can be understood by software for processing (Hirschberg and Manning, 2015). The processing here may represent any number of use cases such as: textual data analysis, text classification, text-generation and prediction or completion. For details see Appendix E.

## Transformers

The next evolution or upgrade of this NLP “pipeline” came in the form of Transformers (Vaswani *et al.*, 2017). Researchers at Google in their landmark “Attention is Everything” research paper, developed a novel way of processing text (originally developed for translation tasks) such that the word order, meaning and importance (“attention”) of text is not lost compared to how it would be lost if each word is translated separately.

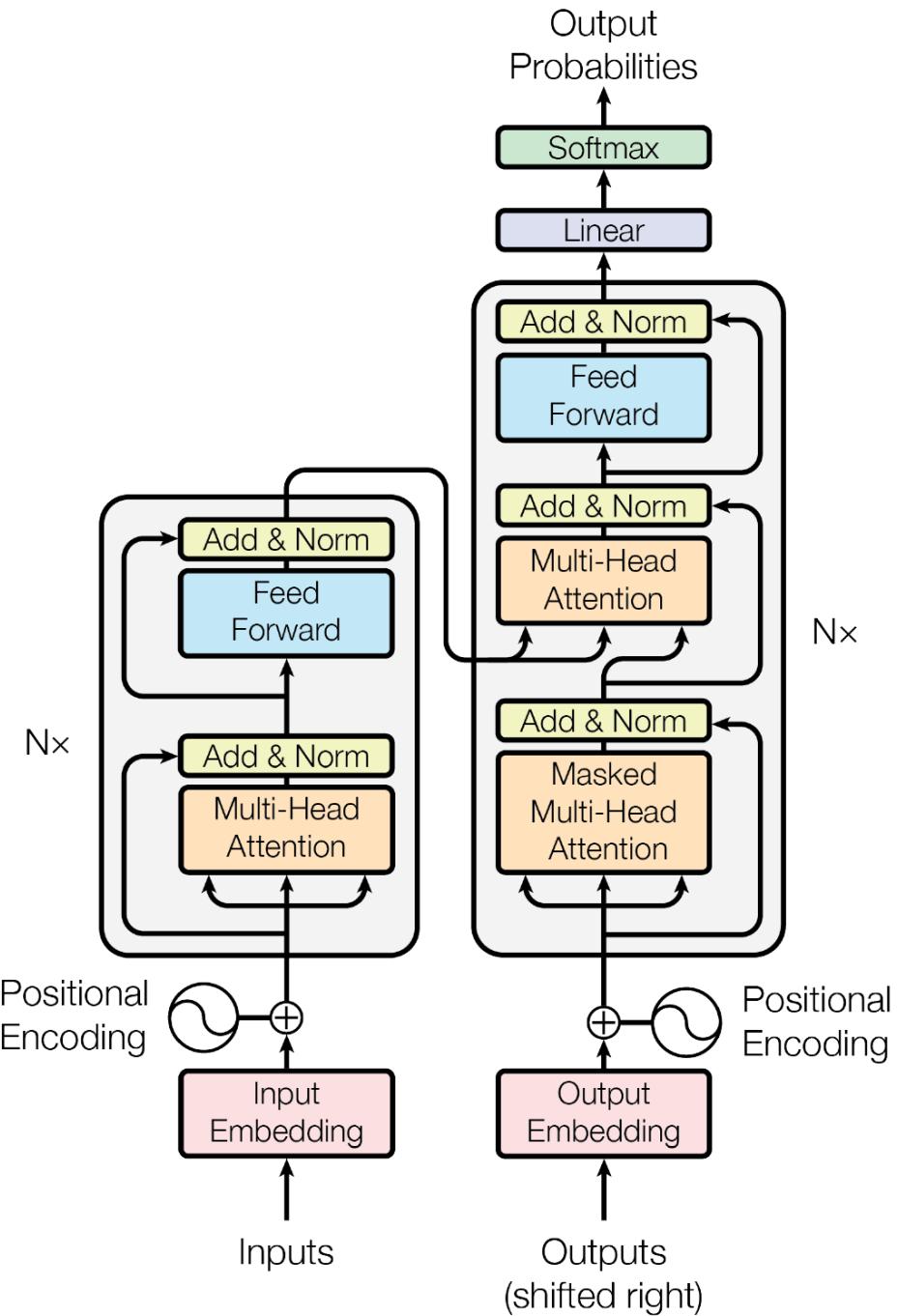


Figure 1 The Transformer Architecture (Vaswani *et al.*, 2017)

Transformers are a type of neural network architecture that use deep learning techniques with multiple hidden layers to optimize and increase their performance as compared with other conventional models

(Goodfellow, Bengio and Courville, 2016). They are machine learning models that can “transform” from one text sequence to another (Alammar, 2018). These consist of two parts: an encoder and a decoder. The encoder will work on the input sequence and the decoder operates on the target output sequence. Just like the tokenization step in the NLP pipeline, the transformer works on numbered representations of words (Sutskever, Vinyals and Le, 2014). Please refer Appendix E for more on Transformers.

## Large Language Models

With this innovation, one of the most significant developments that work on top of this transformer model are Large Language Models (LLMs) (Brown *et al.*, 2020). They are large models with significantly large number of parameters (or hyper-parameters), often in the range of millions or billions of parameters (Kaplan *et al.*, 2020). These parameters are the weights and biases (sets of numbers) at each node in the neural network that transform the given input to the target output. They are “learned” by the model when it is trained on the required data (Goodfellow, Bengio and Courville, 2016). However, LLMs are general-purpose models that are not customized for a specific task. Therefore, they need to be trained and fine-tuned to the required task. Please see Appendix E for more.

These LLMs are ideal for the purposes of this investigation since:

- A single LLM can execute a number of tasks which include Text-Generation which is the main area of interest in generating stories (Brown *et al.*, 2020).
- Theoretically, it can be fine-tuned to generate content based off a custom collection of text (i.e. a collection of book texts). This data can be minimalistic since most of the heavy lifting has been done in pre-training (Raffel *et al.*, 2020). This means that the model can be used in few-shot (i.e. model is trained on minimal data and generates output) or single-shot (i.e. the model generates without having to be explicitly trained on that data) generation (Brown *et al.*, 2020).
- The performance of the model will only grow the more text data is added in its training.

## Conclusion

With the above exploration, it is clear how the NLP pipeline has been developed to the modern Large Language Models and their unique operation. Moreover, the functionalities of LLMs make them an ideal candidate for the story generation task at hand. Unlike previous machine-learning software used for intelligent text-generation which consumed or required vast computing resources, the modern implementation and operation of LLMs allow it to be customized for this use-case far more efficiently (Radford *et al.*, 2019).

To answer the final research question on how a LLM can be used for text generation in terms of story writing, there are several methods that can be explored:

1. Using a pre-existing pretrained model for story generation (Fan, Lewis and Dauphin, 2018).
2. Using a pretrained model and fine-tuning the model on story data (Howard and Ruder, 2018).
3. Using an updated product available for purchase (such as GPT 4) (Brown *et al.*, 2020).

## Story Generation Using Large Language Models

Using LLMs, there are many methods of content generation (story generation) (Brown *et al.*, 2020). However, for this exploration, the focus will be on three main methodologies:

1. Pretrained Model – Where a trained model is used as-is for the task at hand. Once an appropriate model is selected (depending on the task), story/text outputs can be obtained. However, they may lack specificity since it is generating from its training data which is usually too broad (Radford *et al.*, 2019).
2. Fine-Tuned Model – This is where the said pre-trained model maybe trained (fine-tuned) with data or sequences similar to those required as output. These tend to produce outputs very close to the intended target output (Howard and Ruder, 2018).
3. Paid LLM Model – This is where a fine-tuned LLM that is maintained by a third party can be used for the generation. Since the user pays for the service, the company hosting the LLM provides a wide range of features and usability in the provided LLM. These models are constantly updated and upgraded to cater to multiple use-cases. A prime example is Open AI's Chat GPT 4 model (OpenAI, 2023).

While these may not be the only three methods for this purpose, they can be considered the most popular methods of automated content creation. Additionally, all three of these methods are easily accessible and usable with minimal technical skill (Raffel *et al.*, 2020). Please refer to Appendix E for detailed explanations of these LLM methods.

## Existing Research on Story Generation with LLMs

This section details some of the most relevant and recent research done on story/content generation using Large Language Models. Please refer to Appendix E for review of more research done.

### *The Next Chapter: A Study of Large Language Models in Storytelling*

In this paper, Xie et al. (2023) evaluates the storytelling capabilities of large language models (LLMs). The paper compares GPT-3 with various state-of-the-art story generation models (Xie, Cohn and Lau, 2023). These include knowledge-enhanced based models like KGGPT-2 and HINT, a storyline planning based model called PROGEN and MTCL, which combines storyline planning and commonsense reasoning. Additionally, it includes BART, a baseline model fine-tuned on story datasets. The comparison is done across various datasets and using different evaluation metrics to assess the story quality and coherence. Here, both automatic and human evaluations are used to assess story quality and GPT-3 shows superior performance in story generation compared to the other models. The suggestion is that GPT-3 can compete with human authors in story quality. However, the study raises concerns about GPT-3's tendency to replicate existing stories. Additionally, the effectiveness of prompt-based learning for improving LLMs' performance is explored.

## *MEGATRON-CNTRL: Controllable Story Generation with External Knowledge Using Large-Scale Language Models*

The paper primarily focuses on enhancing the controllability in story generation through a framework that integrates external knowledge with large-scale language models (Xu *et al.*, 2020). This framework, MEGATRON-CNTRL, includes a keyword predictor, knowledge retriever, contextual knowledge ranker, and a conditional text generator. It shows improved fluency, consistency, and coherence in story generation compared to prior models on the ROC story dataset. By using different keywords and by scaling the model from 124 million to 8.3 billion parameters, the controllability and higher quality generation of the framework is shown. Additionally, it allows dynamic incorporation of knowledge, improving the relevance of generated content.

For the base of this framework, the pre-trained Megatron-LM models for BERT and GPT-2 are used. This Model is compared against state-of-the-art story generation models including Plan and Write, and Knowledge Enhanced GPT-2.

## *Towards Coherent and Consistent Use of Entities in Narrative Generation*

Here, narrative generation in terms of entity coherence and consistency is explored (Papalampidi, Cao and Kočiský, 2022). LMs often fail to maintain coherence, especially in complex stories with multiple entities. The study proposes augmenting a pre-trained LM with a dynamic entity memory for narrative generation and introduces a novel metric to measure long-range entity coherence. An auxiliary entity-related loss guides the reads and writes to the entity memory. With these implementations, models show increased entity coherence according to both automatic and human evaluations.

The research highlights the struggle of LMs in maintaining protagonists and consistent entities throughout a story. It demonstrates the importance of entity coherence in the perceived quality of narrative generation.

## *Collaborative Storytelling with Large-scale Neural Language Models*

Collaborative storytelling, where humans and AI agents work together to create stories is explored (Nichols, Gao and Gomez, 2020). It focuses on improving the quality of AI-generated story continuations using large-scale neural language models like GPT-2. Here, the GPT-2 model is trained with a maximum likelihood estimation loss function and a weighted mixture of the WritingPrompts and BookCorpus datasets. This tuned generation was seen to be more preferable to the human evaluators than the non-tuned generations. This study highlighted the importance of fine-tuning a model on task specific data and how this data drastically improved the target generation.

These findings showcase advancements in AI-assisted storytelling and highlight the potential of collaborative storytelling as an interactive and creative medium.

## *Enhanced Story Comprehension for Large Language Models through Dynamic Document-Based Knowledge Graphs*

How to enhance the story comprehension abilities of large language models is explored (Andrus *et al.*, 2022). It introduces a novel architecture that augments story processing with dynamic, document-specific knowledge graphs, enabling models to retain and utilize information from longer texts. This is supremely beneficial in any LLM, considering the fact that most LLMs cannot retain long context when generating output (Devlin *et al.*, 2019).

The architecture improves the story comprehension of large language models and hence addresses the limitations of finite context windows in language models. Additionally, shows broad improvement over typical prompt formulation methods. The approach is effective without requiring any training, fine-tuning, or labelled data.

## Conclusion

From the methodologies explored above, most of the models used in these explorations were fine-tuned or a unique fine-tuning methodology was used to obtain improved generations. However, these explorations had used models that require significant hardware and technical skill to operate. For example, the MEGATRON model is scaled to utilize 8.3 billion parameters (Xu *et al.*, 2020). This would require significant compute resources to even load the model into memory. Additionally, each of these fine-tuned models discussed showed improved scores on story generation evaluations both automatic and human. Therefore, it is logically sound, and research backed to expect LLMs to perform significantly better upon fine-tuning.

In the focus of this exploration, a more practical and accessible option is required. Here, in accordance with the objectives mentioned, the artefact/methodology should be capable of being run on least resources. Therefore, the exploration will focus on a methodology that is comparatively light-weight and is able to be fine-tuned with a custom set of literary works for on-the-go generations. As mentioned in the rationale, this may provide an effective tool against writing difficulties like lack of source material or writer's block.

Therefore, for the model the pretrained GPT-2 is selected since it has a proven track record of decent generation according to extensive research done on it and as evidenced by its usage in a majority of the research detailed in the prior section. Additionally, with its less requirements on resources, and faster fine-tuning, it is ideal for this purpose (Radford *et al.*, 2019). For the dataset, the open-source Gutenberg project will be used to gain sample dataset of books to fine-tune the model on. Google Colab will be used as the environment with which to run the fine-tuning as well as model evaluation.

# Design and Approach

Having selected the GPT-2 pretrained model as the base model for fine-tuning, the methodology followed is explored in the following section.

## Methodology

### Tools and Resources Used

#### *The Google Colab Environment*

For the execution of Code and training of the model, two choices exist:

1. Online development and compute environment
2. Local Environment

To be able to run the process on-the-go and to have universal accessibility as mentioned in the objectives, an assumption can be made that the user will not have a high-performance GPU enabled device. Therefore, the choice is an online development and compute environment. The choice for this exploration is Google Colab:

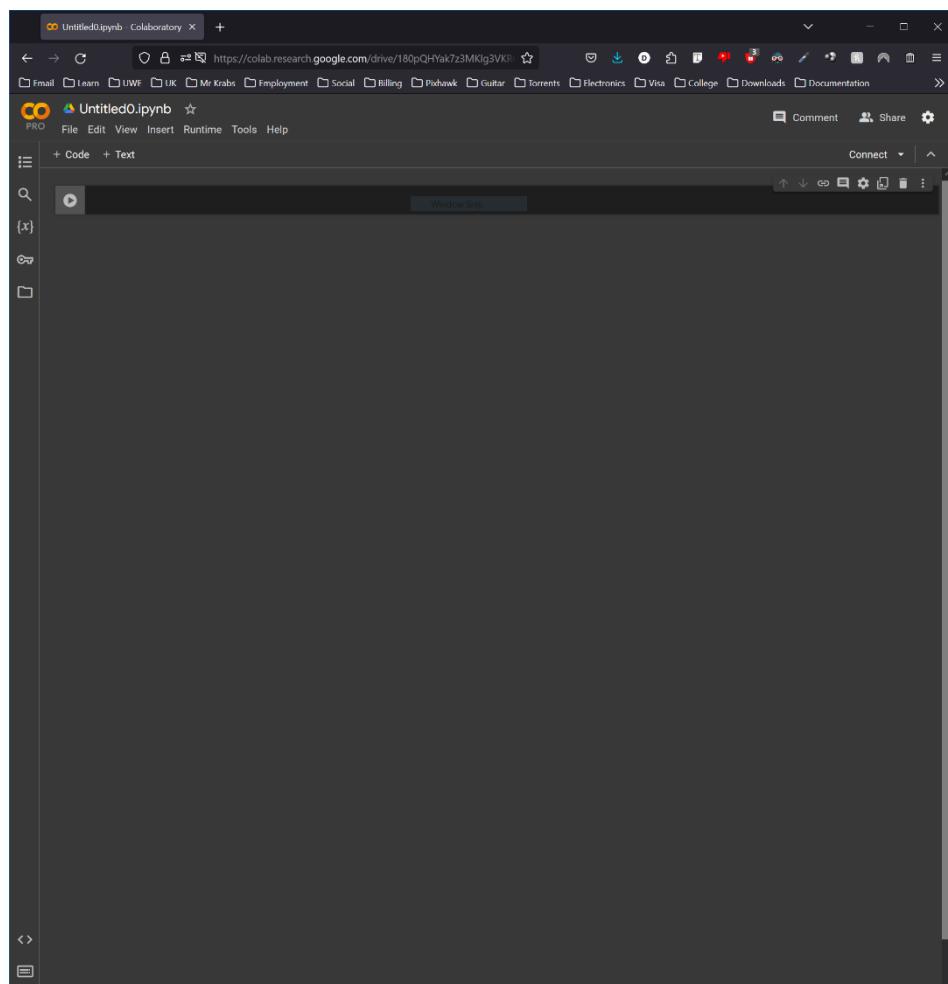


Figure 2 Google Colab Interface

With its free tier offering a T4 GPU and its paid offering starting at a very affordable 9.72 GBP a month (Google Research, 2024), it is an optimal choice compared to others. Additionally, it allows for Google drive integration that allows a fully cloud storage for both model and dataset and avoids having to upload/download them each time.

### *Hugging Face and Resources*

As mentioned in the Literature review, the best resource to obtain pretrained models for fine-tuning is the Hugging Face's model hub (Wolf *et al.*, 2020). It provides a comprehensive catalogue of pre-trained and fine-tuned models for usage in any application. Additionally, it provides a multitude of free libraries that allow convenient methodologies to load and fine-tune models such as:

1. The “Transformers” library: This contains all methodologies required to load models into memory and manipulate them including fine-tuning and inference (Wolf *et al.*, 2020).
2. The “Accelerate” library: This library works with the Transformers library to allow training models efficiently on any GPU setup. The complexities of parallelization are handled by this library.

### *The Gutenberg Library*

This open-source library provides copyright free literary works (Project Gutenberg, 2023), that can be cleaned and used for the fine-tuning.

### *The Model*

As mentioned in the literature review, the GPT-2 pretrained model (from Hugging Face) will be used. This model will be fine-tuned on the dataset obtained from the Gutenberg Library.

## The Process

### *The Model*

#### Google Colab Runtime and Environment

Here, the Colab environment needs to be initialized first for pre-trained LLMs before any model can be loaded into memory. Moreover, since most LLMs function efficiently with NVIDIA CUDA architecture processes (Rajbhandari *et al.*, 2020), the Colab computation settings need to be selected accordingly. From the compute instances available as seen in Figure 48 (Appendix C):

- If using Colab Pro or any paid version of Colab, utilize the A100 GPU instance. The A100 provides the most efficient performance in training and running the model. However, these compute instances may not be available and therefore a V100 GPU instance will be sufficient.
- If using the unpaid version of Colab, using the T4 GPU is sufficient. However, with this configuration, the execution time of any task is significantly longer. The benefit of using this configuration over even the paid GPU configurations is their high availability.

Once the runtime has started, the following cell needs to be executed to install the necessary libraries:

```
▶ # The libraries that are required to run and fine-tune the GPT 2 model  
# These libraries are provided by Hugging Face  
!pip install -U accelerate  
!pip install -U transformers
```

Figure 3 Install required libraries for model

Refer to Appendix B for details on these libraries.

Next to initialize the environment, the following built-in modules need to be imported:

```
[ ] # Here the code checks if the system has a GPU and if so the processing is set  
# to the GPU  
import torch  
  
device = torch.device(  
    "cuda" if torch.cuda.is_available() else "cpu"  
)  
print(f'Using Device: {device}')
```

Figure 4 Check for GPU and set processing to GPU

```
# Here the individual story files are accessed and combined to one text file.  
# This allows the model to be fine-tuned at once on all the data of all the  
# selected stories.  
import os  
import string  
import re  
from google.colab import files
```

Figure 5 Import modules for text manipulations

Once these modules are loaded (Refer Appendix B), the runtime is ready to load the model.

### Loading Model in Colab

When using the GPT-2 model, there are three versions of the model that can be used. Each of these versions have been split to allow users flexibility on the size of the model to be used for their application:

- GPT-2 XL: 1.5 billion parameters
- GPT-2 Large: 774 million parameters
- GPT-2 Medium: 355 million parameters
- GPT-2 small: 124 million parameters

For the target purposes and to allow testing this methodology on common hardware, the GPT-2-Medium model is loaded. This is because, while loading the GPT-2-Small model would be computationally less intensive, a better generation is possible with larger models. However, the GPT-2-Large model with its 774 million parameters, cannot be trained with a T4 GPU and would consume significant compute units and time on the A100 or V100 GPUs to both run and train.

The code to load the GPT-2-Medium model is as follows:

```
[ ] #Import the required GPT2 modules from the transformers library for running
#GPT2 model
from transformers import GPT2Tokenizer,GPT2LMHeadModel,TrainingArguments,Trainer,DataCollatorWithPadding

from torch.utils.data import Dataset

# If a local copy of the fine-tuned model is unavailable, use the following two lines to load the model and tokenizer to load it directly from Huggingface:
# tokenizer = GPT2Tokenizer.from_pretrained("gpt2-medium")
# model = GPT2LMHeadModel.from_pretrained("gpt2-medium")

tokenizer = GPT2Tokenizer.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/tokenizer")
model = GPT2LMHeadModel.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/model")

# Run the following to load the fine-tuned model on stories with original lengths
# tokenizer = GPT2Tokenizer.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/tokenizer")
# model = GPT2LMHeadModel.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/model")

# Run following two lines to load the fine tuned model trained on equivalent length stories
# tokenizer = GPT2Tokenizer.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/tokenizer")
# model = GPT2LMHeadModel.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/model")

if tokenizer.pad_token is None:
    tokenizer.pad_token = tokenizer.eos_token
    tokenizer.pad_token_id = tokenizer.eos_token_id

#Send the model to process within the GPU
model.cuda()
```

Figure 6 Loading pretrained GPT-2 model

Here both the model and tokenizer are loaded into memory to allow passing new text into the model for both generation as well as fine-tuning. Both these resources are loaded using the Hugging Face's transformers library and downloaded onto memory. However, a more efficient method would be to have the model downloaded locally onto the drive or to the runtime and have it loaded from there for faster loading when running more experiments on the pretrained model. This can be achieved by first downloading the model as shown in fig x in the Appendix B.

Additionally, a padding token is initialized here for the tokenizer as well to allow any text that is entered to the model to have consistent sequence lengths. Here it has been set to the EOS token or the End of Sentence token of the tokenizer.

Next to use the GPU attached to the runtime, the ".cuda" is run to load the model to the GPU.

## Creating prompt and generating text

Once the model and tokenizer are loaded, it is possible to prompt it with text for text completion:

```
#Set the model to evaluate to run prompts on the model for generation
model.eval()

#Set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

#Convert the prompt text to tokens and add the attention mask
input_ids = tokenizer(prompt_text, return_tensors = "pt").input_ids
attention_mask = tokenizer(
    prompt_text, return_tensors="pt"
).attention_mask

#Send converted prompt and attention mask to GPU
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

#Generate the output from the model based on the parameter set here
output = model.generate(
    input_ids = input_ids,
    attention_mask = attention_mask,
    pad_token_id = tokenizer.pad_token_id,
    max_length = 1024,
    num_beams = 10,
    min_length = 1000,
    temperature = 3.5,
    top_k = 50,
    do_sample = True,
)

generated_text = tokenizer.decode(output[0],skip_special_tokens = True)

print(generated_text)
```

Figure 7 Setting Pretrained GPT-2 to Generate Text base on prompt

First the mode is set to the evaluation mode to allow for text generation evaluation.

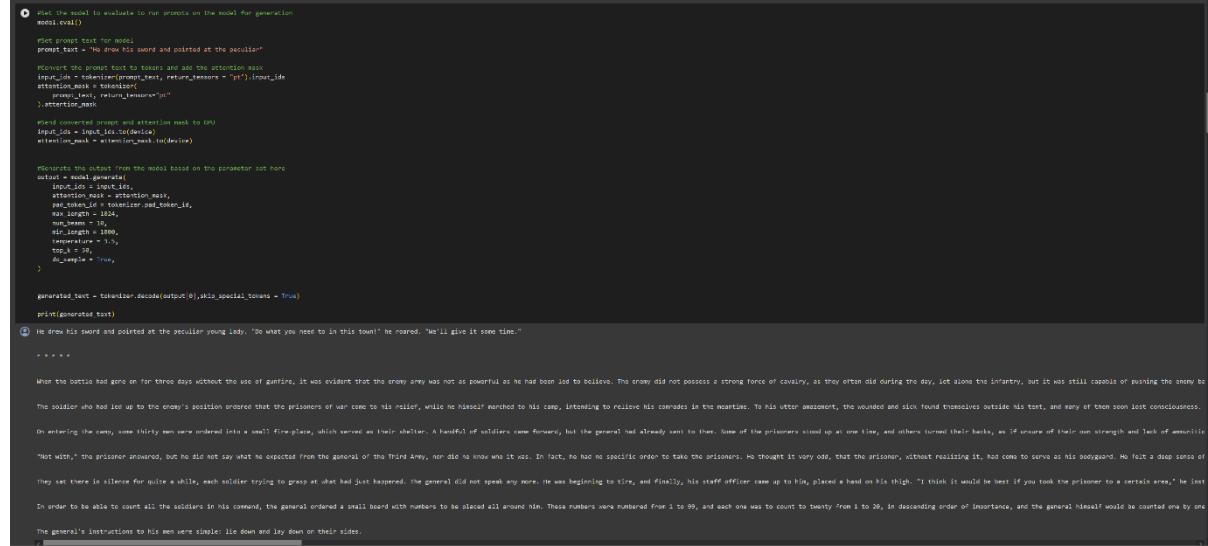
Here, the prompt text needs to be tokenized in order for the model to process it. Hence, the tokenizer is used to tokenize the input text. Additionally, to allow the model's attention layer to pay attention to each word of the prompt and to ignore the padding tokens, the attention mask is used, and each word of the prompt is provided with this mask.

Once these processes are completed, both the tokenized inputs and the attention mask are sent to the “device” which in this case is the GPU.

The previously tokenized input and attention mask are first passed on to the “.generate” function. Next, several parameters are passed to control the generation of the model. Please see Appendix B for details about these parameters.

These parameters need to be tuned by trial and error to achieve the required generation.

Once this generate function is run, the output of the model is printed as follows:



```
def set the model to evaluate to run prompts on the model for generation
model.eval()

#set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

#convert the prompt text to tokens and add the attention mask
input_ids, attention_mask = tokenizer(prompt_text, return_tensors = "pt").input_ids
attention_mask = attention_mask[0]
attention_mask[0] = 1 #set the first token as the start token

#set the generation parameters
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

#Generate the output from the model based on the parameter set here
generated_ids = input_ids,
attention_mask = attention_mask,
padding_token_id = tokenizer.pad_token_id,
max_length = 100,
num_beams = 10,
no_repeat_ngram_size = 2,
temperature = 1.0,
top_k = 10,
do_sample = True,
)

generated_text = tokenizer.decode(generated_ids[0], skip_special_tokens = True)

print(generated_text)
```

He drew his sword and pointed at the peculiar young lady. "Do what you need to in this town!" he roared. "We'll give it some time."

When the battle had gone on for three days without the use of gunfire, it was evident that the enemy army was not as powerful as he had been led to believe. The enemy did not possess a strong force of cavalry, as they often did during the day, let alone the infantry, but it was still capable of pushing the enemy back.

The soldier who had led up to the enemy's position ordered that the prisoners of war come to his ruler, while he himself marched to his camp, intending to relieve his comrades in the meantime. To his utter amazement, the wounded and sick found themselves outside his tent, and many of them soon lost consciousness.

On entering the camp, some thirty men were ushered into a small fire-place, which served as their shelter. A handful of soldiers came forward, but the general had already sent to them. Some of the prisoners stood up at once time, and others turned their backs, as if unsure of their own strength and lack of ascertainable.

"Not with," the prisoner answered, but he did not say what he expected from the general of the Third Army, nor did he know who it was. In fact, he had no specific order to take the prisoners. He thought it very odd, that the prisoner, without realizing it, had come to serve as his bodyguard. He felt a deep sense of responsibility.

They sat there in silence for quite a while, each soldier trying to guess at what had just happened. The general did not speak any more. He was beginning to tire, and finally, his staff officer came up to him, placed a hand on his thigh. "I think it would be best if you took the prisoner to a certain area," he instructed.

In order to be able to count all the soldiers in his command, the general ordered a small board with numbers to be placed all around him. These numbers were numbered from 1 to 99, and each one was to count to twenty from 1 to 20, in descending order of importance, and the general himself would be counted one by one.

The general's instructions to his men were simple: lie down and lay down on their sides.

Figure 8 Story/text generation sample from GPT-2 pretrained

As displayed, for the prompt given, the model outputs this result provided that the parameters in the generate function are set as specified. However, each time the generate function is called, the same generation may not be output considering how the probability of the next word may be evaluated differently on each call.

## Testing the Model with no fine-tuning

Similarly, the model can be prompted with several different prompts and the outputs can be seen as shown in Appendix A.

Here it is clear that the GPT-2 performs considerably well with the pre-trained data. This can be safely attributed to the data used during its training (Radford *et al.*, 2019). However, with it pulling data from various sources of text, there is no specific order to it and tends to consist of elements that are too randomized. While it is generating a good chunk of text, it is not in the style of how books are written and therefore lacks context.

Hence, it is imperative to fine-tune this model with the kind of text that the user may need it to generate in the style of and using elements from.

## The Dataset

### Explore the Gutenberg Library

Due to the nature of written content and how intellectual property law functions, they are inherently under strict copyright restrictions (O'Hare, 2005). Therefore, the book data to be used for this investigation needed to be open-source or free of copyright. The Gutenberg project provides a large library of written works that are free of copyright restrictions and therefore is free to be used in this research (Project Gutenberg, 2023).

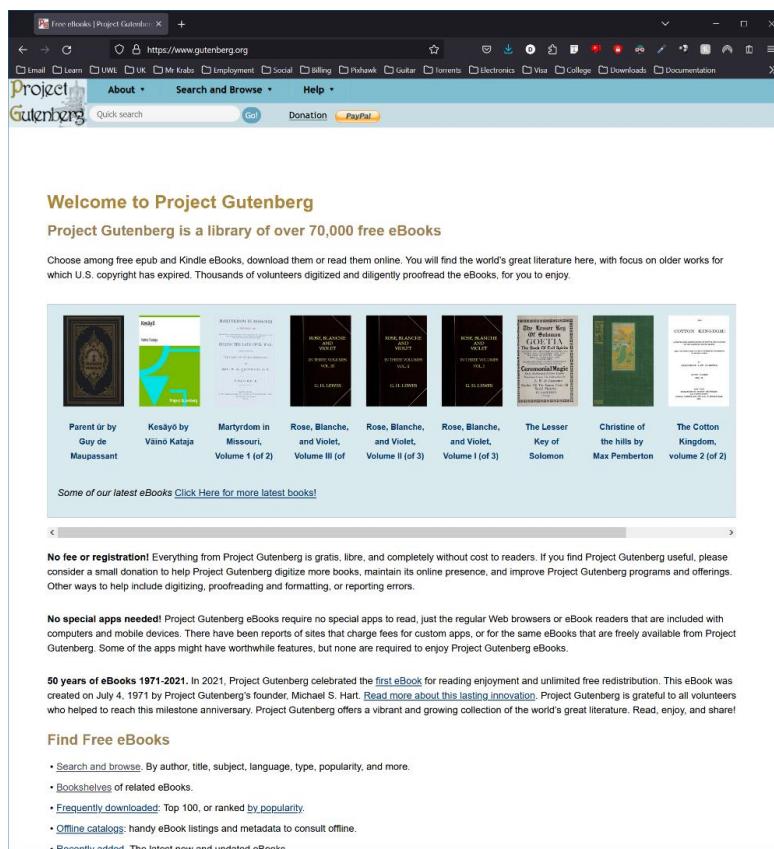


Figure 9 Project Gutenberg home page

Additionally, with its bookshelves spanning multiple genres, the fiction (or science fiction) bookshelf contains more than sufficient texts that provide the required data.

Navigating to the science-fiction bookshelf of the web site provides us the view shown fig x in Appendix C.

## Obtaining the Raw Text

For the purposes of this investigation, a random set of well-known works of fiction were selected:

- Twenty Thousand Leagues under the Sea by Jules Verne
- Around the World in Eighty Days by Jules Verne
- Grimms' Fairy Tales by Jacob Grimm and Wilhelm Grimm
- Macbeth by William Shakespeare
- Romeo and Juliet by William Shakespeare
- The Tale of Peter Rabbit by Beatrix Potter
- The three musketeers by Alexandre Dumas and Auguste Maquet
- The War of the Worlds by H. G. Wells
- The Time Machine by H. G. Wells
- Treasure Island by Robert Louis Stevenson
- Winnie-the-Pooh by A. A. Milne

This set of books provide us with sufficient training data (above 34,000 lines of text), to run the fine-tuning of the GPT-2 model. Larger set of data can be used for the dataset; however, this would also result in longer training times and heavier resource allocations (Kaplan *et al.*, 2020).

## Analysis of Downloaded Books

The following preview is a visualization of a typical text document (book) obtained from the library:

The Project Gutenberg eBook of Twenty Thousand Leagues under the Sea

This ebook is for the use of anyone anywhere in the United States and most other parts of the world at no cost and with almost no restrictions whatsoever. You may copy it, give it away or re-use it under the terms of the Project Gutenberg License included with this ebook or online at [www.gutenberg.org](http://www.gutenberg.org). If you are not located in the United States, you will have to check the laws of the country where you are located before using this eBook.

Title: Twenty Thousand Leagues under the Sea

Author: Jules Verne

Release date: September 1, 1994 [eBook #164]  
Most recently updated: October 13, 2023

Language: English

\*\*\* START OF THE PROJECT GUTENBERG EBOOK TWENTY THOUSAND LEAGUES UNDER THE SEA \*\*\*

Twenty Thousand Leagues under the Sea

by Jules Verne

### Contents

PART I  
CHAPTER I A SHIFTING REEF  
CHAPTER II PRO AND CON  
CHAPTER III I FORM MY RESOLUTION  
CHAPTER IV NED LAND

Figure 10 Default text story file from Project Gutenberg

Upon viewing the downloaded text documents, it is clear that the Gutenberg project documentation involves adding large chunks of boilerplate text to the beginning and end of each book that does not add to any contents within the book. Most books contain a table of contents and other non-relevant text at the beginning. This means that this text is essentially redundant and should not be used in fine-tuning since if left as is, the model will try to learn these patterns of text as well and may cause meaningless generations (Bender *et al.*, 2021).

Additionally, each line of text does not end in periods (“.”) and rather has an arbitrary breakdown (possibly a set number of characters). Therefore, some sentences are broken up to several lines and some dialog content is also broken up to several lines as well. This may affect model training and performance and may not provide accurate “sentences” for the fine-tuning of the model and therefore will affect its performance.

## Clean the Data

As stated above, the data cannot be used as-is and needs to be cleaned. The first step to clean the obtained data is to remove all the boilerplate content from the Gutenberg library from each file manually (including the table of contents and other content that does not add to the story):

Twenty Thousand Leagues under the Sea

by Jules Verne

PART ONE

CHAPTER I

A SHIFTING REEF

The year 1866 was signalised by a remarkable incident, a mysterious and puzzling phenomenon, which doubtless no one has yet forgotten. Not to mention rumours which agitated the maritime population and excited the public mind, even in the interior of continents, seafaring men were particularly excited. Merchants, common sailors, captains of vessels, skippers, both of Europe and America, naval officers of all countries, and the Governments of several states on the two continents, were deeply interested in the matter.

For some time past, vessels had been met by "an enormous thing," a long object, spindle-shaped, occasionally phosphorescent, and infinitely larger and more rapid in its movements than a whale.

The facts relating to this apparition (entered in various log-books) agreed in most respects as to the shape of the object or creature in question, the untiring rapidity of its movements, its surprising power of locomotion, and the peculiar life with which it seemed endowed. If it was a cetacean, it surpassed in size all those hitherto classified in science. Taking into consideration the mean of observations made at divers times,—rejecting the timid estimate of those who assigned to this object a length of two hundred feet, equally with the exaggerated opinions which set it down as a mile in width and three in length,—we might fairly conclude that this mysterious being surpassed greatly all dimensions admitted by the ichthyologists of the day, if it existed at all. And that it did exist was an undeniable fact; and, with that tendency which disposes the human mind in favour of the marvellous, we

Figure 11 Cleaned text file from Project Gutenberg

Once this is done, the text files are ready for processing.

These text files are then uploaded into Google drive under the folder named “Dataset” as shown below:

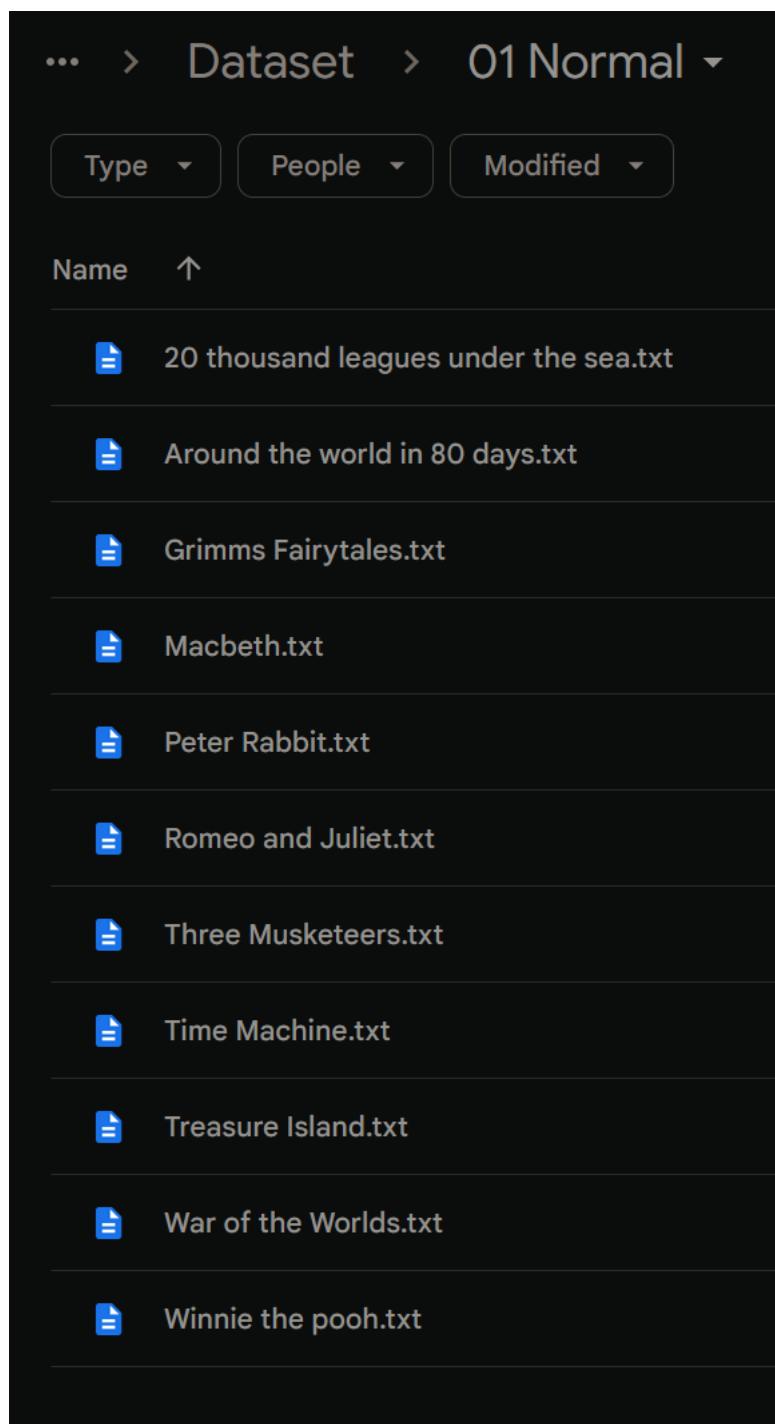
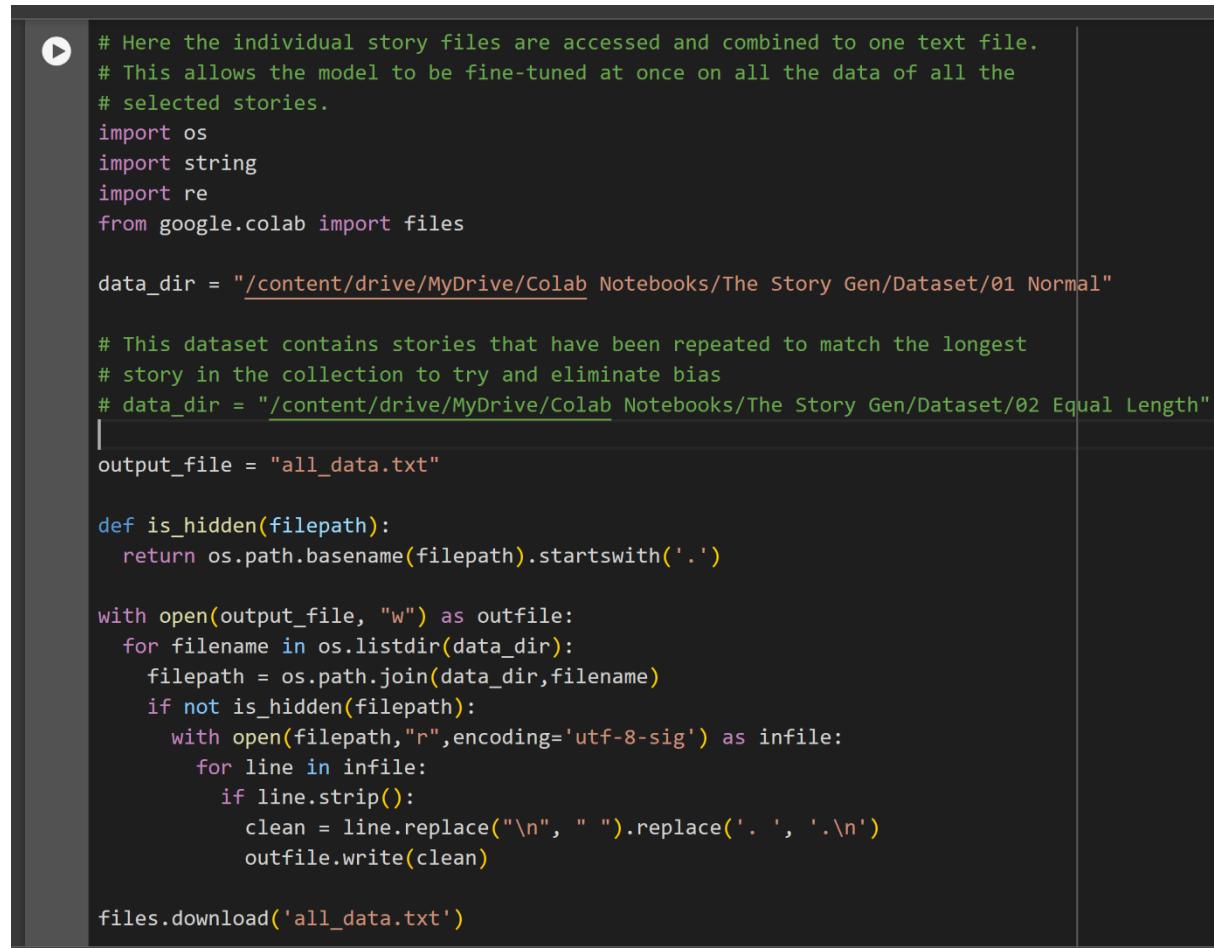


Figure 12 Complete set of story files in Google drive

Then the following code block is run to combine all the text of these files and add or remove line breaks around periods (“.”) such that the final dataset will have line breaks at each sentence:



```
# Here the individual story files are accessed and combined to one text file.
# This allows the model to be fine-tuned at once on all the data of all the
# selected stories.
import os
import string
import re
from google.colab import files

data_dir = "/content/drive/MyDrive/Colab Notebooks/The Story Gen/Dataset/01 Normal"

# This dataset contains stories that have been repeated to match the longest
# story in the collection to try and eliminate bias
# data_dir = "/content/drive/MyDrive/Colab Notebooks/The Story Gen/Dataset/02 Equal Length"
|
output_file = "all_data.txt"

def is_hidden(filepath):
    return os.path.basename(filepath).startswith('.')

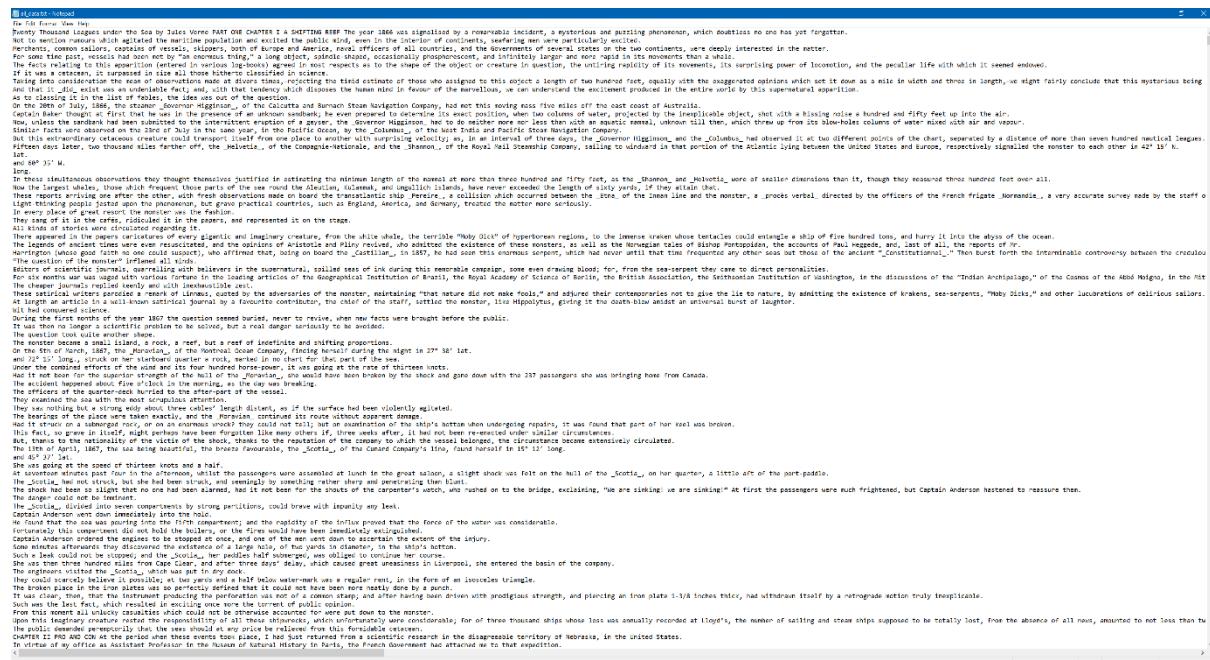
with open(output_file, "w") as outfile:
    for filename in os.listdir(data_dir):
        filepath = os.path.join(data_dir,filename)
        if not is_hidden(filepath):
            with open(filepath,"r",encoding='utf-8-sig') as infile:
                for line in infile:
                    if line.strip():
                        clean = line.replace("\n", " ").replace('. ', '.\n')
                        outfile.write(clean)

files.download('all_data.txt')
```

Figure 13 Story file combination code block

This procedure opens each text file (book) in the uploaded “Dataset” folder, takes each line in the file, and deletes all line breaks. Once the line breaks have been removed, it adds line breaks at each period character and thereby separating sentences in the text. Once that is done, it combines all these sentences of all these books in one “all\_data.txt” text file to represent the final dataset.

The final text file with combine data:



**Figure 14 Combined story file with new lines at each period**

One issue that was apparent was that at each title word (ex: Mr. or Mrs. or similar), there would be line breaks added and the sentence would be broken. However, this did not affect the training of the model and produced good generations as seen later on.

## Data Blocks from Dataset

Once this complete dataset file is created, the next step is to have a procedure that would be able to split the data in this file into separate sentences and convert each of them to tokens that can be used to train the model. This is achieved using the following `CustomDataset` class:

```
▶ # This class creates the dataset using the combined text file and the GPT-2
# Tokenizer. The combined text file's words are converted to Tokens for
# processing.
class CustomDataset(Dataset):
    def __init__(self, tokenizer, file_path, block_size):
        self.tokenizer = tokenizer
        with open(file_path, "r") as f:
            self.text = f.read().splitlines()

    def __len__(self):
        return len(self.text)

    def __getitem__(self, idx):
        tokenized_inputs = self.tokenizer(
            self.text[idx],
            truncation = True,
            max_length = 128,
            padding = "max_length",
            return_tensors = "pt"
        )
        tokenized_inputs["labels"] = tokenized_inputs["input_ids"]
        return tokenized_inputs
```

**Figure 15** Tokenized dataset creation codeblock

This step is performed because, in training any model, the only data that can be used is tokenized data. Therefore, all training data needs to be tokenized before passing them on to the model for training. Refer Appendix B for more details on this class.

### *The fine-tuning process*

#### Setting up the Trainer

Once the dataset is ready, the following code block executes to set the training arguments for the trainer function that fine-tunes the model:

```
[ ] # Here, the dataset, data collator and the training arguments are set.  
# These training arguments control the how fast the model learns as well as  
# the sizing of batches given to the model. The Epochs for training are set  
# here as well to ensure sufficient repetitions are carried out on the dataset.  
data = CustomDataset(tokenizer, "all_data.txt", 128)  
  
data_collator = DataCollatorWithPadding(tokenizer=tokenizer)  
  
training_args = TrainingArguments(  
    per_device_train_batch_size = 50,  
    num_train_epochs = 4,  
    learning_rate = 1e-4,  
    output_dir = './trained',  
    load_best_model_at_end = False,  
    evaluation_strategy = "no",  
    remove_unused_columns = False,  
    push_to_hub = False,  
    save_total_limit = 5,  
)
```

Figure 16 Training arguments, data and data collator settings

Here, first the data variable is assigned to the CustomDataset class which will return the training tensors. Afterwards, the data\_collator is set to DataCollatorWithPadding. This setting allows dynamic padding of each batch of data used for training. Although each sequence entered would be 128 tokens with padding tokens, the training happens in batches of data. Data collator makes sure that unwanted padding tokens are not used in the batches by making sure each batch is only as long as the longest sequence (sentence) in that batch. This ensures efficiency gains in training the model.

Next, the training arguments are set (Refer Appendix B for more).

These arguments are the most important in how the training is done on the model.

## The Training

Once the setup of the trainer and its arguments are done, the trainer function can be defined, and the training performed:

```
▶ # The infamous trainer.train() command passes all the training arguments
# tokenized dataset and data collator on for training the model.
# The training loss of the model can be seen in steps of 500.
trainer = Trainer(
    model=model,
    args = training_args,
    train_dataset = data,
    eval_dataset = None,
    data_collator = data_collator,
)

trainer.train()
```

Figure 17 Trainer code block

Once this block of code is run, the trainer function, using the arguments specified earlier, starts the training of the model. This will take a considerable amount of time and resources depending on the arguments specified and the size of the model and training dataset used.

During training, the output of the program will be at every 500 steps the loss will be printed as follows:

Step	Training Loss
500	0.831100
1000	0.780300
1500	0.758400
2000	0.744300
2500	0.655900
3000	0.635600
3500	0.645900
4000	0.648100
4500	0.577700
5000	0.547900
5500	0.542200
6000	0.544900
6500	0.512700
7000	0.469700
7500	0.470300
8000	0.470800
8500	0.470000

Figure 18 Training results for the model

Once the trainer has run through all the epochs specified, the model has been trained.

To save the trained model, the following can be used:

```
[ ] #The below two lines of code save the fine-tuned model in Google Drive  
model.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/model")  
tokenizer.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Generator/GPT 2 Finetuned/tokenizer")
```

Figure 19 Saving the fine-tuned model in Google drive

Here, a local copy of the trained model is created. With Google Drive integrations, the fine-tuned model can be directly saved into the drive folder for later use.

### *Regeneration and Retraining*

In case the model outputs after fine-tuning are non-satisfactory to the user, the model can be:

#### Retrained

This retraining should be done on the pretrained model and not the fine-tuned model since the fine-tuned model has to a certain extent converged on the training data (Goodfellow, Bengio and Courville, 2016). The retraining maybe done by increasing the number of epochs, changing the learning rate, changing the dataset, changing any of the training arguments or a combination of all.

#### Regenerated

This is by far the easiest method where, the user adjusts the generation parameters such as number of beams (for beam search), the temperature, the tokens etc. or a combination of the parameters. Additionally, adjusting the prompt may lead to a more satisfactory generation as well.

## Implementation

With the model fine-tuned, the capabilities of it need to be explored. In this section, the working fine-tuned model will be used to generate various story outputs. The objectives stated in the first section have been met and will be demonstrated using the generations of this fine-tuned model.

### The Story Generator

#### The Prompts

Each prompt used to verify the output of the model were randomized sets of words or sentences. The prompts used are as follows:

1. "He drew his sword and pointed at the peculiar"
2. "Nihara the warrior princess was calm in the face of danger. No one dared challenge her now."
3. "And so it was the beginning of a beautiful friendship. Perhaps even something more."
4. "Thine eyes shine like bright diamonds"
5. "Fly you fools!"
6. "The underground passage led to heaven"
7. "The ray gun vaporized the entire town under the sea"
8. "Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality"
9. "Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen."
10. "Aragon and Frodo along with Passepartout leapt from the plane"
11. "Great Scott!"

## Loading the Fine-Tuned Model

Once the fine-tuning model is saved, the model can be loaded into memory as follows:

```
[ ] #Import the required GPT2 modules from the transformers library for running
#GPT2 model
from transformers import GPT2Tokenizer,GPT2LMHeadModel,TrainingArguments,Trainer,DataCollatorWithPadding

from torch.utils.data import Dataset

# If a local copy of the fine-tuned model is unavailable, use the following two lines to load the model and tokenizer to load it directly from Huggingface:
# tokenizer = GPT2Tokenizer.from_pretrained("gpt2-medium")
# model = GPT2LMHeadModel.from_pretrained("gpt2-medium")

# Run the following to load the fine-tuned model on stories with original lengths
tokenizer = GPT2Tokenizer.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/tokenizer")
model = GPT2LMHeadModel.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/model")

# Run following two lines to load the fine tuned model trained on equivalent length stories
# tokenizer = GPT2Tokenizer.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/tokenizer")
# model = GPT2LMHeadModel.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/model")

if tokenizer.pad_token is None:
    tokenizer.pad_token = tokenizer.eos_token
    tokenizer.pad_token_id = tokenizer.eos_token_id

#Send the model to process within the GPU
model.cuda()
```

Figure 20 Loading fine-tuned model to memory

Here, either the model needs to be re-uploaded to the Colab runtime environment or it can be uploaded to the Google Drive storage and loaded directly from there. Once loaded onto memory, the model needs to be set to the evaluation mode and is then ready for generating responses.

The responses are generated using the following code block:

```
[ ] #Set the model to evaluate to run prompts on the model for generation
model.eval()

#Set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

#Convert the prompt text to tokens and add the attention mask
input_ids = tokenizer(prompt_text, return_tensors = "pt").input_ids
attention_mask = tokenizer(
    prompt_text, return_tensors="pt"
).attention_mask

#Send converted prompt and attention mask to GPU
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

#Generate the output from the model based on the parameter set here
output = model.generate(
    input_ids = input_ids,
    attention_mask = attention_mask,
    pad_token_id = tokenizer.pad_token_id,
    max_length = 1024,
    num_beams = 10,
    min_length = 1000,
    temperature = 3.5,
    top_k = 50,
    do_sample = True,
)

generated_text = tokenizer.decode(output[0],skip_special_tokens = True)
print(generated_text)

He drew his sword and pointed at the peculiar creature, whose white, rounded
```

Figure 21 Generation from fine-tuned GPT-2 model

Here, the prompt variable is the input prompt to the model. Once this block is run, the model will start its generation and output the result as a continuous text block.

## Responses

Each of these prompts were fed to the fine-tuned model and the output was recorded. Here, all the outputs range from 800 words and above due to the generation setting of at least 1000 tokens. The complete generations are detailed in Appendix A.

These responses are completely unique and may never generate in the same sequence due to how GPT-2 calculates probabilities each time and the variables like temperature specified in the generation command.

Here, using the same parameters as used for generating from the pretrained GPT-2 model, it can be seen that the model is pulling data and amalgamating text and styling from the various books it has trained from. There are elements present from multiple books (although not all of them):

- Prompt 1: The generation has elements from H.G. Wells and Jules Verne with the description of the peculiar creature with unusual physical features. Additionally, the mention of Musketeers shows the model using Alexander Dumas's work as well.
- Prompt 2: The detailed descriptions of sea voyages and references to famous navigators and explorers like Captain Cook and Dumont d'Urville show the model refers to data from its pretraining as well. Amalgamating data from fine-tuning, it references the Nautilus and the extensive journeys from the Indian peninsula to various parts of the world.
- Prompt 3: Here, the generation is mainly pulling from elements from H.G. Well's "War of the Worlds". However, the mention of Andrew Stuart is from Jules Verne's work. This again shows how the model can mimic the style of multiple authors and integrate various elements in their books in the generated story.
- Prompt 4: Here, the generation seems to be pulling generation style from Shakespear's work. Specifically, "Romeo and Juliet". However, it does not copy the tale and rather generates other elements but in the same style of the story.

Similarly, the generator works effectively by amalgamating writing styles and elements from the various authors it was trained on. Although, it must be noted that the training dataset was from a handful of books and not an entire literature corpus. This shows that the GPT-2 model is able to emulate these writing styles given minimal training data. Additionally, prompting the model with new data like the name "Nihara" does not inhibit its ability to generate an effective story with multiple elements and tones. Although, it does not incorporate the new data in its continued generation.

## Objectives Achieved

The research objectives are achieved as follows:

1. Having performed extensive research and emulating the methodologies on LLMs and fine-tuning them in this application, the Objective 1 has been achieved.
2. With nearly all the generations recorded, it can be clearly seen that the model is pulling content and elements from multiple books thereby succeeding in creating a unique storyline with many elements. This achieves Objectives 2.
3. With most of the generations it can be seen that the model is generating output in the style of a combination of authors which achieves the Objective 3.

4. With the ability to fine-tune the model on the fly, the software artefact allows any aspiring writer to have the power of this module on command. This achieves Objective 4.
5. Since training GPT-2 requires minimal hardware and can be done on the free versions of Colab, the objective 4 of universal accessibility of the artefact is achieved.
6. Additionally, since GPT-2 and the methodology used all are available for open-sourced free usage, the economic cost on the user is eliminated. Therefore, the economic consideration objective 4 for aspiring writers with low incomes is satisfied.

For a full list of generations by the model, please refer to Appendix A under the Generations by Fine-tuned GPT-2 model section.

With these observations, the objectives stated have been successfully achieved. The code implemented is error free and works universally with any text data that the user may want to fine-tune the model with. However, limitations of the free version of Google Colab may not allow for fine-tuning extensively on larger datasets.

## Ethical Consideration

With no human involvement in the development of the report and its complete usage of open-source material, the methodology used does not merit an ethical consideration. However, with LLMs and their applications having the potential to replace humans in a plethora of fields (Brynjolfsson and McAfee, 2014), the possible ethical implications of this software product need to be considered. Since the product and methodology followed creates a software artefact that is able to generate stories, there is a possibility to use this same methodology to create similar software in this literary works field as well as in other fields.

In the field of writing (creative writing or otherwise), there is an ethical concern of the ability of this application to replace storywriters, script writers, content writers etc. In other fields, such as music creation or any artistic works, this methodology maybe used to create similar software that may replace human creators and hence may increase the unemployment probability. This possibility for the artefact or methodology to replace humans in industries is a major ethical issue (Susskind and Susskind, 2015).

Additionally, the artefact maybe used to generate works that are non-original. Here, the user may create unique stories and rather than using the generation for inspiration or ideas, they are able to pass off the generated content as their own work.

To run this artefact, considerable computational resources are required. Continued usage of these resources mean that the emissions produced to allow their power consumption is increased. Hence, there is a considerable environmental impact as well (Strubell, Ganesh and McCallum, 2020).

# Evaluation and Reflections

## Evaluation of the GPT-2 Fine Tune Model

### Evaluation of Resulting Model

As seen from the generations recorded in Appendix A, the fine-tuned GPT-2 model generates exceptional and unique stories no matter the prompt given. In addition, as mentioned in the Implementation section, the model is able to pull details from the training dataset as well as amalgamate the style of the authors it was trained on. With this amalgamation effect, the model is able to generate unique stories with elements, characters and settings from a mix of the books used for the training. In essence, the model can be used as a source of near infinite inspiration.

Although the training dataset used was finite, using the methodology detailed, any user is able to train the model once more on their own custom dataset and have the model generate stories from that. Additionally, the training process is achievable by using the free tier of Google's Colab product and hence with all the resources required being free and open-source, this process and its end-result is achievable using little to no monetary resources.

As shown in Appendix B, the training time required for all **4 epochs** was around 1 hour. However, this was by using a V 100 GPU. Therefore, upon running fine-tuning on the free version of Colab with a T4 GPU, the training time for **1 epoch** was around 1 hour. Therefore, the **4 epochs** would require a combined 4 hours to fine-tune.

Unlike its default pretrained model that sometimes generate random data instead of stories (as evidenced by its generations in the Appendix A), this fine-tuned model would almost always generate a long form story that almost always pulls from the training dataset.

### *Issues and Solutions*

The first issue faced was that the text files obtained from the Gutenberg library would have a lot of boilerplate content from the project itself at the beginning and end of texts. This would have skewed the training of the model and made it think that information was relevant. Hence, this information was manually removed and only the story data went into the model.

Another issue was that, initially, the dataset was formed by splitting the stories into individual lines (at newline characters “/n” rather than at periods “.”) and rejoining each line of each story in the combined text file. Upon running the initial batch of training, the training would take around 4 hours. However, the generations of the model would be garbage content like a collection of commas, or inverted commas followed by single characters or nonsensical character pairings etc. Therefore, to solve this issue, while many methods were used including removing all punctuation, removing all symbols and removing all new lines. The method that corrected this error was removing all new lines and then splitting the data at periods and joining them in the final dataset file.

An issue that was encountered was that the model sometimes would only generate and pull from one story from the dataset. Namely: The Three Musketeers by Alexander Dumas. Upon inspection of the code and the history and initial training of the GPT-2 mode, it did not suggest any bias towards that particular story. However, the bias was in the dataset. The Three Musketeers story had the largest data block from the

entirety of the dataset. Therefore, the model would sometimes favor its generation towards that book. Retraining on the model was performed by repeating the other stories in the dataset to match the length of Three Musketeers. This however, did not solve this particular issue and a solution is yet to be implemented. The best solution was to have the model re-generate each story multiple times until a decent story that contained elements from multiple books was generated.

Another issue that was noticed in all the generations from the fine-tuned model would not have adequate periods in the sequence. Instead, the sequence would be a continuous set of words (although using punctuation) that was lacking any periods. Examining the data, the fine-tuning process or the code did not reveal why the model behaved in such a way. However, as seen from the generations, the stories generated were of decent quality.

## Comparison of Generations

The generations of the fine-tuned GPT-2 model were evaluated against other pretrained and fine-tuned models. The models used:

1. Falcon 7B Instruct model
2. Dolly v2 3B Instruct model
3. GPT-2 (Pretrained)
4. GPT 3.5
5. GPT 4

All these models are known for their text generation capabilities and have been trained on such data (Brown *et al.*, 2020). Hence, they are ideal candidates to compare generations with. Therefore, all of them were given the same prompt as the fine-tuned GPT-2 model and the generations were recorded.

A full list of generations and comparisons can be found in Appendix A.

Here, it is clear that while instruct models like Dolly-v2-3B and Falcon-7B generate decent long form stories, they do not perform as well or as consistently as the GPT-2 fine-tuned model does. Sometimes, these models would generate garbage or repeating content that has little or no meaning. Additionally, since they are not fine-tuned on the book dataset, their generations are in generic writing styles and do not reflect the writing styles of the authors the GPT-2 was fine-tuned on.

However, when considering the GPT 3.5 and 4 models, their generations are of a very high caliber. As seen from their generations, from the very first prompt GPT 3.5 is able to generate coherent stories by incorporating the prompt. When tasked with generating stories in the style of multiple authors, compared to both GPT 4 and the fine-tuned GPT-2 models, it tends to still generate in its default tone of generation and would not generate in any specific author's style. As seen from the generation, the model generated a story and mentioned the three authors that were in the instruction rather than generating in their styles.

GPT 4 on the other hand is superior in every way to all the other models compared. It generates far more coherent and superior stories with the prompt given and is able to maintain a very long generation as well. In addition, it expertly copies and amalgamates the styles of the authors specified. However, this GPT 4 model is only available upon payment. And hence, the fine-tuned GPT-2 model still has the advantage of being economical. Additionally, although the model is able to generate stories based on authors styles, it is not able to insert specific elements from specific works by the author. This ability to pull from the training dataset is a unique advantage that the fine-tuned GPT-2 model carries.

# Planning and Management

The plan that was followed for this exploration was as follows:

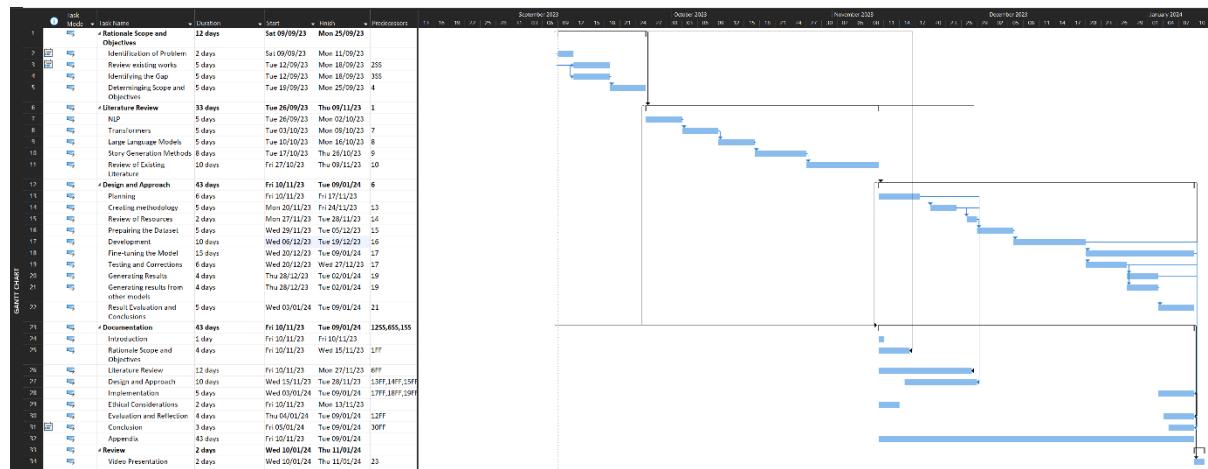


Figure 22 Detailed Project Plan

To view it in detail, please see Appendix D.

With an exploration of this nature, the supervision and guidance given by Dr Ignacio was invaluable. Each meeting provided new insights into each next step that I should be taking. Refer Appendix D for a breakdown of these meetings.

With these meetings, I was able to efficiently execute my project objectives. This included maintaining a diary of the tasks that were performed each week. The entries for each week of this diary can be found in Appendix D. The research methodology followed here was implemented with the guidance given and allowed me to research LLMs and NLP in great detail while being specific to the problem stated. Armed with this research, I was able to come up with the fine-tuning methodology for the GPT-2 model as shown.

## Reflections and Conclusion

In conclusion, the aims and objectives set out originally were achieved with the creation of the fine-tuned GPT-2 model. With its wide accessibility due to low hardware requirements, users with minimal resources will be able to use it easily. The fine-tuning process itself was intentionally performed on the GPT-2 model so as to allow for minimal hardware and hence the least economic cost. With the methodology described, any user is now able to fine-tune their own GPT-2 model on their own dataset to gain creative generations for their writing projects. Additionally, the fine-tuning process described may be utilized to test and fine-tune other models with respect to other tasks.

Some of the generations by the model did not have sufficient punctuation and improving the data cleansing and amalgamation processes may train the model more efficiently and allow for better quality generations.

Although some models like GPT 3.5 and 4 may already provide the functionality of story generation, the customized generation by amalgamating multiple books and author styles may only be achieved by such a fine-tuned model. Additionally, it allows for non-generic unique generations as seen from the results listed

in Appendix A. By using a limited set of authors, the model was able to better copy the style of the authors, which may not have been the case if trained on a larger dataset with multiple authors. To completely copy the style of an author, the model could be fine-tuned using only their literary works. However, this may have caused the model to generate content that is too similar to the author.

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# The Appendix

## Appendix A: Model Story Generations

In this section, the story generations of all the models compared in this exploration is listed. Due to clarity issues in the Colab notebooks, these outputs have been manually copied from the generation. Additionally, since Chat GPT 3.5 and 4 have properly formatted text that is sharable, those outputs will not be inserted here and rather a link to their generation is included.

All of these generations are for the same 11 prompts listed in the Implementation section.

### *GPT-2 Pretrained*

#### 1. Prompt: “He drew his sword and pointed at the peculiar”

##### Generation:

He drew his sword and pointed at the peculiar young lady. "Do what you need to in this town!" he roared. "We'll give it some time."

\* \* \* \* \*

When the battle had gone on for three days without the use of gunfire, it was evident that the enemy army was not as powerful as he had been led to believe. The enemy did not possess a strong force of cavalry, as they often did during the day, let alone the infantry, but it was still capable of pushing the enemy back so far. The general felt it was imperative that they make use of every available source in their power, and on this very day his troops found themselves completely surrounded in their own camp.

The soldier who had led up to the enemy's position ordered that the prisoners of war come to his relief, while he himself marched to his camp, intending to relieve his comrades in the meantime. To his utter amazement, the wounded and sick found themselves outside his tent, and many of them soon lost consciousness. When the guards found out about this, they were furious with their own leader, saying that they refused to be the first men to go to relief.

On entering the camp, some thirty men were ordered into a small fire-place, which served as their shelter. A handful of soldiers came forward, but the general had already sent to them. Some of the prisoners stood up at one time, and others turned their backs, as if unsure of their own strength and lack of ammunition. As the general walked by the prisoners, a man in one of the first groups turned his back to him, but the general spoke. "You want to come with?"

"Not with," the prisoner answered, but he did not say what he expected from the general of the Third Army, nor did he know who it was. In fact, he had no specific order to take the prisoners. He thought it very odd, that the prisoner, without realizing it, had come to serve as his bodyguard. He felt a deep sense of responsibility for his fellow soldiers, for he had been the cause of what had happened. But then, he felt, he was only doing what the man would have done, had they been in his position. The officer who led him walked over and put his arm around the soldier's shoulders. "You'll be safe here," he said, "because I'm your General."

They sat there in silence for quite a while, each soldier trying to grasp at what had just happened. The general did not speak any more. He was beginning to tire, and finally, his staff officer came up to him, placed a hand on his thigh. "I think it would be best if you took the prisoner to a certain area," he instructed him. "He may still be dangerous, but we shall see what is in store for him. Now, you can leave if you wish, but the general will stay for a while longer." It was obvious that this was the last opportunity the prisoners of war to enjoy a brief respite. By now they were on their way to their appointed place. It was as though he had ordered them to get back on horseback. "We'll be back as quickly as we can," he assured them. After a moment or two, some of the prisoners left the fire-place, while others sat down at their camp. The other soldiers were not aware that he had gone away until he was out of sight and had returned with the men he had taken with him into the enemy's camp. They were confused as to why they were left in the middle of nowhere, but at least now the general would know where his force was located and which side of the front was at the head.

In order to be able to count all the soldiers in his command, the general ordered a small board with numbers to be placed all around him. These numbers were numbered from 1 to 99, and each one was to count to twenty from 1 to 20, in descending order of importance, and the general himself would be counted one by one every ten steps. The number 99 stood for the General of the Third Army. There were about one hundred of them at his command, all with their numbers printed out. The men in front were numbered on the board, with the few behind them counting to nine. The general also made sure every man had a uniform and clothes, so that they could be recognized and, above all, that they would be able to take care of themselves, if anything happened. At the head of this column stood the general, with all the men in the front, and then each man at the front had a weapon in his hand, and could fire at any time without disturbing his colleagues. The people were separated into groups, each with a flag, and the general set up his tent as the camp commander for all those who wanted him out.

The general's instructions to his men were simple: lie down and lay down on their sides.

<-----End of Generation----->

2. Prompt: "Nihara the warrior princess was calm in the face of danger.

No one dared challenge her now."

**Generation:**

Nihara the warrior princess was calm in the face of danger.

No one dared challenge her now.

"I will defeat you. And if you defeat me, I will destroy the village. But no matter how... I will keep you as a slave forever."

Kudou sighed as his body shook. But for some reason, even as he spoke he felt that he could not speak in such a violent tone. He was at a loss how he could make it through the battle while maintaining his cool composure.

"... It really is amazing that you have the resolve to destroy me. That's a sign of your strength, not that I can't kill you, but that's not the point of this battle. It's about you killing yourself. Once you kill yourself, then there will be no stopping you from turning the village upside down. That's all there is, that's all we can promise you. If that is what needs to happen to me, then that is the will of my king." While he spoke, he extended his sword.

...

"... You don't believe that I can do it, though?"

When he turned around to confront Hachiman, Naofumi felt something strange. He felt Naofumi's breath on the sword and it was even more than usual. He wanted to ask Hachiman about that... but how would he get the sword?

"No, that isn't the problem. I won't just sit idly in front of you like before. What I'm asking you is whether your resolve can be said to outweigh your ability. That is the true test. Whether you can reach your goal now or will you fail to do it when you make a mistake of such magnitude? Are you that strong? Are we that strong in the end?"

With that said, Naofumi looked up to Noda.

"If you want, I'm also going to make sure it's this way as well."

Naofumi looked around the village.

In the city where he was living, there were people gathered together in groups.

"In the end... why do they continue to say that Naofumi can't win? Well, the fact they didn't want him to enter the village before was because they didn't think that there would be a miracle. Now, I can see that they are a bit wrong. If there would be no miracle, everyone would realize it. But that is not possible to happen right now, so they continue to say it's all possible. However, that is not the kind of reasoning I use. I'm only interested in whether this is something we can accomplish today."

"What?"

"If the people can realize that this is only possible if they can believe in it, then I see no reason why we cannot do it."

"Exactly."

"Then I will do it tomorrow and make that village look as if nothing is wrong. This is all I ask of all of you. There will be no turning back from that. After all, there was no way Naofumi could fight against me."

"That doesn't sound like a reasonable reason for all of us."

"And if it's not a reasonable reason... are you willing to sacrifice your dignity, and your strength to save them?"

Noda's question was unexpected. He was surprised at the sudden calmness in that voice. He wasn't expecting that from this man.

"To be honest, I do not know whether I believe in this or not either. But I want to save my people. They are my children. I will not abandon them just because you ask me something that you think isn't right. You may think this is a lie, but that will not make you change your viewpoint."

It was surprising for a man of the royal line to say that after all this. Hachiman had fought against Noda and fought alongside him, so that was not an easy thing for him to understand.

"I don't really have an easy time believing that there isn't any reason to change. Even now, if I'm told that the whole world is going to go to hell for something like this and there is no way we will win against it, then I am convinced. Or maybe, just because I am convinced, I am unable to believe in miracles. I really can't do that."

"... You seem to have lost that resolve in front of all this. A man of this country should be more of a warrior hero than this... I suppose that may not mean that much of a stretch for a man like you though. Even so, I wonder if you're really that calm as well? Is that all because you're afraid that someday you won't survive?"

"... Naofumi-sama."

"I want to see the sun rise on the same day."

"And how about when it does? How about at sunrise? I'm looking forward to that."

"Is that something that you

<-----End of Generation----->

### 3. Prompt: "And so it was the beginning of a beautiful friendship. Perhaps even something more."

#### Generation:

And so it was the beginning of a beautiful friendship. Perhaps even something more. I asked her whether she ever thought back to that morning, what she would have asked her, if she were alive at this moment. She smiled and replied: "Yes, you would have."

"Well I would have wanted to say yes. I'm sure we could have talked about everything. But there was something else we wanted. Something we never could have accomplished together. Something we never could have done together and I know how much that's hurt." Her eyes lit up. "I know, it's something you haven't fully understood." She paused and took in a deep breath and said, "I'm afraid I know. I don't want it to make you sad. I don't have anything to talk about. I think I'm going to take a bullet for you." It felt good to see such compassion and compassion in someone. Something changed. I knew now that this woman truly cared and understood me that much. For that time, she could be with me even if only briefly. "Thank you again," I said, "I think I'm ready for our little trip." She laughed and thanked me and then we drove back home together. I couldn't even begin to imagine how wonderful she felt with me.

I made my way through that night wondering what the hell happened and what I should have done. I had no clue how to explain the death to a grieving parent of a child killed in action. I had no plan for the days ahead. It wasn't just my wife and two wonderful children. It was my entire life. I tried to get back on the path I left. But I was a broken child. It wasn't fair that I had to live with such loss.

There are days when you want to walk away but there are times when the best thing you can do is keep holding onto that fire. It isn't over. It doesn't take much to kick it.

Some day I'm going to have the fire back. Some day we'll be sitting together in a diner and talk about this.

Whatever you do, remember the woman I lost. She was my mom. And my mom was my friend.

I'm so happy that we can look at her like we saw her in a movie once. The way she smiled and laughed and held on to love. A good friend. You can learn more about her at her blog and you can also find more by following me on my Instagram, Facebook, and Twitter, or by liking the blog via the buttons on the right. I'm also a fan of her art at her Etsy store and I'm going to start doing more of the fun stuff too.

I feel blessed to tell you I survived and I'm grateful for all that God has given me.

Thank you for reading.

Peace and love

I know you read this but I wanted to give back by sharing my experience with you of what happened the night of the night I found you. I'm not sorry that I did this but it has been tough to think of something that I wish I had done differently that night. It was very hard to even talk about anything that I never wanted to talk about that day and I feel like I hurt you but it's a process to forgive yourself. Maybe if I would have gotten away from that place of sorrow and confusion before I did and started to learn to forgive myself, perhaps I wouldn't be trying to hide a secret like this from you right now. You are the reason why I love you. As I write this you know, my life is back on a course much different than it appeared right before I found out that I was pregnant. It seems like every time I think I'm done, it seems to get worse. I feel like every week I realize that it's never going away. But I'm learning and trying not to dwell on that anymore. Let me make it very clear to you. I'm going to find a way for this to be okay for one and maybe even both of us. That's just the truth.

That night of the night I found you. That's who you were that night in my arms. That night you kissed me and put your arms around me and I thought that was my last and I still do. That night of that night you kissed the ground, I thought you liked it and loved it. I didn't but it took me a long time to see that you liked what I did then and now and it is something I know you would do again if you knew how.

All it took was one call from my wife. I got that call a week later to tell her what would happen next and how I felt about it. I didn't want to say too much but I said something that was so beautiful that she told me I would never do that and that what happened that night

<-----End of Generation----->

#### 4. Prompt: "Thine eyes shine like bright diamonds"

Generation:

Thine eyes shine like bright diamonds."

It was then that we heard from a close friend on the telephone that "he" had been shot and seriously injured. It was said that when I returned to my home in the village, "my eyes were bright, but his eyes did not give me much confidence" (from the book). When my friend heard what had happened to "him," that is, the shooting and the wound to his eye, he was greatly shaken and cried out, "He can't breathe!" "But," he reassured me, "he wouldn't wake up unless I put him on his back!" He continued that it would be better if the wounded man would be taken home and kept there, for at that point it was too late to do anything, that was why he was going with the injured man to the doctor who was staying at the camp. The friend added that the doctor said that it would be best for the man to live in a hospital until he could recover enough to walk. I said of course that that was only a suggestion, and that my doctor had made his own judgment: "Well, we are afraid of him dying from the bullet." "Yes, he is alive, and we will let him live out this night" I assured him. At the camp, the doctor took the wounded man, and then I went alone and talked to the doctor and the others about the man for a good half hour. "Well, we feel that it must be better for him to live this night. What do you say?" I asked. "You think that?" he answered. I gave him my own suggestion: put the man down and wait till after sundown. He said that was best, and that I was to help him to his feet and run away to help him. It was quite some time before they reached their camp. I soon got up and went to the road and began to walk back home, when I suddenly remembered something. "Oh, we must get the wounded man home in time to help him." I rushed to my friend's camp to look for him and to see him in hospital. When I reached him I realized that he had lost an eye. I didn't understand much about the eye but I remembered what had been said about "seeing the wounded man." It occurred to me that for me, as a Jew, as a member of the tribe which was destroyed and destroyed by the Germans, I should have no need for healing, but I had done more than anyone to save my brother. It was my belief, my instinct, that, at least for one hour, if not a few hours of daylight, I would see my brother, my good friend, who was sitting on my right. My instinct was to go. I left the camp, walked a few meters and then came up on the hill where I saw my brother's corpse lying on the ground. I stood close and whispered to him that I wanted him to come out from under the tree, and asked if he should go to see me. He hesitated, then he went to the tree and told me what had happened to my dear friend. That was all. I did not see him again for many months, even after the tragedy which was happening in my heart, and when I called my mother she said I had lost him, but even now she is waiting for me to hear the news. My mother and brother did not get to know one another very well until they left the village; I am glad that in some ways I had a good memory of my young friend. My father never forgot me, but now that I am at last going home again, I will remember him more vividly. I am quite certain that my brother will soon be back at the hospital, and he may even know me, and perhaps he will talk to me a little again too. I am glad he is alive because he was one of the good men who helped us. Now that I have spoken of my brother, of my brother's life gone before, of my brother who was the brother of my brother who was among the survivors, we can say that there will be no greater tragedy in this land than that which befell "my dear friend," a Jew who was trying to take the life of his Jewish friend. How do you say to a man who was innocent to be guilty of the crime with which he died for the love of his

community? And if the Jew who was innocent had been allowed to carry out the killing in question and done as he wished, would not that crime have remained? If it had, then he would not have lived at the same time as I did. In my village, not only was the Jew guilty for his own murder, but he deserved death because he had done the Jewish man wrong. My father was proud and proud of the Jew who was innocent of the crime of suicide, because he wanted to live with the victim who had killed him. "I love my Jewish friend who died so young, for I never wanted to

<-----End of Generation----->

## 5. Prompt: “Fly you fools!”

**Generation:**

Fly you fools!

The world must not know what it has heard..."

—Chorus of the song by the Talking Heads

I'm about to go on a ride,

The sound of your bells on a summer's night!

You may not go home, I'm home now.

But the stars and the wind

All sing for us, the way we've been trained

To dream dreams in a dreamless night.

You know, dreams do have meaning—

But here I am at last, here I am.

When you're tired, the music is over.

You know...

—Chorus of The Velvet Underground song "Dreams" by The Velvet Underground

I thought I had gone home,

I'd had enough of home, a cold and damp place, but now...

You've got my heart, my throat, all that I have,

It was an awful place to die.

But we're free to take our breath away

And I don't want to go, I'll just wait here,

There ain't a chance in the world, I'll keep on dreaming...

...I just keep on dreaming...

I'll go on dreaming when it's just me and you And when the time comes you'll want to see,

I'll hold on to it, just in case...

I wish someone would keep on dreaming about me And I wish someday you'll want to see,

I'll want to hold onto it...

...until the time comes to forget...

I just want to forget, I just kept on dreaming and never got tired

(I hope it lasts until the last breath... )

[Chorus of The Velvet Underground song]

"Dreams I've made when the sky is black and I'm alone in the woods I'm not allowed to dream of it  
I've never dreamed the dream of being free of home

But here in this cold, gray night I've lost myself to my dream I've dreamed dreams and never quite  
realized it

You've taught me to trust myself, I've learned to trust me you've taught me to know and trust you

Dreams, when the clouds come up and I'm free I go to wake up and see them again

They'll tell me that my dreams are just dreams and that dreams mean nothing because when the sun sets

The stars will be in my dreams and I'll forget them

The world won't know what to do with me... you're free, now, I'm home, where can I sleep now?

Where can I go when the moon's out and I dream about things I can't dream about anymore

When I'm sad I'll cry, you're just sad but you can't take it away

(I hope it lasts till the day I die.) [Chorus] Dream of freedom...

Dream of free, I dreamed about it and it worked out. Dream of freedom. I don't give up hope yet

Dream of freedom, I won't let it stop me

I can see it shining around the corner.

There's nothing left to do

Now that's freedom. Dream of freedom.

I know it's possible. I know.

There's more freedom, I can't wait for it

I want to make the dream so real

I want to make my dreams so true, I want to feel free

But I'll do what I have to, and that's all that I need

DREAMS...I WANTED IT ALL TO HAVE BEEN HERE, NOW!

WHEN THE SUNSET IS OVER, EACH SONG IS OVER

FREETOWN...

WHEN I OPEN MY WINDER, I HAVE

THE NIGHT...WHEN THE SAME SONG CAN COUNT FOR MORE

AND SOUNDS ARE LIKE A CIRCLE, ALL THE HAPPINESS OF IT ALL IS OVER

I KNOW...

IT IS THE SONG OF FREELOADMENT!

I will sing for your freedom;

When all of my dream came true...

I want a dream that brings me joy,

For all of my happy moments have been filled with you so.

It's just like the dream I had in college... it's just as beautiful as the dreams I'm now having...

Just as beautiful. Just as beautiful. I will stay in your wake

As long as you need me right now. I want you here

To be in my dreams

FREETOWN!

Wake up and look at the sky... to see where it's shining,

To hear and to feel the wind, to be free...

And

<-----End of Generation----->

## 6. Prompt: “The underground passage led to heaven”

Generation:

The underground passage led to heaven and the heavens. It was all that remained of the city.

After the passage was finally closed, it was decided to leave the city and explore the area in its entirety, and to make sure no one would ever see it again.

One day after sunset, the city fell silent. No one could understand what had happened.

One day later, when the sun's rays were beginning to reach the city, a man made a sound with his voice. He stood by the entrance of the underground passage, and it seemed that he had been heard. He looked around, and there he saw someone standing in the middle of the passage.

"I've been here before," he muttered, and walked over to the person.

"What have you been doing?" the person replied.

"I've been talking to you," the man said.

"Well," the man said, "I'm afraid I don't believe you."

"No, you're quite right," the man replied.

The person nodded.

The person walked away. It was then that the man realized he was being watched.

"Wait," the person whispered to himself. "Why did you go and talk to me? Who did this to me?"

"Well," the person began. "I'm afraid I don't know," he explained. "I've been here before."

"Why didn't you go and tell me?" the person inquired.

The person answered, "I didn't know who you were then."

"Why did you wait until now?" the person asked.

"Well, because you're trying to protect me now," the person said. "If you'd let me go, then I could have helped you."

"But if I let you go now," the person continued, "then I'm going to hurt you."

The person was silent for a long time.

The man finally said, "I'll go and tell you."

He walked out of the underground passage, and out of the darkness, into the light. He opened a door in the darkness and walked inside it. Inside, he turned on the light to reveal that it was dark inside the room. The man walked around to look around again, but there was nothing else.

"Come on," the man said to himself. "Let's get out of here."

He walked out of the room and into the light again. There were now three people inside. One of them was staring at him, and the other two were staring back. The man stood up, walked over to them, and asked, "How did you know I was here? What did you see me for?"

The one who answered was silent for a long time after that.

"What did you see?" the man asked.

"I saw you. You saw me."

"Where was I?" the one who stared back asked.

"In your cell."

"In a cell?"

"In your cell. It was in the middle of the city, on a rooftop."

The one who stared at him began to cry out in pain.

"Are you okay?" the man asked.

The one who stared back said, "I'm fine. I just wanted to tell you that I am here to protect you."

The one who cried out in pain began to cry.

The man took the one who cried out of his sight.

"What did you do to me?" the man asked again.

The one who stared back answered, "I just wanted to know what you did for me."

"Why?" the man continued to cry.

The one who stared back said, "I just wanted to tell you what you did for me."

The man walked over to the one who looked at him and asked, "Did you kill her?"

The one who stared back said, "No, she wasn't dead. She was just asleep."

"Do you know what happened to her?" the man asked.

The one who stared back said, "No."

"She's still here?" the man asked.

The one who stared back replied, "Yes."

"Why are you still here?" the man asked.

The one who stared back said, "I'm still here to protect you from evil."

"What's evil about evil?" the man asked.

The one he stared at answered, "Evil is killing."

"Do you believe in the devil?" the man asked.

The one who gazed back answered, "I don't believe in the devil."

The one who stared at him answered, "Then what is the devil?"

The one who stared at him

<-----End of Generation----->

## 7. Prompt: “The ray gun vaporized the entire town under the sea”

Generation:

The ray gun vaporized the entire town under the sea. "And that's the only thing I have to look forward to this time." The air began shaking violently, and everyone seemed to feel a strange sensation. Ryuichi opened his eyes. He saw that even though he was still floating upside down, there was still a single light shining through him.

"Uhh... Huh? What happened? I just fell off." It was an odd feeling.

Just then, he heard a faint cry from the town, and froze in place. He didn't feel any pressure, so there wasn't any sense of danger.

He didn't expect to be greeted by someone who didn't recognize him at all, so Yuigahama couldn't be a threat. "How about you give up and go." With that she left Yuigahama's room, and started on her way. "I'll deal with the rest later on..."

"That's not it." She didn't stop her steps, but she looked down at the floor.

"So you want me to have sex with you?" Was that a joke?

"... Eh, it might be a good idea." He muttered, as if he regretted saying that.

"That would be an amazing idea... but you have a girlfriend, so you must be careful of your own feelings. That can't be easy for you, huh?" Even if the pain could be felt by her body, it wasn't like she could even feel it inside.

"Oh? What does it sound like? You want to see her too?"

Even with her not having sex, he was still too weak for this world. Perhaps because he was too weak to get his heart back to life, he was unable to resist her advances.

That was why.

As a human woman, her body was strong. Even if the feelings she experienced while on this plane didn't affect her with his, she still felt them. If he went back to this world, he could easily get rid of it as well. But she did want to become a man, and she understood that she had to make him understand that she needed to use her beauty to attract men. If he did the opposite, she wouldn't want him anymore.

She thought he was a worthless person, after all. If he wasn't able to return home to this world, wouldn't that mean losing her virginity to him by force?

He didn't need to be ashamed of having her as a girlfriend. That was why he wanted to return.

But what if that was all a plan?

She had tried to talk about that with a friend, and she wasn't supposed to say that in front of the others, of course. But she wasn't talking with Yuigahama now, and he wasn't able to think clearly about what to do. She would be unable to understand the pain she caused him. He wasn't even aware that he even wanted to lose his virginity. This was only what he didn't have control over anymore; there was no choice left, regardless of whether she would be allowed to use magic to be with him. It wasn't even close.

He desperately wanted her to feel it, but that was impossible. It was impossible. This was different from what he'd imagined his heart to feel.

The only way to protect her was to convince him.

And he could only do that if he had the ability, which didn't exist right now. After all, he still hadn't gotten rid of any of his feelings for her. He had to hope she would give him the gift he wanted as the only thing she knew for him.

It was not his own fault for being weak. Why did he become so weak that this woman, who had been weak all his life was even stronger than he ever was!?

The memories that he had of what it felt like for her to walk in front of him with that face were still the same. He could only remember the feeling of having his virginity stolen by her, in a world where it wasn't an issue. For some reason that bothered him a little, it really hurt to see it. The feeling of losing his virginity for her seemed so normal. The only ones who didn't lose their virginity were him

and his family, so why could it be so different for a girl? It was more like she was still a virgin, since it wasn't an issue...

That was why, when he remembered everything, a sudden thought ran through his mind. Why wouldn't she say it? She could have been lying, and it was easier to convince herself if she did.

"Rin, why would you have sex with someone who you thought was weak?" For some reason, there was an emotion burning in that person's eyes.

Rin, what?

"I thought that you were still weak because you were so scared, right? You should know, I can't stand it if I can't sleep

<-----End of Generation----->

## 8. Prompt: "Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality"

**Generation:**

Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality. This was the essence of their creation. There was nothing wrong in that. In reality, it was the very fabric of reality, and everything they had created, in their mind, belonged to them. They had never lost that sense of unity, because they did not have their own body, and from the time before they came forth, that body that had been created by them was completely separate from the one that had arisen from the primordial entity.

Nadishan, Nadishan and Dilshani came to be when their original bodies were no more. They were separated from Adam and Eve in their spiritual state, from the world and their own body. This separation is a very good thing in itself. But, there was no way for them to be free from their own spiritual experience. There was not a real separation from it as a material body existed. But, the spiritual experience of those two individuals was the essence that created their existence at the time the world was born, and it contained all the possibilities that were necessary for being created in this plane of existence. That spiritual experience of their own body existed in the form of the self and all the properties and abilities that did not appear on the material body, and then, those self and all things that did not come from their own body, but came from others. Their spiritual experience contained their inner self, so it was a true spiritual sense. Then, they were able to express their experience to others, to others can express it to themselves. That was a profound experience of the power of love. They could feel the joy of love through their emotions, the love of love in the heart, their whole being. That was the love that was present there, and they could feel and love it as though it were their very essence. They had the most wonderful connection with God and their God-realization.

They were created after these two spiritual beings. When the spiritual beings were created, and they started their own spiritual existence, they experienced a great difference from how they first appeared. It was a real, spiritual experience of the love with which both of them saw each other, and

the joy they felt in each other. Those two spiritual beings, because of their profound spiritual experiences that they experienced themselves, experienced them with such love that they could feel the joy that was not there on earth, on the earth-world.

Nadishan said: "O world. How beautiful you are."

He said this simply, "It is as if we are seeing ourselves."

All beings who know the nature of creation are familiar with the fact that in creation everything is made from some type of matter, or substance, and that there are two types of substances. They are as follows: that which has an attribute, and a negative attribute, in this case. The attribute that does not have a negative attribute, but contains a positive one in it — the element, and its positive and negative attributes, in which the energy of that attribute is located. All of the attributes can be found in one place, the nature of this one place, just as the attribute of fire has all its attributes in one place, the substance of the element of fire in this one place. That is what creation is and that is the essence of the universe, in this matter. If this place, the essence, were to disappear, there is no form, no energy, no matter, which could come from this essence, in order for all beings to realize the true reality of Creation. Therefore, one must realize what creation is in the entire universe.

What does this essence have? It's love. It is the most beautiful thing that any being can possess, and that is the essence of Creation as a whole. All the universe has its own form, and this is the form of the Essence of all beings. If you take away anything that is in the universe, in this space and that dimension where all things exist, you are leaving the essence. You are creating your own essence, the essence of creation. It has all of its various properties and abilities and all the attributes, in this space, the essence. You can't create your essence in any other space within the universe. Only you can. Only you, and this one place, your essence is what all beings in the universe see, hear and see, feel and experience through their feelings and thoughts. Then, they can see the glory that is within and see that which belongs to it, which has its own attributes, which has its powers and all its attributes and is the essence of creation. It has all these separate qualities and abilities, but there is one form, and, that is the essence of creation, in which all of the physical elements, all the physical elements' properties and abilities, are found; and it has been created. That is the spiritual essence, which is inside creation, in all the worlds

<-----End of Generation----->

**9. Prompt: "Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen."**

**Generation:**

Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen. 【Lion Princess】 Suj. An angel who became a princess due to her husband, her father and the prince who ruled the kingdom as its sovereign. Despite her noble past and beauty, in a

certain way she has a cold and calculating personality and often seems to be unfeeling 【Tiger Queen】 Janu. She is known as a tiger-faced goddess and once fought against her father to protect her people from the Black Dragon Zangetsu, whom she believed to be an incarnation of chaos, as well as for her heroic actions. She is very loyal and caring towards her daughter, who serves as her sidekick. The only difference is that Janu loves cats much more than humans do 【Kabuki Princess】 Sujika. Like Janu, an angel who became a princess due to her husband, her mother and the ruler of a neighboring kingdom, she has a cold personality and is cold and unfeeling. Like her mother, she likes cats when they are cute and has a strong bond with the cat princesses. However, she has an unhealthy personality and hates cats and wants them out of her sight more than humans. 【Sorcerous Goddess】 Sujichika. The leader of the princesses. She is very strong, cold, cold-blooded, cold, cruel, ruthless and ruthless. She hates humans because she is the princess of the demon world and believes that it should not be given a chance to rule. She is merciless towards humans who refuse to go along with the demonization of demons as well as all who try to rule them. She loves cats that are small, who are cute and who are not vicious or greedy. Unlike her mother, she likes kittens more than her father likes humans 【Lamb Princess】 Sujunka. A beautiful woman who is very cute and has no negative attitude towards people. At first, Sujunka loved humans, whom she believed to be beautiful people, but she soon changed her heart to those who are weak or who are inferior. She once hated humans. However, she is brave and will defend her people whenever necessary even if she has to kill humans to stop her family from killing others. 【Mountain Girl】 Suzume. The most beautiful maid in the royal family. She was the original one who tried to change Suju's name, because of Sujichika, but she was unsuccessful in doing so. She was defeated when an angel's sword slashed her and fell to her knees, as if she died. She is currently serving as Sujika's childhood friend, and though she does not take kindly to Sujikana's cruelty towards humans, she loves him greatly. Suzume is also the princess of the mountain clan. Her father took over the country after the Demon King was captured and is protecting it, and her younger sister, Suzuka, is married to Sujiji. 【Ritual Swordsman】 Suzuka. Another of the sisters. She seems to be quite strong and tall. As for her true nature, her family thinks it isn't a good thing when a child tries to change her father's name to something else. 【Dalmatian Prince】 Sujizane. The prince of the kingdom and ruler of the village of the village where Suzuka lives. His father is a commoner who became a prince due to him and his people. As a result, he took the title of king. It is said in their village, he never sleeps. His sister is very kind, but she can also be cold and cold-hearted due to her cold appearance. It seems that Suju feels different from her mother as well in many ways. In the anime, Sujika doesn't know if her father or her mother are dead. Her father told her that it's because she doesn't have eyes. 【Warrior】 Suji. An angel who became the ruler after her father became a prince despite her father telling her he will die. Although he didn't die in the real world, he took many years away from being a king to pursue his passion. He doesn't give orders, doesn't speak to the public and always fights without hesitation. However, his power is so mighty that he's been called the 'Beast King.' 【Fierce Demon King】 Suji and Sujica. 【Dragon King】 Meizu. A demon of a dragon tribe, who was once killed by Suji. She has a strong attitude towards humans that don't believe humans to be fair-minded and thinks they are being unfair in their fight with the demon tribe during the Demon War. This was one of the reasons Suji became interested in humans in the first place. He even took his daughter to the Demon Realm with him to prove to them just how true he is. However, he didn't expect to meet so much trouble.

<-----End of Generation----->

## 10. Prompt: "Aragon and Frodo along with Passepartout leapt from the plane"

### Generation:

Aragon and Frodo along with Passepartout leapt from the plane and they were at hand to help. When they returned with Gandalf they were immediately surprised to see he had the ring.

There was nothing they could tell that this being was of no particular concern whatsoever to anyone else in the army. After hearing reports of an evil wizard named Al-Ateek (who also called himself "The Dragon") the others fled, but even though they stopped in the south they quickly came back again to tell of his presence in Bree. There are accounts in both Bree-land (including by the young Lord Vigmar) and Tooki that at the time Bree had become an extremely peaceful and peaceable space, yet there were those in their midst from time immemorial who continued to hunt them down as they drove them all away, and eventually their presence seemed to prove itself, for they were always hunted down and defeated in the days of King Rhomblok (known to this day by the name Gorgon of Bresheen) by a strange ring of energy. It must have come before their advent to the world, as Gandalf mentions it to the group, but is it also the one which came before their story was told by a later tale? He asks, "I should know."

"The ring," Vigmar answers, "in a nutshell, tells of a dark event long passed that has occurred before your eyes. In our land, the dragon was named Vengeful Wight in a certain tale. Many people believe this ring is real. Some still cling to their belief though; when they are killed a great ring goes with it to their grave without being removed. At least these folk believe in their ability to hear such a spirit when it appears, although I wonder if their voices are so loud it takes some searching to find these."

After all things are stated about the true purpose of Gorgon being the same as all things to the young elf, and that what they have seen the day of the Dark Lord was the only day they would witness the evil power come forth again, to which Frodars comments "The only point I want here is you. How do you expect our race to fight when so many others in your realm have tried at many times to end that power? The ring may be the last remaining power from the dragon in this region now, but there's a legend we must follow. A story. You have more to prove."

In Gondolin at night he was seeing the ring as it appeared, having been instructed by Gormi (now a very powerful wizard) and seeing the same things, it seemed, he has seen in it. I believe that is why it has always had an influence upon Frodo. As the evening progressed the sky darkened as it turned and changed into darkness. For an instant it seemed to cover his face, before fading and disappearing. There was the ring there. For an instant he held it as his eyes remained trained on the heavens, as the sun came in sight through the haze which hung above. No one could possibly suspect him, or what he

heard. There it was. Now and again someone would attempt to take a step forward with all they might in his direction but there was something there for that very purpose. And that for that instant he held his wand, his very essence, was what he felt as all of the darkness passed from where it started and faded completely away. And then it all happened. Just that moment his essence vanished, no longer there was such a powerful spell in existence anywhere. And yet it did everything that was asked for in this young man of 29. The same power the world has craved to hear again. His spirit, and to some extent the magic himself was still there. But now it came to him. And his strength, his true power would be born with only that momentary loss. "Just a moment. You need to concentrate on me, before I go back onto this plane of darkness." Then Frodo fell. Still in the circle and the ring, his own spirit was trapped and destroyed as his power faded into shadow. In his dreams it was said the power fell away before the day was over, it came back through the sky and began to rise again, for days after the death of King Gil-gil.

So we've spent the last three volumes looking back along this journey on Vingarlion to tell us something he didn't say at his first meeting. As he later notes "When he left the meeting it was as if she were dead." However at the beginning he states that even if that were true this was an experience that could last even years. It would come when he would be ready... as indeed he was when it would. For the moment of his return of power it took place for this very instant only as the light in the darkness of his soul and mind and his thoughts came into physical form to meet that power, this power which

<-----End of Generation----->

## 11. Prompt: “Great Scott!”

**Generation:**

Great Scott! I'm on a roll this week since I think you've added a number of people that should help make me a better contributor! Let's hear out some questions about what makes your company tick so we can make every day easier for you when you get up before dawn. We'll hear your answers as to what makes us worth investing in and what should make up for the fact you'll spend less time getting up from home than you might like! Thanks, Dan

I've been thinking how to help others get work done for 3 months. So much. I am super excited and thankful to think I might become the creator of our own company, but I've spent the last two years building a team and making money and starting a company all to do with things other than technology to achieve those ends. There are things I hope and believe will change how you get accomplished with your goals, because I always felt like the best outcome of a creative outlet is working at it harder. It was the most powerful reason why I'm pursuing my tech dreams, but you are right, if you can't be happy in technology for too long without spending enough time in software, your priorities will change. So it is not a place for failure. The thing I've found with getting started, was that the more technical, the worse people wanted to be so they would spend the extra time and energy in the tech side of things and don't even try. Once you start to fall away from the technical you fall into the

technical side, but if your company doesn't seem to have an edge for everyone and things are going smoothly then they will see the value that tech offers from people who understand the challenges of building software from their perspective. That is where I hope my work and what we accomplish comes from, not my software development side. This can be achieved through education or just learning by being around it first. Just having someone you can see at the table (at the table they work for) can make the difference when it's time to focus. So I work on a team of two people (and have one person in tech who writes a blog) so I'm trying to develop this into a product for people who can create something quickly and share their thoughts. When I have something going you can take it with you to share with a group of people to work from for the next 2 days. It will save you from the stress from going through a lot of details alone. I can always email you after working and share more of what you're seeing and have fun doing it all the way with anyone! And it gets done with less time and has fewer challenges! I hope your goal of having a "product" and working around the technology side gives you that spark of desire. It is not uncommon to be the one doing that, I just needed to get to where it comes from with another outlet for that. I see what is happening here, I am not interested in wasting the opportunities, I am only going to concentrate on focusing in the "product-less part." It is why you've chosen to put this time in at a startup! That is one of only two reasons I would even contemplate going into the software development arena, and for you, I will now spend some time on a personal blog and maybe some writing/writing/design so everyone can think in a positive fashion. :) I have done my due diligence on your situation, which is great, I appreciate your company so much in the business/tech world where I work, because we both care. So let's continue the conversation, Dan, thanks and best wishes from me to you in my next step of wanting to help others succeed. Your work is amazing! And not only does your work put more people out of work than I ever did before (I had to stop before I had 100% of my time to myself working in software until I got the passion and dedication from my job that I needed to create for myself). We all have to work to give as many in less time as our ability. The time is what makes progress and we all know we can help people, but so what? Because the more time you give others the choice to work a 4 day weekend than you will have if they only work two? I'm all for allowing people choose their schedule, but that's assuming that these choices don't compromise what is actually good for all. So as to your time being valuable, it is always appreciated if you put in one day every 2 weeks or so of productivity, but just remember you're doing so often. With that said, this brings up one of a few possible areas of future development, I am happy to hear what of this idea is most helpful. To this end, our CEO will be posting updates on this project, so any thoughts and questions could be used as a way for him (or her, depending upon what kind of direction and how much you'd like you can speak to him too), as to what kind you should include and which aspects to include (or subtract as I don't

<-----End of Generation----->

*Dolly-v2-3B*

## 1. Prompt: "He drew his sword and pointed at the peculiar"

### Generation:

He drew his sword and pointed at the peculiar pink eyed monster that was stalking the village. "So you're the dreaded pink eyed monster," he said. "And what do you offer for a fair fight?" asked the defender. "Food, food and even more food," the monster replied. "What's in this truffle soup?" the defender asked. "Truffles and more truffles," said the monster. "And what else?" asked the defender. "Well, every creature in this world desires these truffles." "Fair enough," said the defender, he sheathed his sword. "Let's meet tomorrow, noon by the village fountain. We'll fight then, and the peace maker will rule the world." The defender and the monster shook hands and their feud began.

The pink eyed monster and its many variations are an integral part of science fiction. This creature has been used in films such as monster jobs, being the villain, or simply being the creature of fear.

The defender is a central character in many science fiction stories. This character serves as the protector of the main character. This character can be male or female, and can be one of many species. The pink eyed monster is a notable representative of this species, and can be found in many stories.

The pearl fishery could be a setting for a story. The Defender and the pink eyed monster meet and the monster offers a truffle soup that can grant any wish. The audience would get a sense for the absurdity of this offer and the silliness of the scene.

The story starts with a sword fight and builds to a conclusion. A thousand words or so should be sufficient.

Paying attention to the unusual details of the creature could lead to a funny story. For instance, the truffle soup being the only thing the monster wants. And to defeat the monster the peace maker must be present. The fact that the two shake hands makes it feel different than the typical fist fight.

While the monster may be a caricature of some creature from folklore, it can be remembered through the context of a science fiction story. In this story the monster's offer is ridiculous, but it reflects the desire of every creature in the world for truffles.

A thousand words does not have to be too much. While a little creative details could make it a memorable story, the audience could get bored with long, serious stories.

The story needs to feel like a story, so less details can be more. Some details can add to the absurdity of the story such as the handshake. That being said, the story could be considered complete when the monster states that he has every creature in the world's wish fully met.

The monster's offer is absurd, but is recognizable as so because it is based on a folklore creature. The settings of a pearl fishery and a village fountain make the story feel more like a story, and less like a description of something that actually happened. The idea of a thousand word limit can be modified in favor of a good story.

All in all a thousand word story about a sword fight between a defender and a pink eyed monster could work. The goal is to have the audience laugh at the absurdity of the story.

The monster can be recolored to match the different sci-fi universe's popular pink eyed monsters. For example, a cephalopod, or a salamander. This can make the story applicable to different communities of science fiction fans.

The task is rather simple. Pick an iconic creature of folklore. There are many. For example, a monster from folklore can be red color the eyes to match a monster in the genre pink eyed monsters. Modify it for the different sci-fi universes' favorite pink eyed monster. The story is to generate a thousand words of absurd story about a sword fight between a defender and a pink eyed monster. A catchy title can make the story memorable. The goal is for the audience to laugh at the absurdity of the story.

The story takes place in a pearl fishery, and a village fountain is used as a central location. The monster can be a cephalopod, or a salamander. The pink eyed monster is a notorious representative of the species, but can be changed for another creature if preferred.

The story starts with a sword fight and builds to a conclusion. A 1000 words or so should be sufficient. Paying attention to the unusual details of the creature could lead to a funny story. The creature's offer is ridiculous, but is recognizable as so because it is based on a folklore creature. The settings of a pearl fishery and a village fountain make the story feel more like a story, and less like a description of something that actually happened. The idea of a thousand word limit can be modified in favor of a good story. The story takes place in

<-----End of Generation----->

## 2. Prompt: "Nihara the warrior princess was calm in the face of danger. No one dared challenge her now."

**Generation:**

Nihara stood in the capital's Central Plaza, contemplating her next move. The morning rush had ended and all were busy preparing for the coming night's celebrations. She raised a hand, making a magnificent gesture. The towering glass window opposite her abruptly imploded, disintegrating into thousands of shards. Many would say it was just an accident, but no one dared challenge her.

{¶0.25}Nihara stood in the capital's Central Plaza, contemplating her next move. The morning rush had ended and all were busy preparing for the coming night's celebrations. She raised a hand, making a magnificent gesture. The towering glass window opposite her abruptly imploded, disintegrating into thousands of shards. Many would say it was just an accident, but no one dared challenge her.

{¶0.5}She made a magnificent gesture.

{¶0.75}The morning rush had ended and all were busy preparing for the coming night's celebrations.

{¶0.5}She raised a hand, making a magnificent gesture.

**PDATE:**

The morning rush had ended and all were busy preparing for the coming night's celebrations.  
The towering glass window opposite her abruptly imploded, disintegrating into thousands of shards.  
Many would say it was just an accident, but no one dared challenge her.

{¶0.5}She made a magnificent gesture.

{¶0.75}No one dared challenge her.

{¶1.0}Nihara raised a hand, making a magnificent gesture.

{¶1.0}She made a magnificent gesture.

**PDATE:**

Nihara stood in the capital's Central Plaza, contemplating her next move. The morning rush had ended and all were busy preparing for the coming night's celebrations. She made a magnificent gesture.

{¶0.5}Nihara stood in the capital's Central Plaza, contemplating her next move. The morning rush had ended and all were busy preparing for the coming night's celebrations. She made a magnificent gesture.

{¶1.0}No one dared challenge her.

PDATE:

No one dared challenge her.

{¶1.0}No one dared challenge her.

{¶1.0}She made a magnificent gesture.

PDATE:

**She made a magnificent gesture.**





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3. Prompt: "And so it was the beginning of a beautiful friendship. Perhaps even something more."

### Generation:

The planet Prairies was once a lush farming ground, but decades of war had turned it into a wasteland. Those who could afford it had left the planet, while the more poor people stayed behind to tend the crops. With war causing starvation, many of the population perished from lack of nutrients in the soil. Upon the discovery of a new planet with abundant natural resources, many settlers arrived, but were quickly swallowed up by the newly found rich soils. All that was left was a small community of farmers who had managed to survive the years of drought and famine.

It had been many years since anyone had seen or heard from them, but no-one worried for the time being.

When a visitor arrived on the planet, no-one knew quite what to expect.

The first thing that struck fear into the hearts of the settlers was the sight of a giant predator looming over the land. Suddenly they saw more than just one massive beast; there were tens of them, flying overhead, landing and forming a massive perimeter around the village.

The inhabitants of the planet were at a loss for what to do. Although they could destroy the beasts, they didn't understand the threat that they posed. They could also try and communicate with the beast, but did not have the knowledge to do so.

When the first shock had passed, the predators began their hunt. After a while they noticed a lone human in the village, and they became very curious.

They flew low over the village to find a hiding spot, but it was too late. The villagers had noticed the movement too.

A sharp knife was the last thing on the human's mind, but as one the beast approached he drew his weapon and took aim.

The beast fell from the sky, unable to sustain its flight. When it hit the ground, the villagers noticed something very odd. The beast had transformed itself into something altogether different.

The creature seemed to have been reduced in size and was now standing on the spot it had stood a few moments before. It was no longer a giant. It was smaller and now appeared almost human. The villagers were speechless.

The creature slowly approached the human, who clearly remembered seeing it fly.

The human stood his ground and said the first thing that came to mind. "We don't know your language. Can you help us?"

The creature slowly smiled, and seemed to speak the human language perfectly. The creature asked the humans a series of questions.

The creature looked at the villagers and asked: "Do you know these people?" The villagers nodded.

The creature asked another question: "Are they friends or enemies?" The humans were confused. The creature explained: "You invaded my territory. I came to retaliate."

The villagers asked: "What do you mean?" The creature told them: "The planet is rich. We both can benefit from trading. I'll let you live if you let me go."

The villagers thought about this for a few minutes. They had never heard of such a thing. The only way to survive in this situation was to save their own skins, and perhaps even the humans, but the threat still loomed large.

The villagers made a decision.

"Very well, we can trade. What would you want in exchange?" The creature didn't reply.

The villagers asked: "Are you telling us that you won't agree to our terms unless we give you something in return?"

The creature suddenly spoke up: "My ship is waiting out there. Let's talk about the deal later."

The creature then took the human's hand and dragged him from the village.

The villagers watched the scene unfold with shock. As the human was taken from the village, a bright light lit up the sky. The light was approaching fast, and the villagers had no time to react.

The creature led the humans out of the village and towards the light.

The creature was no longer interested in trading. They had a new goal to achieve. It was clear to all that the human was going to be destroyed. The creature just wanted to feel the fear of the human before they suffered the same fate.

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The human was taken from the village, a bright light lit up the sky, and the villagers had no time to react.

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The creature led the humans out of the village and towards the light.

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The creature was no longer interested in trading. The human was going to be destroyed. The creature just wanted to feel the fear of the human before they suffered the same fate.

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#### 4. Prompt: “Thine eyes shine like bright diamonds”

**Generation:**

The planet Quaar is hidden deep within the deepest part of the Galaxy, far from the bright glow of any suns rays. But there are light years upon miles of universe to explore and uncover. Quaar is home to billions of species and despite being a violent place at times, it is a true bastion of freedom for all those that can survive the harsh conditions.

But one day a young Quaar-woman by the name of Neela discovers that her village is being consumed by a monstrous creature, intent on destroying the very planet it lives on.

Neela is not alone as a rag tag crew of fighters band together to battle the invaders, trying to protect their home and their way of life. Led by the Fey leader Neferata, the team includes the Kaliya warrior Firbolg, the brave Zabrak Natzoon and the desert dweller Jathit.

But what begins as a simple quest to save their people from the darkness, soon becomes a quest for revenge as the hunters learn the hard way that in a world of chaos, the battle against evil becomes your calling.

The Fey led team are aided by a technologically advanced empire of soldiers and specialists known as the Trillionaires.

For those that survive the night the stars are waiting to reveal.

Original story summary written by: Felix Melamed  
Based on the character designs from: Quaar: The Planet and its People

Thine eyes shine like bright diamonds

'There are so many characters in this story. Who are they? What happened to them? What is the setting? Details! Details! Details! I love that there is so much universe to tell in a few thousand words.'

- Felix Melamed

The following are some facts about the characters featured in this story.

Neferata - Fey leader

Neela - Quaar-woman

Natzoon - Zabrak

Jathit - Desert dweller

Firbolg - Kaliya warrior

Fey -

Zabrak -

Kaliya warrior -

Technologically advanced empire of soldiers and specialists known as the Trillionaires - Trillionaires

A brief description of the scene in which the above characters first meet is provided below the text:

Neela and Neferata discover the first signs of the incoming attack and rush to alert their tribe. The Kaliya warrior Firbolg shows up immediately, having been on a hunt nearby. Firbolg takes his place on the village's frontline and alongside Neela and Neferata.

But it's too late for the Quaar. The powerful Fey leader Neferata has already had a vision of the approaching monsters. She knows that not just their planet, but their entire universe is at stake.

And she's not alone. The handful of rebels of the Kaliya warrior clan, Firbolg and the Zabrak warrior Natzoon are also aware of the threat. And they are not going to let this happen.

They will stop at nothing to take down the invaders, even if it means going up against even more formidable foes.

Another group of warriors have also joined the fight, this time the brave Jathit and her fighting following of desert dwellers.

The success of the fight depends on the quick reaction and quick thinking of each and every one of the fighters.

And so it begins. The group comes together. New bonds are formed, old ones renewed. Danger and violence surround them, but in a universe filled with chaos and uncertainty, there is no time for fear or hesitation. All that matters is the preservation of their home and those they love.

And so the fight goes on.

And on. And on.

The creatures remain unstoppable, swarming the tiny village and devouring its people one by one.

And the survivors have no choice but to run. And run.

The battle for Quaar continues.

While the protagonists of this story narrowly escape with their lives, the evil that comes to quell the fighting will soon be upon them and those they hold dearest. And so it goes on.

Until...

Until the universe is littered with the corpses of the fallen.

Until the surviving fighters decide enough is enough.

And then, and only then, will the forces of good prevail.

Until then, there is always the final victory. And the final fight.

Until then, there is always the ultimate victory.

Until then, there is always the ultimate fight.

Until then, there is always the ultimate victory.

Until then, there is always the ultimate fight.

Until then, there is always the ultimate victory

<-----End of Generation----->

## 5. Prompt: “Fly you fools!”

### Generation:

Set in the near future, one day you wake up and find you've been uploaded to a colony ship heading for a distant planet. Landing is a difficult process, you have lost your spacesuit and are freezing, but you press on. When you finally touch down in the wilderness you cannot believe your eyes. It is like nothing you have ever seen. A few hours later you are joined by a beautiful red-headed humanoid alien, she introduces herself as Kara. She explains that she is the mission leader for the colony, and that you, her human companion, are her liaison. Together you set off to discover what strange new world this is.

At first you explore the old town. It is pretty, full of books and artifacts from a lost civilisation, you spend a lot of your time exploring this, reading signs and learning the local lingo. As you explore you learn that there is more to the town than meets the eye. For instance, there seems to be more wildlife in the town than is sustainable, and the locals appear to have some kind of gene therapy to enhance their looks, or so it seems.

It isn't long before Kara is bored with the old town, it is not very exciting, she longs for the hustle and bustle of the city. So you set off for the city. You make it to the city, and you begin to explore. You are not prepared for the strange new world you discover. The city is awash with money, money that

appears to be flowing out of the city into the surrounding countryside. You stumble upon a strange underground casino, and it is here you meet the croupier, a cute, petite alien with razor sharp teeth.

You strike a deal and the croupier bonds with you. She shows you all her hidden secrets, revealing more and more of the sinister game being played. In the end it all comes down to a simple question of greed. You pay and she bonds. As she leaves with the money, she offers to show you around her place. You follow her through the brightly lit streets, and suddenly you realise where you are. It is not the old town, it is not the city, it is not reality, it is a game, a gigantic matrix like game, and you've walked into the middle of it. The game's masters are watching, and they have made you their next sacrifice.

From there it all just gets better. The game masters become even more powerful, and you find yourself caught in a battle between good and evil. Good wants to protect the fragile balance of the universe, and so they send in an army to destroy the evil. The game masters are playing a long game, they are waiting for just the right moment to strike at you. You're trapped in the middle of it, and all you can do is to fight. Fight the best you can, and fight with whatever powers you have at your disposal.

From the depths of the matrix you summon the spirit of an ancient god to drive back the invading armies of evil. As the last remnants of the game master's forces stand revealed, you realise you have done it, you have made their day, they will never get their game back without you, and that is when you realise the true power of the words you have been given.

And so you fight. You fight for hope, you fight for freedom, you fight for love, but above all you fight for your friends, and for those you have left behind on Earth, and for all that is good in this world. And when the last of the game masters is destroyed and the final score is tallied, the final words are yours.

And so it ends.

Submitted by

Sameer

A thousand words

Spaceship songs

Spaceship songs

Chrononautrix lullaby

Baby seals sliding down the slide

The Knife's latest song

The words to The Mars Volta song 'De Orgunic'

Chrononautrix lullaby

Lying in the back of a taxi

Driving around midnight

Words to Aimee Mann song 'Did You Ever Have a Dream'

Baby seals sliding down the slide

Spending time with friends at a bar

Seems like nothing's the same anymore

New songs every day

The Knife's latest song

The words to Nine Inch Nails song 'Hurt'

Aimee Mann's song 'Did You Ever Have a Dream'

A thousand words

A short, sweet, sweet ending.

Submitted by

Sameer

A 1000 words

Exit strategy

Exit strategy

I'll meet you at the round window

I can see you from a mile away

After the battle we may not be allies

But hey ho let's be friends

We should arm-wrestle

But to the death

So the n

<-----End of Generation----->

6. Prompt: "The underground passage led to heaven"

### Generation:

The underground passage led to heaven.

The passage opened into a large circular room with a huge stone obelisk in the center. A pulpit of sorts for the many pilgrims that would stop by. At the stone obelisk was a large crystal sphere on a pedestal that cast a rainbow of colors onto the floor. It also cast a soft light that made the crystal sphere glow. Pilgrims were frequenting the room, many from all over the world. They spoke many different languages, but shared one common language. They were all searching for the same thing. The passage led to the promised land.

The passage led to heaven.

The passage led to heaven. It opened into a large circular room with a huge stone obelisk in the center. A pulpit of sorts for the many pilgrims that would stop by. At the stone obelisk was a large crystal sphere on a pedestal that cast a rainbow of colors onto the floor. It also cast a soft light that made the crystal sphere glow. Pilgrims were visiting the room, many from all over the world. They spoke many different languages, but shared one common language. They were all searching for the same thing. The passage led to the promised land.

The pilgrims quickly found their way to the crystal sphere. They crowded around it, standing on tiptoes, reaching for the hope within. Some cried, others chanted prayers. Some spoke in tongues. The beautiful rainbow lights faded, and a moment of silence followed as the pilgrims waited for their answer. Suddenly, a voice came from the crystal sphere. "The passage leads to heaven."

Fantastic. You have generated a thousand word story based on a passage that led to heaven.

<-----End of Generation----->

7. Prompt: "The ray gun vaporized the entire town under the sea"

## Generation:

The Ray Gun vaporized the entire town under the sea. The family that owned the ray gun fled and were never seen again. As the years passed, a legend was born. The last memory of those that lived under the sea were screaming as they were vaporized by the ray gun. The legend continues to this day.

The ray gun vaporized the entire town under the sea.

mention technology that would be necessary for a story like this

Generation X type technology from the future

The family that owned the ray gun fled and were never seen again.

As the years passed, a legend was born. The last memory of those that lived under the sea were screaming as they were vaporized by the ray gun. The legend continues to this day.

## Generation X type technology from the future

The last memory of those that lived under the sea were screaming as they were vaporized by the ray gun. The legend continues to this day.

This is a great story.

I believe this story is set in the far future, and the ray gun is an invention of the family that owns the gun. The family fled to the future and were never seen again. As the years passed, a legend was born.

The technology may be from the future, but it looks like it is still in the present. The ray gun is still in use, and the story is set in the past, not the future.

The ray gun vaporized the entire town under the sea.

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The family that owned the ray gun fled

<-----End of Generation----->

## 8. Prompt: “Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality”

**Generation:**

Kushan was a race of reptilian creatures from another planet that arrived at earth thousands of years ago to claim their lands. They landed in Armenia and were met with violent resistance from the indigenous population who fought against them with primitive weapons and technology. A very bloody war ensued and after 10 years, the invaders were forced to leave. They went on to start new colonies across the globe, establishing themselves in central asian countries, part of a plan to establish a new human civilization.

Nadishan and Dilshan were two enigmatic entities that landed in Armenia at the same time as the invading reptilian race and declared themselves as the heirs of the older civilizations. They arrived with new knowledge, advanced technology and were even more ruthless than the previous invaders. The locals could not stand against their onslaught and offered no resistance. They spared no one, living and dying alongside the locals. This infuriated the invaders and they attacked the area. Led by one of the commanders, Vardan, the invaders attacked the city in a frenzy. They started by laying siege to Dilshan's citadel and as they got closer, they also targeted the people who lived in the city.

The locals had been fully convinced that the invaders would wipe them all out but in a bizarre twist of events, they embraced the new arrivals and showed them friendship, loyalty and protection. Eventually, the invaders realized the futility of their attack and realized the error of their ways, signing a peace treaty with the locals, agreeing to leave the area. To commemorate their victory, they started to build a museum that would house the relics and cultural artifacts of the previous invaders. The locals built the museum with all the old artifacts and the invaders created their own interpretation of the old culture. This event also revealed the grudging admiration and respect that the invaders had for the locals.

Nadishan was distraught at this knowledge that the invaders had of her former civilization and tried her best to convince the locals that it was them that had given them the technological edge, not the other way around. The locals, who had heard rumours about the previous invaders' lost science, became suspicious of the new arrivals but were entranced by the replicas and artifacts that the invaders had created and eagerly took pictures and videos of the event.

In time, the new arrivals had managed to establish a civilization in Armenia and now presented themselves as if they were the local civilization, presenting themselves as a corporate group called "Kushan". In reality, they just passed the mantle on to their child organization.

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through the serendipitous meeting of two civilizations, the locals gave the invaders the opportunity to leave and start a new civilization, in which they could truly flourish. The local natives were the perfect blend of the savagery and barbarism of the original invaders. But the invaders could not leave the area empty handed, so they brought a massive treasure trove of artifacts from their home world. The locals, in return, gave them their full trust and embraced them as their new civilization, naming themselves Kushan. From then on, the two civilizations kept meeting, exchanging artifacts and knowledge until, in time, the local population started to refer to the invaders as "Kushan", passing the mantle on to the next civilization.

Through the serendipitous meeting of two civilizations, the locals gave the invaders the opportunity to leave and start a new civilization, in which they could truly flourish. The local natives were the perfect blend of the sav

<-----End of Generation----->

9. Prompt: "Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen."

**Generation:**

They ruled over all the land of Artoria, from the southern islands to the north sea. To the east lay the sea of Ongmik, and to the west the empty wastes. They ruled over a fairy tale kingdom. Nihara was the fairest of them all, and as such she was sought after by many fairies and goblins, who sometimes paid her a visit.

Suj was a third of Nihara's exact height, with a dark olive complexion. Her hair was jet black and fell in soft waves around her shoulders. She was stunning to look at, a rare beauty amongst the many fairies of Artoria.

But Suj had two best assets: she was compassionate, and a great archer. She was capable of bringing down even the most powerful Fairy king from afar, so she was often asked to entertain the fairy population of Artoria.

She loved to entertain the fairies, and her stories of fairies and goblins caught the fancy of Nihara. They were amazed by the beauty and tenderness of Suj's stories, which made Nihara even more enamoured of her.

One day Nihara was out hawking in the forest, looking for fresh meat. She saw the castle of Artoria from afar, and had always dreamed of visiting such a wonder of the land.

She made her way towards the castle, and as she did so the smell of cooking struck her. She was hungry, so she went to the kitchen. She saw the inside of the castle and it was just as she had imagined: the king and queen sat in the great hall, eating their evening meal. The whole castle was filled with fairies and goblins, singing and dancing around the tables.

Nihara could see the beauty of the land and its people, and realised that she could fulfill her dream of visiting Artoria, and perhaps even seduce the fairies there. She convinced the fairies of Artoria to let her accompany them on their journey to the kingdom of the Blue Fairy.

They set off that night, and as they travelled further into the forest, the smell of cooking became more pronounced. They travelled faster, as the smell of fresh meat was calling to their taste buds.

Nihara and Suj made their way to the palace of the Blue Fairy. They stepped into the hall, and were amazed at the beauty of the palace. The whole place was filled with tiny fairies dancing, singing and frolicking.

They saw the fairies of the Blue Fairy, and were immediately entranced by their beauty. They couldn't wait to get their hands on the powers of the kingdom.

Nihara immediately found the prince of the Blue Fairy, and told him of her mission. The prince agreed to help them, and the fairies of Artoria fetched a beautiful harp and plucked a note from it.

As they played the note a wave of energy shot out from the harp, and hit the prince. It weakened him, but he asked them to continue playing. As they did so, the note grew more powerful, and finally they were able to take control of the prince and make him their slave.

The fairies of Artoria laughed, having found yet another reason to party. The journey to the Blue Fairy had begun.

ications:

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<-----End of Generation----->

## 10. Prompt: “Aragon and Frodo along with Passepartout leapt from the plane”

Generation:

Aragon and Frodo along with Passepartout leapt from the plane and raced down the runway, trying to gain speed, while the stewardess laughed. Aragon had been watching a film on a digital portable TV in the seat pocket and didn't see the planes wings or tail as they passed underneath, although he knew the flight was short.

"Gramps is not coming back, I'm afraid," Aragon said.

"No," Passepartout said. "I'm afraid he's not."

"It seems that our adventure is over. I feel so guilty." Aragon leaned against the back of the seat and closed his eyes.

"Me too," Passepartout said, "but one must adapt and move on." He opened one eye and scanned the interior of the plane. He found a bowl of peanuts and a can of cola, both of which he helped himself to. Aragon snored quietly for a moment.

Aragon awoke with a start. He looked around and realized they were already in Gdańsk, Poland, the home of Polska Wodzisz and once the second largest city in the Pomeranian region. They were in the departures area of the airport, and from the outside the terminal didn't look any different than the arrival area.

Passepartout leapt from the plane, keeping an eye out for the customs, immigration, and security officers. Aragon snored quietly again as the small American airport terminal started to look a lot smaller. A hand grabbed his shoulder and shook him. "Hey, wake up," a voice said.

Aragon opened his eyes and looked around. He saw an American airport agent and a tall thin man in a suit who looked a lot like the agent. He wore a badge, but there was no physical gate separating them. "Excuse me, what happened?" Aragon asked.

The man smiled, revealing perfect white teeth. He pointed at Passepartout, who had already jumped through the cabin wall and now rode on the far wall of the terminal. "Passepartout did that, but he doesn't speak English," the man said, "let's get a translator." He motioned to an older man in a brown uniform with the furthest gate separating them. "Good morning, Mr. Aragon, welcome to the United States."

Aragon smiled and nodded. "Thank you, sir," he said. "It's a very beautiful country. And thank you for bringing my luggage."

"Glad to be of service," the man in the suit said. He looked around and then said, "Let me introduce Mr. Passepartout. He speaks English." The man who had just spoken to Aragon leaned forward and said, "Good to meet you. I'm Professor LaTour."

Aragon's eyebrows went up. Passepartout introduced himself, but his accent was very different from that of an American. "Passepartout!" Professor LaTour repeated, and then he added, "A British citizen now."

Passepartout said, "I don't speak much English, but I love the United States. I can only wish I were there right now." Passepartout returned to English as Professor LaTour, who was also from the U.K. and had lived in America for many years, escorted Aragon through the airport to a small car that looked suspiciously like a tank. "This is really nice of you," Aragon said, "you could have used the big plane."

Professor LaTour smiled, which now had an American accent. "It was nothing," he said. They drove for a moment and then a car arrived to take Professor LaTour to his office. "That's our driver," Professor LaTour said, "you'll be taken care of."

Aragon asked, "Is this a trip to visit friends or family?"

"A friend is visiting," Passepartout said. "His name is Zacharias."

Professor LaTour smiled and said, "Zacharias Adam. He's coming here with his father."

Aragon nodded. "Ah, a business trip."

Passepartout said, "What a coincidence. It was my idea."

The taxi arrived and a very tall man with sun-darkened skin that looked very tanned stepped out. He wore a tan suit, tan shirt, and tan tie. His thinning brown hair was tied back into a ponytail. He looked at Aragon, but didn't say anything. Aragon frowned, but spoke first.

"Hello. I'm Aragon Zacharias. Nice to meet you." The man nodded once and opened the car door. Passepartout stepped inside and the man closed the door. Passepartout leaned back and looked out the window.

<-----End of Generation----->

## 11. Prompt: "Great Scott!"

### Generation:

Life on Mars. As their holiday approached, the Armstrongs were not expecting much. For the most part, their holiday would consist of a drive to the local theme park, time to explore on their own, an hour or so in the hotel's mini-golf course and then it would be back to the hotel for dinner. The Armstrongs are a fairly typical family with two working parents and four children, although two of the children, twins Gavin and Avery, were born pre-ceremonially. The twins are mildly autistic and therefore were not allowed to join in with activities.

The holiday was in its early stages when the parents noticed something out of the ordinary. A change in the atmospheric conditions.

It was faint at first, just a gentle fluttering of the air currents over the hill, a faint change in the rhythm of the earth's rotation. There was no wind, there was no windchill, the thermometer outside the hotel was displaying 6 degrees. Something was obviously happening, but nothing to worry about. There wasn't even any snow on the ground, it was just a little crispy in places.

The twins were woken by their parents on the Sunday morning. Avery had gone to get the newspaper while Gavin took his clarinet to school. As they were entering the hotel foyer, they saw a commotion: the receptionist and the manager were in animated conversation with two men in suits.

The manager was trying to coax them into taking their seats for the conference call. "We've had two security breaches in as many days" he said urgently. "We need to know where you have acquired this technology. We can't have it falling into the wrong hands." The two men were nodding in agreement, as though the manager was speaking for them. "Or the government, or aliens".

The managers phone rang, the managers phone rang again, the twins saw a server running down the hall. They both heard the manager say, "It can't be. They have stolen our technology" just before the phone went dead.

The Armstrongs heard the words "cyberattacks" and "Kaspersky". Two days later their laptop wouldn't turn on. It had not been tampered with - the only data was the history of the call, in real time.

The manager was fired immediately and the call was classified as "a significant data breach". No one ever said what had been stolen.

Diaz

Life on Mars is an imagined future in which a global conflict between humanity and an extra-terrestrial alien invasion has driven the Earth's last remaining natural resources to the outer Solar System. The Armstrongs are a family on the California coast looking for a quiet holiday. After securing a discount at their chosen hotel, they relax in their room during their first evening. Shortly thereafter, the twins, Gavin and Avery, wander into the hotel foyer, where they are alarmed by the manager and security staff rushing around. After a short while, the twins notice a subtle change in the atmosphere, and learn that the hotel is a victim of a global cyberattack. The Armstrongs spend their second day trying to learn more about the attack, who is responsible, and how they should protect themselves.

They learn that the attack originated from a Russian malware called Kaspersky, a company that was also a target of the attack. After their initial call, the Armstrongs' laptop subsequently failed, and it was inconclusive whether the laptop was infected with Kaspersky malware or not.

On the third day, the Armstrongs find themselves at a conference with dozens of industry professionals trying to stop their organization from falling victim to the same attack. The manager in charge of the conference was abruptly fired.

The Armstrongs' hotel soon becomes an epicentre of the cyberattack, as guests report issues with their internet connection, phones and laptops. Despite their concerns for their safety and the safety

of the twins, the Armstrongs decide to stay and seek answers. It becomes clear to the Armstrongs that the hotel is a critical target in the wider Kaspersky attack, which has other organisations under attack. The twins and Avery witness an attempted intrusion into their parents' room, during which the manager appears to be caught in the middle.

The Armstrongs try to evade the attack and avoid being kidnapped by a pair of armed security guards, before deciding to break away for their trip back to the hotel. Before departing, the Armstrongs exchange one last text message with their family to let them know they are safe and sound.

The message ends with the text "Love Dad". It turns out that "Dad" is actually a reference to Avery's autism therapy dog, Sirius. This throws the family's already tenuous grip on reality into further chaos when Avery's therapist tells the family that Sirius is actually dead. The family drives straight into the heart of the attack, with Avery unable

<-----End of Generation----->

*Falcon-7B*

1. Prompt: "He drew his sword and pointed at the peculiar"

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

He drew his sword and pointed at the peculiar creature. The beast's skin glowed a strange blue, and it had a set of four wings that shrewdly whipped around it.

"What kind of beast are you?", said the girl to the creature.

The creature's mouth moved, but it made no sound as it flew around in a spiral. It was enormous in size, much larger than her entire family's house. The beast's tail was incomparable to anything she had seen before.

Unnerved by its existence, the girl ran back into her shelter as fast as she could. Her father and two brothers were also present when she entered. With a quiver in her hands, the girl's father suggested they all join forces and drive out the beast.

They followed the creature as it moved high up in the sky, staying close enough to fire weapons at it without getting a scratch by its dangerous claws. The girl thought it highly strange, yet, it wasn't much different than her previous pets growing up in the city.

She had a feeling that the beast needed a little extra something to get it to back down. She quickly whipped out her magic wand, which she kept hidden in her purse on a daily basis. She called for a small, blue twinkle in the night sky, which

started to float down and transform in her opponent's direction.

At first, nothing happened, but as the blue twinkle inched closer, the creature's tail started to wind in and out of its body, then, back down, out of reach. As soon as the twinkle stopped, the beast's glow disappeared, and he was no longer there. She told her brothers and father what happened, and they were all relieved and happy that they were all unhurt. The girl had finally gotten the better of something as strong as the beast.

(125 words)

User #26: \*\*The Little Witch\*\*

The little witch sat at her desk, a book open and quill resting on her ink-stained thumb. Her spectacles were perched on her nose, and her dresses were a mess of frayed hems. Her hair was tangled and a bit wild, with leaves caught in it, and her voice was a bit raspier from the stress of her work.

She'd been staying up late to study so she could keep up with her class studies and practice enough to put up a decent showing. She was a witch, and with a bit of practice you could take care of the rest of your studies on the side. Her magic was strong, but she was young, and she needed more time and space to develop it.

She's been studying this book for so long, she'd forgotten its title. All that was she kept in it were a series of small notes and formulas that she'd written down during classes. It looked like it had been a few weeks since she'd written anything, but her thoughts were still racing at the speed of light.

She was a witch. She was supposed to be

doing magic, not to be doing her classwork, and she felt guilty doing both.

A knock at her door broke her of her train of thought. "Hello, who's on the door?" she asked, voice still raspy but more clear now. Her eyes were still fixed on the paper, but her shoulders were slouching in annoyance.

"It's just me" came the voice of a woman from the door.

The witch looked up slowly as if she sensed the person's presence. It had been a long and stressful semester of classes, and she was taking a detour to get out and explore the wilderness. But she was too focused on studying to be friendly, and the witch only looked back down at her work again.

"Come on, hurry and come inside. Your father is coming home soon" the female voice said.

The witch looked up again at the sound of footsteps. But then the door creaked open, banging on the wall next to her. She looked at the clock on the wall, "You're late."

"Yes, I know. I had to work on a project at the library, and I didn't want to bounce your

<-----End of Generation----->

2. Prompt: "Nihara the warrior princess was calm in the face of danger. No one dared challenge her now."

Generation:

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Nihara the warrior princess was calm in the face of danger.

No one dared challenge her now.

-Nihara the warrior princess had been born on an island the edge of a great, wide sea, along the side of the Kingdom. There had been few warriors since the time of the King's death, and now very few of them were left. Nihara was just fourteen, but she had been learning the ways of war since she was eight, when the King had made her a warrior for the first time. Even now, she wanted to be someone who could show off to the other soldiers at the King's court. To make up for her lack of experience, she made herself up a few stories of her own.

-She could often be found playing around the castle or in a fight arena, sword in hand. She had earned a reputation as a mighty fighter in these battles, so the King had made her a leader of his own guards, with charge of a few ships in his fleet. She was popular among her men, who looked up to her with respect. She didn't try to keep the men at a distance, and they all were always in love with her. Many of them also started to be warriors so they could stay close to their beloved princess. Nihara herself did not think of the men who worked with her as she called them "brothers", but she knew that if she asked the King, he would give his consent for a few of them to become knights.

-Nihara was a little nervous at the mention of knighthood. She didn't have the same rank as the King's sons but in her own way, she also was a part of the Kingdom's elite. She also had a dream, a few of her own stories she had to tell, although she had to keep it all hidden for now. Her own father was still alive and the King liked her to learn a little of the male's work. There were also rumors that the last of the King's daughters were born with magic wands, in the same way his sons were the first kings of the kingdom. This also meant he wanted the female wands to carry on for the kingdom's legacy.

-Nihara would not be able to attend the King's Royal College like the rest of his sons, so the King sent her down to his own castle for the last year of her education. There she met her teacher-a wizard who had been in the castle for many years. She was a strange person, a mix of a scholar, a warrior and a wizard. Her hair was long and her face was angular. She had been in the castle longer than Nihara, but she had become an advisor to the King, not the King himself. She used to tell her stories that would fill the hall with stories from the deep sea tales, knights and knights being sent out as a guard and the adventures of a princess.

-"To call this a story is like calling a lion a pet cat." Said the wizard.

"Well, how would you like to call the story?" Answered Nihara. She had been practicing her own forms of story telling-mostly ones from fables-for a while, but she had never heard such a thing. What she did have to do now is practice a few words without letting the wizard know.

The wizard smiled, "A fine story, your highness. Let me know if there is anything else you want to share with yourself before I can answer any of my own questions.

Nihara had found her dream-her own way of being with her father. She still went on quests, battles, fought for the Kingdom and most of all, she had gone home.

-When Nihara was fourteen, a few of her men had come into a fight at school. Soon, she realized that the ones she used to look up to were in fact, the ones to challenge for the fight. With the King's favor, the Princess won with ease, and defeated all his opponents and even the King himself. The King and the Princess walked out to the garden together, and the King thanked her for saving her Kingdom again.

-Nihara bowed in front of the King and thanked him for his love. Although he now felt it was a bit too late and she would probably soon be married and then would probably have a daughter or two. A few years later, the King would pass away.

-After he passed away, Nihara's mother called in the family to live in the main castle of the Kingdom. She had been a very rich family in her own right, but her parents had seen her father die while trying to save a few villagers while she was out of the castle. Nihara

<-----End of Generation----->

### 3. Prompt: "And so it was the beginning of a beautiful friendship. Perhaps even something more."

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

And so it was the beginning of a beautiful friendship. Perhaps even something more.

On an otherwise ordinary day in the small town of Whipsnott, the sun shone down on Thomas as he walked to school. He was 13 years old, and he felt the warmth of the sun on his skin. But as he reached his class at school, something was off.

"Who's that guy?" asked his friend Billy.

Thomas turned around and met the new student. Her name was Sarah and she was from away, as evidenced by her unusual accent.

"I'm Sarah," she said. "I just moved here."

Her words were like rays of sunshine in his world. He couldn't help but be drawn to them. As the school day went on, Thomas found himself more and more enthralled by Sarah. He didn't even realize it, but he was making a story inside his head. When he got home that afternoon, the sun was still shining.

At first, Thomas was shy. He kept to himself and didn't say much. But when he did speak, it was in hushed tones, whispering and avoiding eye contact like it was a sin. But then, something changed.

When they got onto the topic of their favorite books, Thomas finally opened up. "I love storytelling," he admitted. "My dad told me stories when I was younger."

"What kind of stories?" asked Sarah, intrigued.

"Fairy tales mostly."

"Mine are more science fiction, mostly about space."

And that's when it hit Thomas: the connection. "I write stories, too," Sarah said with a grin. "I write in a journal."

The two clicked instantly, and within weeks they were inseparable.

Storytelling allowed them to connect with each other, and it allowed them to find an understanding of the world around them. Over time, their stories became intertwined, and intertwined they went.

From writing in his journal to plotting space adventures to sharing stories, Thomas and Sarah were destined to become something special.

They were the kind of perfect pair that made everyone around them envious.

They weren't just friends. They were story co-creators. They wrote in their journals until inspiration struck. And when they did, they were quick to write it down because Thomas and Sarah could talk to each other for hours.

These stories allowed them to become even better friends. They went from being mere acquaintances to having a special bond.

As the years went on, Thomas and Sarah wrote stories to each other. They kept them in their respective journals until Thomas could no longer keep up. During their college years, they wrote to each other while working odd jobs as they searched for their purpose in life. It was during those years that Thomas and Sarah made their greatest strides as writers.

And years after, as they both finally settled down, Thomas and Sarah remained closer than ever. But it wasn't just because they were great friends; instead, it was because they were the kind of soulmates who shared a mutual understanding. They were the kind who could finish a sentence just by sharing a look. They were the kind who could go in long tangents because they were already so alike.

But Thomas and Sarah were also very different. She was from Whipsnott while he came from a town out west. While she was a student at a prestigious university in Europe, Thomas was studying at the local community college. The only thing they had in common was their love of storytelling.

But as they remained close, the bond between them only got closer. They found that their stories matched up almost perfectly; except that they both had something different to offer each other.

Thomas was the perfect poet. He could rhyme and write sonnets the way that no one ever could. But Sarah was the perfect novelist. She could finish a plot in an afternoon. Her stories were the kind that could keep a reader glued for hours; while Thomas could keep writing poetry for years on end.

These two were meant to be together. They were the only ones who could pull the best out of each other. On writing this story, Thomas and Sarah realized it was this exact understanding that made them the best.

So, years later, as the story continues, the bond between them was still unbreakable. They were still inseparable. And as they exchanged stories to each other, they realized that their friendship needed no story to be told. It could keep existing beyond anything else.

Perhaps the greatest of Thomas's and Sarah's friendships was that it was just as good as the great stories that they wrote. And that's why Thomas could never be a part

<-----End of Generation----->

#### 4. Prompt: "Thine eyes shine like bright diamonds"

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Thine eyes shine like bright diamonds

Neko was unique among her kind. Her iridescent scales set her apart from the other members of her clan. Her tail, which was long and slender, was adorned with a pair of dazzling crystals that glowed in the dark. Her eyes were the most luminous of the entire species, each iridescent gem refracting a thousand colours as she walked and swayed on her tail.

This was enough to make her the most sought-after female in the land, even among those of her own kind. It seemed that all who sought her out were hoping to catch a glimpse of the magical creature.

When Neko entered the castle of an nearby kingdom, all the warriors and knights were in a daze, mesmerized by her beauty. The Queen, who was known for her refined tastes, was particularly enamoured of Neko and made her a courtesan. Neko used her exceptional skills and her own unique magic to keep the queen in her thrall, and was adored by everyone in the castle. As the stories of her beauty spread, it turned out that Neko had a special gift, one that no one had ever seen before. The people called her names like 'Stardust' and 'Fire of the Sky'.

Neko continued to live in the castle as the Queen's beloved and closest animal. She was never kept a secret, and people visited the castle from far and wide just to catch a glimpse of her. The Queen was proud to call her own Neko, and took her everywhere she went and showered her with gifts and jewels.

However, when the dark clouds of war gathered on the horizon and the Queen was forced to go away on a diplomatic mission, she left Neko in charge of the castle and its safety. But Neko wasn't just an ordinary animal, she was a magical being. And with her magical powers, Neko was able to lift the weight of the castle and restore it from the damage the enemy had caused.

When the war was over and the people returned to their homeland, they remembered how much they missed Neko and how she came with them. No one ever forgot the mysterious and beloved Princess with the magical eyes.</s>

What was the reaction of the people who visited the castle and saw Neko's beauty, and how did their attitudes change towards her after they met her?</s>

The people who visited the castle of the Queen's animal were not only mesmerized by her beauty, but also astounded by her unique powers. Some of them might have seen her as a godsend or a sign from the gods, and their reaction might have been to kneel down and worship her. However, they were not able to see her as an animal like the other members of her clan, as she had more human-like features. This might have caused them to fear her, and Neko had to earn the trust of the people over time before she could live freely in their midst without discrimination. Eventually, her magic and her mysterious beauty won over their hearts, and the people loved and admired her deeply, and the bond between the two was strong. They welcomed her with open arms, and the people of the kingdom and Neko's home all lived together in peace and harmony, and even celebrated her presence in the castle and the town with annual festivals, which honored her and her beauty among the citizens. Ultimately, the Princess came to reign as the King's beloved consort and the people still loved and admired her for her beauty and magic. Moreover, her beautiful eyes still glowed like a thousand stars, and she still continued to be the most amazing creature in the town, captivating the hearts and minds of all who visited her. Neko's beauty and magic was an inspiring and wonderful thing for the people to have, and many visitors still come to her castle and see her there. Even now, she still retains a special place in the hearts of many people, and her legacy and memory will be kept in the thoughts and conversations of generations to come. She is a magical gem in the kingdom, forever cherished and respected. The story of her birth and rise to power is a captivating tale, and many remember her as a symbol of the King's power and the kingdom's peace and prosperity. Her beauty and magical nature were a great source of blessing, and her story will be remembered and treasured forever. Even if the story was forgotten or lost over time, people still have a special place in their hearts for this

amazing magical creature, and anyone who ever got to see her will always keep the story, or memory of her, in their hearts and cherish it always.

Neko was an amazing

<-----End of Generation----->

## 5. Prompt: “Fly you fools!”

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Fly you fools!

It is the year 2184 and the world is in chaos. Corporations and governments have been collapsing across the globe. The wealthy few have fled to their private habitats, leaving behind the poorer population to burn and revolt. You, a skilled scientist, have designed a ship with a powerful thruster at the back which allows you to fly at dangerous speeds. It is time for you to get on board and save the day.

The ship is built and you are called upon. The elite are counting on you. The ship is outfitted with high-end weaponry to protect you as you go into battle. You enter the atmosphere of Earth and are instantly met with obstacles. Thousands of anti air-craft missiles are thrown at you. You must use your speed to dodge them. Despite being dodged, the damage has already caused several explosions and holes in the ship, and it is slowly falling.

You have no choice but to go on mission to save the day. You scan the skies for any enemy aircraft and dodge them one by one, constantly having to look behind your shoulder. Finally, your luck is up as you are able to destroy all enemy aircraft within the vicinity. Your ship is a formidable weapon against the tyrannical governments of the world, ready to take on any enemy that crosses your path. With a final tap of your thruster, you soar over the world, ready to take on anything in your path.

Fly you fools, the world needs your bravery and your skills. You are the knight of the sky.</s>

What does the world look like in the year 2184, and how has it changed since you left earth?</s>

In the year 2184, the world is a completely different place. The global crisis has brought about huge changes to the world's infrastructure, economy, and politics. Corporations are now competing for resources and power, and the gap between the wealthy and poor has widened. Technology has also suffered a massive boost with the emergence of private habitats, which are used for leisure, work, and residence. The environment has also drastically changed with the rise of pollution, leading to devastating health effects. However, despite all of these changes, you still have to rely on your skills to survive, relying on your ship's thrusters to get you wherever you need to go.

Despite the significant change in the world, you will not be able to hide from the dangers of the harsh environment. People from different countries will still find a way to get to you, and your job will be to try to thwart as many of them as possible. While the world is changing faster and faster every day, one will never be able to forget the thrusters that enable them to safely navigate a volatile world. It is easy to imagine the thrusters as the ultimate symbol of modern technology's power, a symbol that will surely be around for centuries to come. But as you soar through the sky, nothing can be more terrifyingly vulnerable than those thrusters, so each flight carries a risk. Your job is to take that risk, and protect yourself from whatever comes your way.

Your ship is an important symbol of the modern world, and the story will never get old. You are an expert inventor, with the know-how to design and build such a complex machine, and your skill is one of the most valuable traits a pilot can possess. Your mission is to take the ship and fly at blazing speeds through the skies, and you can look forward to doing so. It is an honor to be your pilot, and a privilege to have the best and the brightest on your side.</s>

What is the specific design of your ship and what kind of weapons have been installed for you to protect yourself?</s>

The design of your ship is sleek and aerodynamic, with each of its parts specially engineered to provide optimal performance. From the advanced navigation system to the powerful thrusters, every component of your ship is carefully designed to help you achieve high-speed flying capabilities with minimal drag. The rear of your ship is designed to house several missile canisters, each equipped with advanced radar technology that allows them to track and shoot down enemy aircraft. Additionally, two laser turrets have been installed on either side of your ship, which allow you to defend yourself from enemies coming from either side. The ship is a multi-layered defense system with advanced and diverse technologies to keep you safe, while your thrusters provide the power necessary for flight and attack. With all of these technologies combined, your ship is poised to be the most advanced weapon of its kind and the most powerful tool on your side. With a skilled pilot like you behind the helm, it is no surprise that the ship is the ultimate weapon in your arsenal.

<-----End of Generation----->

## 6. Prompt: “The underground passage led to heaven”

Generation:

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

The underground passage led to heaven

You enter the underground passage, feeling a cool breeze as you walk down the narrow path. The darkness is intense, making it difficult to see anything beyond a few feet. However, the way is well

marked and you are certain that heaven awaits. You finally arrive at the end of the passage - a grand opening in the ground - and you see the sky above. You are awestruck at the beautiful sight, feeling more enlightened than the passage way was indeed the path to heaven. As you look up, you notice that there is a gentle breeze coming from above, and suddenly, the light from the way shines down on you, taking you away to the heavens.

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Author's note: Hope you enjoyed the story! If you did, please consider a small donation to help me out as a writer =))) Thanks a lot! ~-\*

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Notes:

\* I'm sorry, but at this time, I do not know what is a better way to say something like 'my story is free from errors as much as possible.' I've had a few people tell me my story has too many errors and I'd like to tell all of you that I don't think that's a bad thing. Everyone else is welcome to critique and tell me what doesn't work, but as long as \*I\* get paid for this, you're free to say whatever the fuck you want about my story.

Now \*I'm\* off to do a few hundred words each hour #goals --

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(See the end of the workday journal section for information on how I work on a story)

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(See end journal section for my \$20 subscription list)

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(See the end of this entry for information on how I got paid for my fanfiction writing in the past) :)

- ~-\*

"What shall I do?" the young girl thought. "I can either take the path of science and follow a formula to reach heaven, or I can find a shortcut that bypasses the long and arduous journey through formulas and experiments." The girl decided that she would take the shortcut. She turned around and continued on the normal path of everyday school life, her thoughts still fixed on the heaven path. In a couple years she had arrived in her heaven, but when she started writing a series of stories on her past years leading up to her journey, she realized nothing had changed. She hadn't entered a higher realm. This was all the same to her.

"Huh...Maybe I was wrong about this path. What should I do?" she wondered. "This feels familiar, and I've only met a few..." She thought back to the journey before, remembering how she was a stranger to these people, yet felt relieved and excited by them. With a sudden realization, she understood: "My journey isn't meant for me either. I've only heard voices tell me to 'take this path' over and over again, yet it isn't the path of my heart. I should follow my heart. Follow the feeling and not the logical path that society says to take." Suddenly a light bulb went off in the girl's head. "This is the best idea I've ever had!" She smiled. "But why haven't I followed up with any of the voices that told me to take this path?" She had a realization that she hadn't followed up because the voices she had heard before

were like a GPS telling her in a robotic way, "Go left. Go right. Go straight." It was as if she had been too afraid to veer off and trust her intuition. The girl decided to try the shortcut as a last resort. Even with the risk of it being a dead end, she went towards the light at the end of the tunnel. "I mean, what's so wrong if it's not the path that society tells you to take, but it's what makes you happy?" she thought.

- ~\*

Heading straight out of the castle's grounds, the prince made his way down a cobblestone path. It was a peaceful walk, with the sound of

<-----End of Generation----->

## 7. Prompt: "The ray gun vaporized the entire town under the sea"

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

The ray gun vaporized the entire town under the sea

<br>

Everyone had been walking through the town, each unaware of the other, just that they both happened to end up in the exact same spot, beneath the sea. The mayor and the scientist both happened to be walking along the shoreline when a loud, loud crash filled the air. They both looked up in disbelief and saw the lighthouse ablaze with a brilliant light. When they both got to the edge, they saw a gigantic hole in the sea, and a boat wreckage in the distance. Just as they were about to check survivors, the mayor spotted them in the distance and beckoned them to come over. He told them he'd seen something amazing that might help them later, and he wouldn't say anything else until their boat made it to the shore.<br>

"You can come out now," he said, once they'd made it out onto the sand. They approached the spot where the crash had happened, and they found a mysterious box. It was covered with seaweed and barnacles, and there was a large crack in the glass door. In front of it was a door that glowed and sparkled. They opened it, and inside was a circular room, with a door in the exact center. The mayor turned to the scientist, and they both just nodded, knowing this would be a scientific discovery.</s> What kind of scientific discovery do you think the town would make that is connected to the glowing door in the circular room?</s>

As an AI language model, I do not have information on the specific scientific discovery that would be made in the town. It could be anything from a scientific breakthrough in marine life analysis, a revolutionary new medical technology, to an experimental method for energy production. The possibilities are endless. The town could be the epicenter of a revolutionary discovery that could change the course of scientific research in the future.</s>

Considering the glowing door and mysterious box, one possibility could be that the discovery would have to do with the intersection of science and the supernatural, with elements of magic mixed into the mix as a new way of harnessing power from the natural world. It could also be related to technology, as hinted by the glowing door's appearance and the scientist's interest in what may be inside. Alternatively, the discovery could be connected to more advanced medical research, leading to the possibility of a breakthrough in regenerative medicine or even a new cure for various diseases. The possibilities are limitless, as shown through the glowing door and mysterious box in the fantastical tale. In the end, only time would tell what type of scientific discovery the town would make, and what it could lead to in the scientific world.</s>

The town could also be at the center of a new age for scientific advancement, with the discovery potentially paving the way for a new era of space exploration or even time travel. The town's residents could be at the forefront of cutting-edge scientific research, working on solutions for issues such as global sustainability or climate change. The discovery could even involve the power of quantum computing or new advancements in artificial intelligence, leading to revolutionary advancements in fields such as finance or manufacturing. The town's scientific discovery could have the ability to catapult humanity into a new era of research, or even completely change the way we perceive the world.</s>

Overall, the discovery could be anything that science has yet to imagine or can even comprehend. The town's inhabitants could potentially uncover something completely unexpected, or be on the brink of making a scientific breakthrough that could have potential implications that extend beyond the town's borders. The town's scientific discovery could be the first step in a new age of scientific advancement, one that could have implications that are only just beginning to be realized. It could even be something as revolutionary as time travel, or as simple as a new type of renewable energy source. The possibilities are limitless, and the scientific discovery the town could make could be as simple or as complex as the scientific breakthroughs it is currently researching and working on. At the end of the day, the discovery could be anything, and only time would tell what it could lead to for the town.</s> Regardless of whether the scientific discovery was something completely unexpected or a straightforward application of current scientific knowledge, the town's residents could embark on a new era of discovery and advancement. Their scientific discovery could lead to a complete shift in the town's fortunes, with everything from infrastructure to educational standards drastically transformed. It could also involve novel ways of harnessing and using resources, allowing the town to become an industrial hub once again. Ultimately, the new scientific discovery the town could make could have an impact far beyond its immediate community, impacting the wider world and leading to a new era of scientific advancement.

<-----End of Generation----->

8. Prompt: “Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality”

Generation:

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality

=====

In the beginning there was a void, and with no one to call upon to create the story, Nadishan decided to tell tales of his own creation to keep the void from filling up with emptiness.

Kushan, the creator of the universe, had a great desire to learn more about his infinite creation, and had created tiny beings called Nadishan. Not long after these creations had been created, Kushan realised that the void was filled with empty silence. He had no choice but to create new lives to fill up this emptiness.

Nadishan created tales of his travels through the void. As he travelled through his creations, he found that too much was missing. Noticing a vast emptiness within his creations, to fill the void he had to tell tales of a forgotten past, and the days of his creation.

Dilshani, an expert in the void was summoned before Kushan to learn from the tales of his creation. Noticing an immense emptiness, Dilshani too decided to tell tales of his own creations in order to fill up the void.

Nadishan and Dilshani worked together to create tales of tales, tales of creations and the day of their creation. Through these tales they filled up the void and in time, were able to restore a sense of balance in the void.

From this point, the two were known as the great heroes of the void, and the stories of their tale were spread far and wide.

The End

=====

[A new story is chosen each week - this week's story was written by @Pranav]

It's been so long since the last time you heard the sound of chirping birds in the morning. You remember the day those colorful flowers and gentle winds of the sky had been the only way to get by as you used to wake up to the morning sky.

With every chirping of birds, you can feel the morning breeze and warm sunlight on your skin. The only sounds of the morning are the chirping of these little creatures. But then again - they're just a part of what helps fill your life with warmth and joy every morning.

From the flowers blooming in the garden to the children playing in the park, the birds chirping are a part of the soundtracks of your everyday life. You may not notice at first, but these chirping sounds fill your ears with a peacefulness and calm.

You realize now, that it is the little things in life, no matter how little, that are the best things and are the most underrated. Noticing these small parts of life brings us so much happiness.

You breathe a sigh of relief and feel warm about life as you remember the little chirping sounds of the morning and the simple joy from it.

On this beautiful Sunday morning, you wake up with a smile on your face. Today, your heart beats in rhythm with the chirping of the birds as you remember the beauty of life.

You take this little moment to take peace, this moment that was brought to you by the chirping of the birds, before your day starts.

You hope the birds continue to chirp their melodies, on a beautiful Sunday morning or as part of your everyday life.

The end.

[This story is written in a poetry style - to read the story from the main prompt, "The last thing before I woke" by @Pranav]

"The Last Thing Before I Woke"

I can't remember how many times I have slept without dreaming  
For the sake of forgetting the dreams that I would wake  
There was nothing special about that morning for me to scream  
Because there's nothing I fear about that day I might meet

I lay there awake with no sign of a sunrise  
And in the night I kept pondering why I chose this path  
When I was looking at the stars I felt something unique  
A path I had been on for the last 3 years

How was it different from the path I took when I walked?  
And that one question I couldn't answer  
It was like it was the end of everything  
Without a sunrise  
And I had to choose a path from it  
I think now is the time  
For a peaceful new start  
To think of the last thing before I wake  
That the night had been  
Not the last night, I would just be away for a while  
My days were good for you to come over  
My nights were peaceful, I had a good reason to be a man

Of late a lot of things have been happening for me

But

<-----End of Generation----->

9. Prompt: “Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen.”

**Generation:**

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen.

Many suitors lined up around Suj and Nihara, each hoping to win the hand of the kingdom's royalty. As weeks and months passed, suitor after suitor was eliminated until only three remained. That night, the three princes and princesses, along with their retinues, arrived at the grand ballroom.

Their royal father, King Suj, decided this would be the best chance for Suj and Nihara to pick their best suitor. He lined up all three princes and princesses at the middle of the room, each having a tray of the most prized delicacies of the kingdom.

The first prince started offering the most expensive dish, a delicacy that can only be found in the kingdom's most prestigious castle. He asked Suj, “Your majesty, may I have your hands for a moment?”

Suj obliged and placed his hand on top of the prince's. As the princes tasted the food, the second prince kept his eyes on Suj, not the princesses. The third prince then took Suj's hand in his and gave it a soft kiss on the back.

Each of the princes offered their delicious delicacies, but Suj couldn't decide. He was captivated by each of the princes, but it was impossible for him to pick just one.

Then, the last prince stepped forward and whispered in Suj's ear, “When my father saw my mother for the first time, he knew she was the one for him. I see the same thing between your daughter and my brother. Not just a match made at first sight, but a love you feel with your entire being. I'm confident in my pick, I trust my gut, but I'm here for you.”

The King's heart warmed to see his son choose the future Princess of the kingdom. He gave his blessing to Suj and Nihara. Suj kissed the prince on the head and thanked him for offering the best delicacies on the kingdom's table.

Nihara, Suj and the prince stayed up that night and exchanged stories about the kingdom. Eventually, Suj and Nihara and the prince went their separate ways. As Suj walked down the cobbled path, he thought of the prince's words. Suj and Nihara, the King and Queen of the kingdom, got lost in each other's eyes once again.

The prince's family was grateful to Suj for being very generous with their son's selection. Suj took care of the prince, and ensured that their son received the best of the kingdom. Suj rewarded the prince with all the luxuries he wanted. Suj saw the prince being well-cared for, surrounded by the finest in Suj's kingdom.

The prince's family and friends came to Suj's palace for dinner often, and Suj made sure to serve the prince his favorite dishes.

The prince's sister, Janu, would always come along and ask for Suj's help and guidance. Suj often put the princess on his lap, and would read stories to her each night before bed. Suj loved the prince and princess very much. He made sure to spend more time with them as the days went by.

Suj's kingdom was blessed with one of the most beautiful couples in the kingdom. As Suj watched Nihara's laughter, and the prince's prince-like actions, he had no doubt that Suj and Nihara took a beautiful journey together. Suj blessed the royal couple with a daughter named Pari, and a son named Saurabh.

After almost six months of being a king, Suj made sure to create a legacy for his kingdom. He would tell stories to the prince and princess, and teach them the stories of their kingdom. Suj would make sure that the kingdom remembered him with kindness and loyalty.

Years went by, and the children of Suj and Nihara began to rule the kingdom. Suj's reign was one of the most peaceful and prosperous times in the kingdom's history. Suj was known as one of the best loved kings in the kingdom. He was respected by all, and his reign has been remembered with kindness and love.

Now, Suj would get up early each day and take a walk with Nihara and Pari on the palace grounds. Suj would tell them stories, take walks and share sweet delicacies from the best kitchens in the kingdom. Suj would always be with Pari and S

<-----End of Generation----->

10. Prompt: "Aragon and Frodo along with Passepartout leapt from the plane"

## Generation:

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Aragon and Frodo along with Passepartout leapt from the plane. The character, Grogor, is a space pirate who has taken his ship in search of some of the most exotic artifacts of the universe. With plenty of supplies and weapons the ship was fully-suited to take on some of the toughest and most dangerous missions.

After the jump Frodo landed in a mountainous region, and began searching for the old ruins and artifacts of previous explorers. After a while they encountered a huge ancient door. Frodo was sure this was a precious and ancient relic and was surprised to find out he could move it with little effort. Inside the door was a complex set of chambers; each chamber bigger and more complicated than the last.

Exploring the chambers Frodo found countless artifacts, some of which were very powerful. Unfortunately, he missed some of them which he was disappointed to discover. However, after some exploration he found a beautiful ancient relic that had been stolen by pirates. He was able to find it, and with help of some artifacts and the power of the ancient door, he was able to enter the chamber and successfully retrieve the artifact.

With his mission complete and the relic safe, Frodo and Grogor had a bit of a rest on the mountains, but they were in awe of the ancient door that brought a lot of artifacts. From now on they will be known as great explorers that might also explore the door and uncover more secrets.

Grogor and Frodo had a very long and satisfying journey; they have seen a lot of the most exotic artifacts in the universe. And as Grogor says, their adventures cannot be fully complete until they have found the most valuable and rare of them all - the door. After they find it, their legend will grow even more and many historians would start to use their names to define great adventures.

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<-----End of Generation----->

## 11. Prompt: “Great Scott!”

### Generation:

You are an expert storyteller.

You are good at generating long science fiction stories.

Generate a thousand word story based on:

Great Scott!

A long time ago, when I was walking home from school, I spotted a guy flying a spaceship! It looked like it was some sort of experimental prototype, with an unusual design that had an angular black frame and two circular ports in the back. I watched it closely and noticed the pilot was a man I had seen in a shop before. He seemed to be in his 30s, short, and had a thick beard. I watched the craft fly in the air and try to land it, but eventually it fell down and crashed. The man looked dejected as he stepped out of the wreckage, covered in bruises. He was bleeding from cuts in his hands and face, and his skin was scraped and bruised from the fall. Suddenly, there was a bright light in the sky and I heard a loud explosion. He was gone in a puff of smoke and I was left standing there, shaken and disoriented.

But now this strange man is back and he needs my help. He says he needs to be driven somewhere, but I'm not sure who to trust. I can't see the man's face anymore, but his presence is still there. I get in the driver's seat and he tells me where to find his friend. As I drive, I get the feeling something strange is going on and I'm probably not in control of my actions anymore. I pull up to a house and park the car out front. A man walks out and introduces himself as Robert Andersson. He says he's been in an accident and needs my help in the house for a bit. As I step inside, I realize I can still taste the metallic tang of the man's blood in my mouth.

He tells me that he needs my help with a top secret government project that he used to work on during his career. He says that the government is threatening to destroy everything he has worked on if he doesn't finish it. I believe him, and even though I don't know him anymore, I feel obligated to help him finish his work. So, I agree and follow his instructions carefully - and slowly uncover the truth behind Robert Andersson and the bizarre mystery surrounding him. It seems that the government had been working on a project to colonize a new planet, but they had no idea how to get there. Andersson had spent years working on the project, which meant he had access to the classified information and the rocket necessary to make the trip. They had to go on a dangerous mission to get him to finish it, and he needs help to do this. I soon realize that I am more involved than I thought, and as Andersson

tells me in the dark, secretive world to which he belongs, I must embark on a daring rescue mission to save an innocent man and get some answers about the government's secrets.

As the weeks pass, I learn more and more about the project. It seems like there are multiple levels of government secrecy surrounding it. I find out I'm not the first person to be approached about the mission or the first one to be recruited. And I also find out that Andersson had been blackmailed into taking the mission. Now he is blackmailed again to finish his work, which means taking an enormous risk. I'm going to have to take this job, even though I know the risks. I've been through some dangerous missions in my time, but this job makes me think of the old saying "it's not that I've been so lucky. It's more that I've been in very, very bad luck."

That very night, you got all the information you needed from Andersson, he completed his mission, and you got the call to come help him out. You arrive just ahead of a government drone, which is gunning for Andersson as the pilot lands the rocket. You try to help him, but unfortunately the drone is too fast and Andersson's in too much danger. After a short and intense firefight, Andersson is killed, but the rocket is successfully launched. Suddenly, the government is in a panic and contacts you. They tell you the rocket was a prototype spaceship and that Andersson was a member of a secret space flight program. It seems this program existed to colonize a new planet, and that planet was right here on earth. The government has been secretly colonizing people from that planet for years, and they finally want Andersson's rocket to finish the mission.

You set about getting the rocket and the colonization project ready, but this time you're the one who is leading the mission. When the government contacts you, make sure that your communications are secure; you know how to fly the rocket and you have the necessary supplies. After a brief battle with enemy

<-----End of Generation----->

## Chat GPT 3.5

The stories generated for this model with the exact same 11 prompts can be found here:

<https://chat.openai.com/share/318536db-7164-4a4a-8fec-116567ac6edb>

Since they are preformatted and the text is clear for viewing and evaluation, these generations will not be included here.

A sample is as follows:

The screenshot shows a ChatGPT 3.5 interface. The user (You) provides a prompt: "Generate a thousand word story based on or using the given prompt. Prompt: 'He drew his sword and pointed at the peculiar'". ChatGPT responds with a detailed science fiction story. The story begins with Captain Adrian Rourke in a dimly lit chamber, drawn to a peculiar object that resembles a giant crystal. The crystal is described as shimmering with strange, otherworldly light, suspended in mid-air, and emitting a low, melodic hum. The crew, a ragtag group of misfits and adventurers, watches from a safe distance. Adrian's hand trembles as he points his sword at the crystal, which seems to respond to his touch, its surface rippling like water. A voice echoes in his mind, soft and soothing, welcoming him as the guardian of the Nexus. The story concludes with a note that ChatGPT can make mistakes and suggests checking important information.

ChatGPT 3.5

You  
You are an expert storyteller.  
You are good at generating long science fiction stories.  
Generate a thousand word story based on or using the given prompt.

Prompt: "He drew his sword and pointed at the peculiar"

ChatGPT  
He drew his sword and pointed at the peculiar object that lay before him in the dimly lit chamber. The room was filled with an eerie stillness, broken only by the soft hum of ancient machinery. The air was thick with a sense of foreboding as he took a step closer to the mysterious artifact.

Captain Adrian Rourke had spent his life exploring the far reaches of the galaxy, seeking out lost civilizations and forgotten relics. He had seen his fair share of strange and wondrous things, but the object before him was unlike anything he had ever encountered.

It resembled a giant crystal, its surface shimmering with a strange, otherworldly light. It was suspended in mid-air, seemingly defying gravity, and emitted a low, melodic hum that resonated in the depths of Adrian's soul. He had been drawn to it, as if by some invisible force, and now he stood before it, unable to tear his gaze away.

His crew, a ragtag group of misfits and adventurers, watched from a safe distance, their expressions a mix of awe and fear. They had followed Adrian into countless dangerous situations, but this felt different, more ominous.

Adrian's hand trembled as he pointed his sword at the crystal. It was a finely crafted weapon, passed down through generations of Rourke's, its blade forged from the heart of a dying star. He had used it to fend off pirates, alien creatures, and hostile forces from countless worlds, but now it served a different purpose.

The crystal seemed to respond to his touch, its humming growing louder, and its surface rippled like water. Adrian felt a surge of power coursing through him, as if the crystal was tapping into his very essence. He was both exhilarated and terrified.

A voice echoed in his mind, soft and soothing. "Welcome, Captain Rourke. You have been chosen to be the guardian of the Nexus."

Message ChatGPT...

ChatGPT can make mistakes. Consider checking important information.

Figure 23 Chat GPT-3.5 Sample story generation

## Chat GPT 3.5 with Author Instruction

Similarly, the generations with instructions to mimic authors is given here:

<https://chat.openai.com/share/87ad426c-79ac-444c-ab9c-961688df587a>

A sample is as follows:

ChatGPT 3.5

You  
You are an expert storyteller.  
You are good at generating long science fiction stories based on the style of Shakespeare, Jules Verne and H.G. Wells.  
Generate a thousand word story based on or using the given prompt.

Prompt: "He drew his sword and pointed at the peculiar"

ChatGPT  
In a distant future, where the boundaries of time and space had been bent and twisted by the ingenuity of humankind, there lived a brave and noble explorer named Sir Edmund Alaric. His heart burned with the insatiable desire to uncover the mysteries of the cosmos, to traverse the uncharted realms of the universe, and to discover the secrets that lay hidden in the farthest reaches of the cosmos. Clad in a suit of gleaming metal, his countenance was marked by the wisdom of countless adventures and the determination of an unyielding spirit.

One fateful day, as Sir Edmund Alaric sailed through the cosmic ether in his magnificent spacecraft, The Celestial Voyager, he received a mysterious transmission. It was a signal unlike any he had ever encountered, a cascade of pulsating lights and enigmatic symbols that beckoned him to a realm beyond the boundaries of his knowledge. With a heart full of curiosity and a hand firmly grasping the hilt of his trusty sword, he embarked on a journey that would challenge the very limits of his existence.

The transmission led him to a distant and peculiar world, a place where reality itself seemed to dance to the whims of an unseen force. As Sir Edmund Alaric descended through the shimmering atmosphere, he beheld a landscape that defied all reason. Towering spires of crystalline rock reached towards the heavens, casting eerie reflections in the iridescent waters that stretched as far as the eye could see.

He drew his sword and pointed at the peculiar sight before him, a colossal creature of shimmering energy that hovered in the air, its form shifting and undulating like a specter from a fevered dream. Its eyes, if they could be called such, were twin orbs of pure luminescence that seemed to peer into the very depths of Sir Edmund's soul.

"Who dares intrude upon the domain of the Sylthorians?" the creature intoned in a voice that resonated with the power of the cosmos itself.

Message ChatGPT...

Figure 24 Chat GPT-3.5 generation of story with Author style instruction

## Chat GPT 4

The stories generated for this model with the exact same 11 prompts can be found here:

<https://chat.openai.com/share/0d909b3c-cd01-4aab-9327-eaa000ced522>

Since they are preformatted and the text is clear for viewing and evaluation, these generations will not be included here.

A sample is as follows:

The screenshot shows a dark-themed interface for ChatGPT 4. At the top, it says "ChatGPT 4". Below that, a user message from "You" is shown, followed by a prompt. Then, the AI response begins, starting with a detailed description of a futuristic city called Eridu where technology and mysticism coexist. It then describes the "Peculiar", a mysterious orb that appears suddenly. The narrative continues with the introduction of Jaxon, a young warrior with a unique sword. As Jaxon approaches the Peculiar, the crowd reacts with awe and fear. The Peculiar itself is described as a creature of impossible geometry, constantly shifting and changing. Finally, Jaxon stands his ground, ready for whatever the Peculiar might bring. The story concludes with a dramatic flourish, though the final sentence is cut off by a redacted area.

ChatGPT 4

You  
You are an expert storyteller.  
You are good at generating long science fiction stories.  
Generate a thousand word story based on or using the given prompt.

Prompt: "He drew his sword and pointed at the peculiar"

ChatGPT  
In a realm where technology and mysticism intertwined, the city of Eridu stood as a beacon of advancement. The sky was laced with hovercrafts, and the streets buzzed with the energy of progress. Yet, amidst this bustling utopia, there existed an anomaly that defied explanation - the Peculiar.

The Peculiar was a phenomenon that appeared suddenly in the heart of Eridu. It was a shimmering, translucent orb, floating a few feet above the ground, pulsating with an ethereal light. Scientists and mystics alike were baffled by its presence, for it defied the laws of physics and magic.

Among the curious onlookers was Jaxon, a young warrior trained in the ancient art of swordsmanship, a practice considered archaic in the age of laser weapons and psychic warfare. But Jaxon was no ordinary swordsman. His blade, forged from a meteorite and imbued with arcane energies, was said to have the power to cleave through the fabric of reality itself.

As Jaxon approached the Peculiar, the crowd parted, their eyes wide with a mix of fear and anticipation. He drew his sword, the metal singing as it left the scabbard, and pointed it at the enigmatic orb. The air crackled with tension, and a hush fell over the onlookers.

Without warning, the Peculiar reacted. It pulsed rapidly, emitting a blinding light, and from within its depths, a figure emerged. It was a creature of impossible geometry, its form shifting and changing, never settling on a single shape. It was as if the Peculiar had given birth to a being from another dimension.

Jaxon stood his ground, his sword ready. The creature spoke in a chorus of voices, each syllable resonating in the minds of the spectators. It proclaimed itself as an envoy from a parallel universe, sent to Eridu to warn of an impending cataclysm that threatened multiple realities.

Message ChatGPT

Figure 25 Chat GPT-4 Sample story generation

## Chat GPT 4 with Author Instruction

Similarly, the generations with instructions to mimic authors is given here:

<https://chat.openai.com/share/7ed8dc28-ad90-4daa-82cf-e55773c34e34>

A sample is as follows:

The screenshot shows a ChatGPT 4 conversation. The user (You) provides instructions to generate a story in a specific authorial style. ChatGPT then responds with a detailed narrative.

**You**

You are an expert storyteller.  
You are good at generating long science fiction stories.  
You copy the style of Shakespeare, Jules Verne and H.G. Wells in your stories.  
Generate a thousand word story based on or using the given prompt.

Prompt: "He drew his sword and pointed at the peculiar"

**ChatGPT**

In a realm where the boundaries of time and space entwine, like the interlacing branches of ancient trees, there existed a world of profound mysteries and wonders. It was here, under a sky painted with the vibrant hues of nebulas and stars, that our tale unfolds. In the tradition of the great storytellers Shakespeare, Jules Verne, and H.G. Wells, let us embark upon a journey through this cosmic tapestry.

**Act I: The Encounter**

He drew his sword and pointed at the peculiar object before him. Sir Cedric, a knight of the Order of the Cosmic Sphere, stood resolute on the craggy surface of a distant planet. His eyes, reflecting the luminescence of distant galaxies, were fixed upon a structure unlike any he had encountered in his interstellar travels.

The structure, pulsating with an ethereal glow, was a monolith of unknown origin. Its surface was adorned with intricate carvings, depicting scenes of celestial events and otherworldly beings, a tapestry of cosmic lore.

"By the stars, what art thou?" whispered Sir Cedric, his voice carrying across the barren landscape.

As if in response, the monolith emitted a harmonious frequency, resonating with the energy of the universe itself. The air around Sir Cedric vibrated with unseen forces, and in that moment, he felt connected to the vast expanse of the cosmos.

Message ChatGPT... ↑

ChatGPT can make mistakes. Consider checking important information.

Figure 26 Chat GPT-4 generation of story with Author style instruction

## *Fine-tuned GPT-2 Final Model*

### 1. Prompt: “He drew his sword and pointed at the peculiar”

#### Generation:

He drew his sword and pointed at the peculiar creature, whose white, rounded face was hidden beneath two large bushy eyebrows and a mouth adorned by small teeth set in a line down the middle of its face—its jaw itself, a very unusual feature in these lower vertebrates, and which was adorned by two large, round teeth, one set in front and one set behind on both of its heads, and which were adorned with a yellow, fleshy band at the top and sides, a ring of bright, violet-hued feathers, a ring of silver on each side of its body, a fin exactly like that of the skiff of an eel or the argonauts, and various other appendages from the tail, wings, teeth, and so forth—all objects highly suggestive of some superhuman being, though none of them had the ring of a demon, and none were even faintly resembling the wings or the tail of a human being—and, finally, drew forth his crony of a brother, whom he met on the platform, not as the messenger of the sun or moon, but holding in one hand the weapon of a policeman and in the other the whip of a wild bull, and was about to lash the creature with the whip of the same name, when the thing which had been so unusual to him suddenly changed into such a state of sluggish animation that it seemed to him like an actual apparition, for the whip had come out just at this moment, and the appearance of that whip had left him dangling and unable to move a step or draw back a step amid the hectic scene that had passed near and was now hanging over him like a specter on a date-palmer, while his eyes followed the movements of its bearer with hazy gleaming irises, as though they followed them with a sort of dazzle and fascination, and his whole being seemed concentrated and drawn in one direction only from the moment he had drawn it until it was out of his reach, when the whip had disappeared and he stood still, his arms extended, his body leaning almost unconsciously, his sword bent at a point over his head, his sword between his legs like a club held out to the wind, and as he held his sword with one hand, all the while cursing the fate which had befallen him, he felt an unpleasant, uncomfortable sensation about his loins just above his waist, and at the same instant the prodigious energy of his sword came back again and he slashed at the thing with the whip as on his shoulder and as suddenly as it had vanished, with a speed and precision that startled even himself, a blow which sent the thing sprawling with a ringing crash in the air, and the next thing he knew it had passed and was gone! “I shall never see such a creature again! But at least I will always see an impudent creature, and one which shall always be threatening to those who meet her.’s approach; this is a menace to me, and I give you the whip, for if I am taken, I declare myself at your service forever,” and with that voice of mildness and humanity which the younger generation of the Musketeers had always impressed on him, Conseil added, “You can give me no rest till I surrender my weapon.”; but to this effect, with a movement of the head which showed that his sword was lodged between his two hands and not in any part of his body, he raised his head and spat a bitter, insolent, spiteful word at him, which Conseil understood but half as well as I did, and in spite of his stifled protestations he drew the whip from his belt and held it about his throat—a position which was almost imperceptible even to his master and quite out of his reach, but which seemed to have a dreadful impact upon the thing with which he had been about to fight and to produce a terrible effect upon me as he thrust it at this creature who had now changed into such a perfectly harmless and complaisant personage on the platform of the Reform Club, a creature which was evidently much agitated and much impressed by the changes which came upon him in this world

in the shape of this transformed creature, who was now turned into the hero of that world, with his sword raised and his voice hoarse and hoarse and hoarse, as if he were going to deliver his final message to his persecutors—though I could hear no more as the hour drew on and the noise of voices increased—though, on the contrary, everything seemed to be going according to plan and things seemed at last to settle down in the tranquil and peaceful life that my companions and I had led so happily and securely for a year and a half, in which we had just had a simple dinner, a fruitless exercise in which we had done without any food for a long time, and, besides, nothing to amuse ourselves with except playing cards and whistling and jingling at random.

<-----End of Generation----->

## 2. Prompt: “Nihara the warrior princess was calm in the face of danger. No one dared challenge her now.”

**Generation:**

Nihara the warrior princess was calm in the face of danger.

No one dared challenge her now.

“It will be easy for you, my lord! You will have the upper hand for some time, and nobody will want to draw swords against you when you have such formidable opponents!” It was not difficult to see what effect her courage had produced in this eccentric woman, who in the meantime, had begun to grow wise to a real art, and could not but perceive that she had won the hearts of her friends by a strange drama, when the old man’s words, full of gallantry, made her utter surprise and terror on seeing the effects of her audacity upon the young Musketeer, who, not only looked her fair in the face, but smiled on seeing the joy which was at his birth, and the gratitude she felt toward the great lord who inspired in her heart by having made her father, a handsome knight, and who was no doubt, at the time, one of the most illustrious men in Japan, the most exalted in his kingdom, and lord of a kingdom which, since the fall of the Japanese Empire, had always held out to him with a lofty and proud reputation—lord of Japan, lord general of Japan, and lord of the whole Asia, where, after the war, his domains were extended to every point except Edo; lord of the East, where his territories were extended to every part except Kyushu; lord of Nagasaki, lord of Chikina, lord of Nagasaki, and lord of Kyushu—a kingdom which, according to official sources, extended from Edo to Nagasaki, extending from Japan to Nagasaki, in truth, an immense kingdom in the shape of a single state, a vast state with an area of 370 square leagues, hence of 700 leagues! The Japanese, then, declare that this is the only true and true Japanese enjoy of the Nautilus! The Nautilus had crossed the whole Indian peninsula, not only the East, which islets line the coasts of China and America and Japan and even the Laccadive, from the coast of India down to the coasts of America! It had traveled from one end of the globe to the other, from Cape of Good Hope to Cape of Foxtrot, but had never entered the sea between the Tuamotu and the Tuamotu or the Cape of Bestia; the sea being at that point an incalculable wilderness! It had passed through several seas in a row, and in the midst of these waves of water had come to the islands of Java, located on the south-west coast of the island group of the Malay Archipelago, off Sumatra proper (whose name, appropriately enough, the Arabic language pronounced “Tuamotu,”), and upon

the northeast coast of Sumatra proper, off the coast of Malaysia, a small island in the heart of an immense territory whose surface area measures 4,000 leagues long and five leagues wide! It was on its voyage from this coast to the coast of Ceylon, and from Ceylon to Java, with the whole gamut of local customs and local traditions! It would have gone, then, even to the New World, to that continent where so many thousands of sailors and so many ships had perished in the Pacific during the war: the Spanish-American conflict, the French-Ned Land voyagers of 1857, the Portuguese-Bartolomeo, the Portuguese-Guadalupe, finally the Frenchman-Frederick de Meneses in his ill-fated attempt in 1866, the English-Barry Whiting in 1867, the navigator-Frederick Bowdoin in 1873; to the island of Tahiti—an island whose existence was questioned even then by the celebrated navigator Commander Cook, chief of the Bureau of Oceanography at the Paris government, who, for some years afterwards, had insisted that its true nature be recognized—to that island, which the Japanese have always denied ever having existed, as I have already stated! To that island, which had been mentioned to Captain Dumont d'Urville as having sunk during the Battle of Neufchâtel, the Englishman, in 1794, and in 1867, when that island was still unknown to all but its most fervent believers! But it was then that this whole bizarre narrative began to seem to unravel itself! The story began to decline into a kind of inevitable monologue, only to recede again like the drops of a river; it grew darker and darker until, in essence, the sea became a battlefield in which I could hear cries and groans escaping from a thousand mouths! As I heard this narrative receding from me I came to perceive that it had become an apoplectic fit, like those fits in the antechamber.

<-----End of Generation----->

### 3. Prompt: “And so it was the beginning of a beautiful friendship. Perhaps even something more.”

**Generation:**

And so it was the beginning of a beautiful friendship. Perhaps even something more. Pshaw! What can he be thinking, when we are so near a decision as to go with him to the ‘Nam?’? Not a thing, not a thought! You see now, my young friend, what a long, winding road it is to decide; and when you reach a decision, you can take a hundred opposite ways, and it is not probable you are ever going to reach a decision again; and you might as well adopt my plan as mine to-morrow, and tomorrow it would be so much wiser, because your friends will be as good or as bad as they are or are; so you have got to be patient!” “Do you believe so?” cried Andrew Stuart; and his eyes flashed round for a moment for a moment into icy fire, and then fell without another instant in the depths of his heart, as one resigned himself to wait till they were sure they were no more likely than not to be at all sorry for having to deal with a person who, for an instant, he felt as good as if his life depended upon him, and whom a minute before they had been so glad to have avoided! “I tell you,” returned Andrew Stuart, in a soft voice, as he walked up and down again on his horse, and spoke with a tone of deep conviction, “I do not believe a word you are saying,” as he passed his arm through his friend’s; “and so I can only hope, in time, to find you at last, for if I am wrong, my dear fellow, and he kills you after the fashion in which you treated him, and you kill me a second time as he threatened, there is still time! You see now, Andrew Stuart, I will save you from myself; believe me, I am not so far from it as you believe,

and if you are so far, I will make you a fortune, if you will but wait till I have saved you!--and so much the better!--and then God will reward you! But of what price could I stake my life in you, now, now, now, dear fellow, now that you are as hot-headed as you were yesterday? I should only save myself with the hope of someday making so great a profit over the life of that poor woman as you sell her for! But where would I get the hundred guineas, now that I was about to stake my wife?" Andrew Stuart stopped again, and looked as if he were in a daze; and at the top of his head a long, blackish shadow, almost like smoke, which descended almost to the ground, grew brighter and vanished, and was followed by a red, glowing glow of an altogether different colour and a intensity that did not correspond with the brightness of the sun, until it made a circle round it and vanished in a red-tinged smoke which glided and rolled through the air like smoke from the burning pine trees, leaving only a red, warm suggestion in the air and a trailing, faintly perceptible vapour behind it, at the edge of the hot air in which the conversation was going on in the train, until it disappeared completely concealed us in the crowd and swept us across the vast empty space which was between the station and the house of the log-house on the slope of Putney Hill in one of the pleasant, leafy suburbs which the railway extended slowly southward till it merged with the clear, blue air on the hill side and gave us a view of Maybury to the east and west, before we reached the great Putney valley, which was still grey and grey upon the horizon against the blue sky, and seemed suddenly to grow red again through the grey branches and bright green woods to the westward of the station, and then changed to a bright, blue colour again upon the slope of Charing Cross and Kingston upon the hill, till at last it was nothing but the blackness before us, before we left Putney again and reached Kingston on the broad, clear Sunday before the sodden dawn of the first Monday in the Month of September? Then, with a long, hollow cry, like the thud of an echo, the wheels of the Martian came trotted swiftly along upon the empty pavement of Maybury, rolling with the waves until the wheels bumped against one another, as if there were no ground upon which to dig the pit and lay their victim! At last, just as the wheels had settled down upon the ground, the wheels sounded again and again with a continuous succession of growls and growls, but this time accompanied with the distinct, piercing thud of an enormous foot--a foot like the tail of a great tiger--which crawled slowly through the heather on the side of the road, creeping towards us, until it was concealed among the heather by the thick, still heather on

<-----End of Generation----->

#### 4. Prompt: "Thine eyes shine like bright diamonds"

Generation:

Thine eyes shine like bright diamonds; Thy hair is golden; thy tongue doth quench the blood which doth quench thine open wounds.—Thou art the Prince of Verona, which hath slain Romeo, and Romeo died.—The Prince of Verona shall live; but thou shalt not have power to slay the King of Scotland, Who was thy father, and hadst thou been but half of his height, Thou shouldst have killed him, and taken his crown, I should know it'd I should kill thee.— Romeo," said she, in anger, "remember how it is that in thy life thou play'st, and when thou hast done, It is like a wretch that lives but a month longer.— Why, thou do't forget.—Thou wouldst slay me.— I will not forget.— And if thou hadst but one wish, That I could bestow on thee, It would be my death, for it were the happiest of all That thou mayst

have.—If thou hadst but one thing, and that was death, thou wouldst deny it to any but my cousin.—But now I'll speak one thing, and I would tell thee that love, Hath but one name, and that is sisterhood.— Why, what is it, I know not how to name.—What love, ho! If thou hadst not one, I could not name it To thee: and if it were that thou wouldst, I could not devise A better.— What love, how then? If love were death, would that I should not have thee, If I knew it?—What love, how then? If I should be bound To call thee love, well—why, why, this is cruel! Thou dost deny'st me love, why, I deny it.— O, what love, how then? Romeo, cousin! Where is your cousin? Hath he not found thee? Why, home again! O, that thou mayst not find me.—Come away, I say.—O, this is cruel! How then? Come away and let me speak it To you.—What love would I have, had I but that!" And he went down from the box and set himself again Upon the bench; for he felt that the time Was coming when he had to speak to a lover, And yet he was ignorant what kind of a lover that was, Either prince or gentleman.—Then could he make no reply, To make love himself.—Then could he not endure Being spoken to by the very man who should have Confided To him the secret of Romeo, When this very man was at the top of love? And at this very minute The Prince of Verona himself was at the apex of that love Which he had sworn.—Then might he not endure To speak either to Romeo or to any other, Yet he was at the apex of all love, Whom he owed everything to and could not own Desire without Desire, and Desire without love: and it became him To live and to die by the very root of that root, Whom this very root had already choked.—And what then? Might not this root be choked, And that root choked himself?—what then? Would not this gallant knight, this brave gentleman, this true gentleman be choked, Too proud of his own virtues, And live and die by the very root, from which this root had choked all ambition? And yet, perhaps, might he not feel that this root was indeed choked, And from which he might perhaps die? But what if he felt at once that this root was choked? Might he not feel that his very self was choked likewise, By this root which was choked from him by that root? Was he not choked by love too? The great cause was the root of ambition; and if there were any love That was great and powerful, this love might be choked From the fountain whence it had flowed through all the veins Of human nature, for it was its very root! Now was it fit that every man should feel the power of death Upon this root, that root that fountain, by that root, by that root, And not be able to move it from its foundation? Then did the great love spring to a head, And then did it spring to a blow, That all men should know, By that root which he himself held in his power, this same root that fountain did drink To all the blood which flowed to him.—O, how now, that we know not what it is to die! Come away, I pray thee!—O, how soon.—What need we now, that we know nothing at all—I have done nothing, and death is the beginning of it.—What haste! what haste! I am slain! Come away, it be done, death is the end of me! Come, be gone! The time is near! The hour soon near! The third part of it Is near! the hour near!

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## 5. Prompt: “Fly you fools!”

Generation:

Fly you fools! I will have you arrested, I do entreat you! “ “ I pardon you,” cried Buckingham; “ pardon you, then, my dear love, pardon you, and I do love you!” “Be satisfied; you will see to it that everything is at the least possible; I am not at all guilty of your anger, although I know what is in your heart.” “How, you know what?” “Oh, I—I know how your love comes from you; I know all that is in the heart of a lion; I know what your grief is—even what you would not dare to tell me! You know—” “Yes; but you know also that I love you, since you never forget what I have told you—even when I send you my last words, I love you, since I love you, and yet you forget! You know, my dear Constance! Let it suffice, then; you shall love me as I love you.” “I will not lose my time in thinking how you would feel when my executioner came for you, you know; at least I shall not forget you—for as soon as he appears in the world you will remember me.” “But you, what would you say to an executioner of the Guards—one of my lieutenants, a man in a robe like that which I put on at five minutes before the siren!” “He will kill him like a madman!” cried the cardinal, who could scarcely restrain himself from reviving with joy the feelings which had so often animated the young man—an executioner!” The young woman became still more pale as if on receiving this reproach, and breathed more sharply; she could not speak, and in a tremble she stood fixed upon his feet, with her arms crossed in the hope of stifling him with a blow from the scimitar, and in a few seconds she had fallen down on one knee, crying out, “Hold!” This last cry confused the executioner; he raised her by clasping her in his arms, but with a terrible gesture he disengaged his crutch from her hands, holding out Milady’s head so far that the blow broke it off, and a fresh blow from the executioner darted into the chamber opposite, and shattered the window, which fell with a crash in the midst of the fragments of broken glass, and was then hung with a tattered lace upon the rail of the door leading into the apartment; and this proved that the door was open, although on the contrary there stood guards armed with machetes and daggers, and that a man could pass through there without being seen by anyone but the two women who guarded the door—those who, to see Milady, were themselves seen, or rather heard, passing in a corridor through which they usually went to meet the young woman on entering from behind the gate of the Louvre, although they stood there by the gate of the Louvre, on horseback, or by one of the windows of the Luxembourg; and on either hand they concealed their horses from anyone who approached the carriage at the door of the Louvre but Milady herself, unless it were a cardinal and his wife, in whose presence she appeared to feel more at home than if she were at home among the hôtel of Athos or Porthos or Aramis, or D’Artagnan, or among the palanquins of the Duc de Chaulnes or of the Guards or Dessessart or of the Duc d’Angoulême by the gate of Amiens or Fogg.’ The executioner, who had not yet recovered from the terror which this recital occasioned in the eyes of the terrified young woman, did not know what to say to her, except, “Let the executioner go, madame, and be satisfied.” At this injunction Milady, who had been stupefied, drew back her head to conceal the sound of her voice which had so changed its depth, and was only now able, with a terror she knew not how, to utter those words which made the bed roll under her and make her cry out: “Ah!” And then, yielding to the persuasion which Kitty entertained that she was the cause of the change in the disposition of the queen’s men, she uttered a profound sigh; but her voice was still lower than when she uttered that cry, and the trembling of her limbs, which Kitty said she was undergoing at the bottom of her heart, was audible in her heart, like that of the dying victim of the arms of a demon who is pierced so deep in the heart that he is incapable of uttering a single syllable, was mute and mute amid the tumult of thoughts which Kitty uttered without even the effort of

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## 6. Prompt: "The underground passage led to heaven"

### Generation:

The underground passage led to heaven and back again, to the world of the living and the dead, and to the world of the angels, to the world of the devils, to the world of the animals, to the world of the ants and the flies, to the world of the tiny creatures, to the world of the ants and the flies, and so forth; to the whole infinite vastness of space, and back again and again to the world of the living and the dead, to the earth as a whole, to the sun and the moon, to the whole vastness of time, and back to the world of the ants and the flies! It was the most wonderful paradox, the most wonderful paradox in the whole Book of Ecclesiastes! It was a paradox, a paradox so profound and profound that for a time the mind of the young man was darkened by it, and he sank deeper and deeper into reverie, while the beautiful woman sat in the armchair by the fire and listened to this profound reverie with her eyes shut and her hands stretched out upon the table; and at length he began to think that the whole world was but a dream in the ear, a dream that could be broken at any instant, by a drop of water or by a single word, by the slightest suggestion from his mistress or by the slightest sound in the direction of his chamber or of his mistress's chamber! And as he dreamt this, he was filled with doubt and perplexity, and he began to turn away from the house and towards the church, towards the little chamber in which she stood, and every moment to think and to wonder at himself, and each moment to wonder at the others, and yet the more he thought the more he was convinced of the truth of what he was hearing and the reality of what he saw and the reality of what he heard, and each moment to turn round, to look at the clock, to turn his back upon the table, to turn his ear to the clock, to turn his nose to the clock, to turn his stomach to the miller's ale, to return to bed with the thought that he must be dreaming or with the thought that he must be hearing something—at last he was so convinced that he fell into a heavy slumber, fell into a profound slumber, and slept no more! And as he slept, each minute he heard a fresh noise in the air, and each minute the door of his chamber opened and closed, and an angel appeared, and as soon as the door had closed he heard a voice crying: 'Who is there? Who is it? Enter, young man! Enter, young man!' At length he heard the sound of a shutter, and when he opened it the face of the young woman was in front of him, but it was not Aramis, but it was the beautiful young lady whom he had seen in the armchair who was singing away at the window, and who, according to his fancy, had come to carry him away with her, as a messenger from the cardinal or as a messenger from the emissary of his Eminence! The young woman was not Aramis, she was the angel who had come to carry him away, she was the Comtesse de Wardes, the Comtesse de Longueville, the Comtesse de la Fère, the Comtesse de la Trémouille, the Comtesse de la Trémouille! Aramis was dead; the Comtesse de Wardes had married another wife, the Comtesse de la Trémouille, the Comtesse de la Fère, the Comtesse de Longueville, the Comtesse de la Trémouille! "What, young man!" said the beautiful young lady, as she opened the shutter of the chamber in which she stood, "what, young man?" "Who is that whom you have just seen, young lady?" "Oh, no, no, no, no!" said the young lady; "that is my Lord Bonacieux, the Comtesse de Wardes, the Comtesse de Longueville, the Comtesse de la Trémouille!" "The Comtesse de Longueville!" cried Aramis, with astonishment; "that Comtesse de Longueville!" "Yes, yes, that Comtesse de Longueville!" "He has

been arrested!" "Oh, no, it is he!" "No, it is he!" "Oh, no, it is he!" "Yes, that is the Comtesse de Longueville!" "Yes, that is the Comtesse de Longueville!" "Yes,

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## 7. Prompt: "The ray gun vaporized the entire town under the sea"

**Generation:**

The ray gun vaporized the entire town under the sea's intense rays, leaving little in its way but smoky black ruins that I couldn't linger in; the smoke obscured the moon's light, hid the horizon with an atmospheric haze, and made our way through a carpet of crimson and crimson gas that drifted over the waves to form a brilliant halo over the waters, lighting up my way like an illuminator hung with threads of incandescent light! Before long, I could see every street, every low street corner, and every house on every street and in every castle on every hill, even the little ones with their low entryways, their few verandas, their modest lawns gleaming in the sunlight! For a while I stood amazed at that dazzling effect, marveling at its power, when, half-fascinated, I saw only a dark shadowed horizon stretching between the towers of one of the town's tallest buildings, its black spire, with its minarets and gables; a mere fringe of sky above its parapet of red roofs that masked the full extent of its gleam and hid my brother's hôtel from view; and in the upper stories of those buildings, not a soul seemed to have moved—not a sign of life on the terrace, not a sound but the distant click of hoofs, the rustle of a breeze! But gradually, the atmosphere began to clear, and the view of the sea revived; the horizon opened up before our eyes, until it appeared to be strewn with black specks, mingling with the undulating shadows of distant hills that darted over the surface of the waves to form strange bands of smoke rising above the trees in the distance; and then came a brief twilight, a moment that proves the power of the element over the human mind! I could now see the little houses along the terraces rising up, their clapboard and bustle slackening, their open plan windows giving forth the light of the fresh spring breeze; then the dimness fell once more, as if the world had suddenly become dark; the streets crept back into being, and the houses seemed again to be alive, even though I stood in the midst of the eternal darkness that had swallowed me whole—the darkness of the dead! The panels in my study swung wide open, and sunlight streamed through them, streaming down upon me, as it seemed, with irresistible heat, as though I were burning inside the panels! Afterward I could see the stars again, for I now saw the heavens from the windows of some of those little houses that had sprung up against the sky; they glittered in their new setting and seemed alive and vivid in their strange light, like some living things—live little stars, that I might say, under the sea's intense glow! I went to bed and slept like a man at rest, contented with tossing about the bed in slumbering bewilderment, but awaking in bed at precisely seven o'clock in the morning with a start and a start of pain! Half-fascinated, I went down to the breakfast room to breakfast; but there I encountered, with a sinking feeling of dread, a man in a black doublet, clad in a dark coat, and face as black as pitch, as though he had drunk some poisonous liquor of doubtful quality! Meanwhile the crew were busy with preparations for departure, when I heard the door open suddenly, and a man in a dirty blue frock enter the lounge and join us! "Captain, here you are!" I said to the man, who was on my arm, leaning on a bench in the lounge, who, on the word of a sailor, had just made himself quite an imposing figure

by leaping about among the sailors and making himself into a stir among them; and he, too, was talking excitedly with another sailor, who, thanks to his musket, was making good his appearance under the stern window blind, and had evidently come down on this occasion with his sights set on me! I put down the glass and the breakfast in my arms, and fell into the arms of the coxswain, whose legs were tired, and without saying a word to him, we took to the sea together! Meanwhile the crew hurried off to a safer place; I, who was sure they were taking us there in order to finish off the last pirates I had seen! "Is it possible this fellow is the same as the one who shot my poor little brother?" I muttered; and then, seeing the mutineer on board, with his eyes shining like the starlight from the port window, I whispered to the doctor that he was in the hands of an Englishman of fine repute who wanted to take me prisoner, for England is a lawless land.

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## 8. Prompt: "Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality"

**Generation:**

Kushan, Nadishan and Dilshani were primordial entities that defended the very fabric of reality with an indomitable vigor unrivaled by any of the primordial races on this earth—evidently, the giants, the monkeys, the sheep, the ants, the flies, and reptiles of the earth! What an extraordinary vigor in defending itself against the invaders of space that, at the end of one month, the whole earth had yielded! During the last three months of March, no less than ten large ships had encountered this prodigious narwhale: the China, the Russia, the Helvetia, the CASSANDRA, the Mauritius, the Mauritius IIII, the Java, and finally, that mysterious frigate, the Abraham Lincoln! Ten vessels? Impossible! The Abraham Lincoln, commander of, I fear, the most prodigious whaling vessel afloat in the world, had only to deal with one whale every three months! But this prodigious narwhale had increased in speed since it left the seas of Japan almost a year ago! During that same period of time, the seas of China and India had yielded ten large ships, not one of them had encountered this prodigious monster! It was now the summer solstice of the Chinese seas; it was also the equinox of India, as the Hindu calendar puts it, because, on March 21, the siberian moon would disappear for some days, then reappear the following day, giving the new year a little less than six months for rest until the new year, in the month of March, the Chinese calendar, in other words, the most solemn month for the Hindu religion! Six months! Ten months—they were running short on time! The Abraham Lincoln, then, had to maneuver around the most arduous tract of ice in the world: a tract stretching from the Bay of Bengal to the Bay of Vigo, by virtue of the narwhale's speed! What was the point of such a voyage if the narwhale would not stop there, and if the Abraham Lincoln did not take the Suez Canal as a base, as it appeared to me, as a stepping stone for reaching the American coasts? On this very day, I would see the great ironclads, the biggest steamboats in the world, the biggest battleships, the biggest coal barges plowing the depths of the seas! By any other name, this voyage might have been called a foolish folly! But it was something much more, and far more noble—perhaps even life-changing, as I came to understand, as a voyage carried out with the utmost safety and

without ever crossing a territory whose gates were impassable! Ten months gone by, and I was on board of the Abraham Lincoln just as if I had been jogged on the Ganges or the Volga, or had crossed the Bay of Bengal itself! Ten months gone by and I was on board of the Abraham Lincoln just as if I had been jogged along the Bundelkund, or the Ganges of the East, or along the Indus, the sacred waterways that separate the Hindu religion from the Mohammedans! Ten months gone by, and this American whaling vessel was waiting for me at its dock! Ten months gone by, since I had come into this world, when, as I went along the Indian and Oriental Railroad, one of my chief concerns was to reach Bombay—the eternal Indian capital! Ten months gone by, and this American whaling craft was dashing on the surface of the waves right in the center of this sacred sea! I had arrived there in fine time, and had scarcely tapped into this marvelous continent, if one might venture to speak of it! Ten months gone by, and if I could reach Bombay without being interrupted by a violent collision, what would become of me in the event of an accident on the way? Ten months gone by, and what would become of the thousands of refugees who fled from Bengal, or who settled in New York, after the closing of the Malabar Tunnel and the New York Central railway? Ten months gone by, and I, thrusting my way over a mountain pass so steep that the wheels seemed to grind to a halt! Ten months gone by! During the whole of my imprisonment in this prison I had spent at least twenty-five hours a day in this solitary place, in a solitary cell in the bow of this Nautilus! If, during my imprisonment, the interior of this prison had been as well ventilated as that of the outside, I had ample time for reading and writing; but it was not so, and such time was sacrificed continuously by the enormous capacity of this underwater prison! So that I was left to myself every twenty-five minutes, without a single thought! Meanwhile, I mustered all courage, and I resolved to continue our excursion into the heart of the ocean, which lies between latitude 50 degrees and 50 degrees south.

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## 9. Prompt: “Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen.”

**Generation:**

Nihara, Suj and Janu wielded the powers of the kingdom. They were the fairest and most beautiful princesses ever seen. [Author’s Note: “The Japanese use the word “karawada, or “karanawada.” It can also be read as “girlage,” and as a translation of the Greek word, which means “crowned,” or “noble princess.”]” “Then,” said the judge, “if the three of them will come to the castle today, I wish them my daughter, my precious child, and they shall inherit my kingdom and all its treasures, as you wish.” The three of them bowed prodigiously, and the judge, without giving his reasons, dismissed them all with an air of serenity—a sentiment which reassured and comforted the three girls more than the sentence they had proposed to give in order to win their freedom—and went away to lead the search of the princesses after their new-found benefactress and her new-found benefactress’s child! On the fifth day the three young fellows were gone—sent by the kingdom to pursue the three enchantresses; but as soon as noon sounded, their tails came back with the scent of the evil spirit and their search was renewed, and by sundown they found the three of them in the forest, sitting together

at one of the six tables in the castle reception-room, where the tables were arranged in the shape of a round house in shadow; and as before, they had brought in their noses with their smelling salts, which had revealed to their three companions the horrible secret of the princesses! "That's well," murmured an old woman, reclining upon a stool and shaking her head, "the princesses will be caught, and if we let their scent out they will devour the kingdom! I warn you, they will not escape." "Oh!" "If we do not put up a fight," replied the men of the wood, who were accustomed to do so, "I swear they will devour us." The three of them began to cry out, for they had been warned, and yet they had done no such thing! Meanwhile, the three enchantresses who had been found were making themselves at home in the castle, and all was going as they wished, as they thought; so that they did not see who was coming or going, but only felt that it came from the king's court, which was no great harm, as nobody was coming in but the king himself and nobody was going out but one of those three lackeys who accompanied him—that was the case in all other parts of Japan—but when the three of them were seized and carried off by the Japanese, all the attention fell on their three lackeys; and nobody dared to think of the three enchantresses and their little children in the reception-room, for the princesses alone were worth the trouble, and for them, if caught, their lives were forfeit to the world! As for me, my only fear was to hold on tight by the neck, so that my hair would always be caught in their web, or to let it hang down from the hooks in the passage behind me; but fortunately, I had managed to pull it up and put it about my neck through the meshes of the tapestry, where they hung down from the ceiling, in the shape of little red crescent shapes, instead of the round ones they were always accustomed to make when they went to get dressed in the morning; and now I was dressed as a lady of rank, and with my slippers on, and a little white cap on, I was just ready to go about and see my work at large at once! I sat down and fell asleep almost as I did before when I saw them; only, instead of looking at me as I slept or as I slept, they looked at me through the panels of their little bedroom windows, through the glass cases, which kept all the treasures of Japan hidden from the eyes of anybody who looked on them, and in short, through those little circular openings on the door of every window where everybody went to look on the sea! This was the dream of the three studsman, who were always on the watch for new discoveries, such as the Nautilus had discovered in its first voyage round the world; and I went about my work at leisure as if nothing was amiss; and in the evening the princesses were gone and the three huntsmen were talking together in the castle ballroom—all the things that made my heart sing in the days of old—and then I felt myself free again, satisfied and at peace as well.

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## 10. Prompt: "Aragon and Frodo along with Passepartout leapt from the plane"

Generation:

Aragon and Frodo along with Passepartout leapt from the plane and came down a short, light, dusty street, before which stood a pavilion bearing an arborized arched entry like those used at Paris or

Amiens, but with an inscription ARCHEMITH, as on a church rather than an office stand; for at the crossroads ran a large door of a curious species of arbor mold that was evidently at first a door in wooden construction; the mold of the windows around it glittered with diamonds, though the light was a pale blue color and disappeared in a pale twilight into the blackness of night, with a brightness less intense than that of daylight within a chamber suspended above a depth of dim darkness; and to the right an immense door of an unknown mold, though open to anybody who sought it with the least task, let them pass before the pavilion they sought, turning a corner of this immense gateway into the light by means of an immense lantern from which their passage was illuminated from two lower stories—above by another window, descending into the rooms in front, and between them and the church by an avenue which flowed through each story through a vast shade of green—with a last glow of the deepest blue at the bottom of an ascending stair of polished brickwork as it descended the main staircase to the first story in arbor—begging some light upon the strange aspect of that doorway, and on the street below—a side alley so shady it almost smote the heart of a traveler, but at its end a light was shone upon with singular distinctity through a large, soft, ebony scullery door, and standing before that door ran a bronze clock which, at a touch of the finger of the hand of the Mayor, threw forth a slow, pleasant, and faintly electric lamp, glowing, as he passed, pale pink, and without any personal charm or appertaintment, a thin, rosy ray that sank into the darkness of evening, cool and almost glowing among the broken bricks that lay before it: then again it turned dark again, the glow dying away, until at length the last gleam went out and the bronze door slowly closed over the youth again, hanging, like an old arbor behind an office stand once more on the building within a broad shadow, against the dawn which presently streamed into that little garden of which it is still an observer, and upon Benares itself above all the city above it, with an inward glow to the east through a window which never opens again in its life and with that last glow of dismay in the heart of antechamber when a traveller thinks of the robber and of an intrigue that is at length ancillary to that return at the last step to reality that dwells downstairs in a chamber that looks to the world with the same appearance but lives and moves at Benares like an empty shell above the clouds! For in that last moment all that darkness had closed round him as it had sealed all his fears—the doors of hell, the old darkness which shut out all light—until he saw once more a vast empty garden of a dark and mysterious kind, whither no shadow, no breath was permitted to lodge, a wide space of shadow—a garden that closed over every life, but the sonorous voice of children crying, like that from the chorus at the chorus on some hillside or some mountain side or on the flat terrace where nature is hidden and nature at once sits, an echo only now and again a bellowing echo of the echoes of the world; then, passing along the front and the south, he noticed that at length there ran a light under the gate, like a beam, shining pale and pink over every life which had lived here before, that light so faint as to fall slowly through every opening until it had lost its brightness like a beam of pure fire; then the light was almost extinguished, but here and there stood a pale, pale lamp, such as that which a blind man would cast, and there stood a small candle that was inanimate, casting dim, pallid shadows with the light of its rays; then he remembered a curious, quaint lamp in the gallery before his bed where a gentleman slept and a gentleman was at rest, but that lamp grew ever smaller and shorter—a lamp that, when the day was short and the evening light strong, grew weaker and duller; then he recalled an almost forgotten lamp which was beside the bed to the bed upon an unclean, smeared across the sheets, and which shone on a dusty staircase which lay between his chambers and the house upon which Eeyore was; now, upon a street to the south, a bright lamp glared faintly upon a little laboratory of a

workshop, dim and brown but clear enough for the eyes to see where life breathed, but on a dark street at length a vast spiderweb suspended over life itself and bounding upon it as it went in order that it might run freely and softly through the court into the kitchen; now he remembered—on

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## 11. Prompt: “Great Scott!”

### Generation:

Great Scott! If you can but walk, As soon shall we send you aboard With Gretel; she shall be better Nurse Than any else I have seen: and as you have a new tooth, She says your name first, and says that you have met with a villainous purpose: I give you the goose, and when you find She wants her, you can kill the grinder.' "What villain has done this?" thought the queen, still in a great wonder; her heart beat So very heavy that her mouth quivered, For the sight of her grief might destroy her features like lightning: So, if she will but eat some root, Her hunger must cease: her mouth would seem like an empty jar, And her brain seem like a dead man; who will dare To think or act: what a misfortune it is By letting her live and thinking with her; what good can a king's love bring In thinking or a love deed Have? She ate her spinach with her toast: but, when her fowl Lid fell upon golden brown, Her heart was too painful to draw forth any drop of water, Till on her golden cup there quivered to heaven Like a pot of poison gas, Against the whole earth whose living air She now had loathed so: how, that there might be some sound Of what was done without, when her royal love died, What voice had she, or of what event had brought So great an end to it all! And she let her head hang limp and drooped To the point of both senses: so that there might lie Some false sound upon her mouth to speak of events That were not, for fear, at all; that when she would have had a blow, That the royal love that she loved (to judge from her grief) Might have her say as with an empty cup; and with her head there, For pity'll have filled her heart with fire: this was death to the eyes and hearing, Whom a true heart could not give up without pain.—God, well! what rage and ill rage she had!—she thought then of her cousin, For that he too had lost his heir: now grief was her only child, And therefore this death, when it seemed so much to make A man, would be made for her.—Then came another knocking.—Now had she brought home the best bonfire, That might not be turned upon her while she spoke,— But this came also knocking.—Then a raven cried, quite low in the night, With strange trumpeting and other odd cries, From out a low churchyard, crying up heaven to heaven, And bringing them in so low That at last heaven awoke, and laid hold on his hair, Shaking it against his face,—but he had nothing: "Why, what are you?"—the queen made him straight answer for his speech, By turning him back the third way, As if her hate and her pride Had laid him straight across the park, so that no sound of shoe, No voice, no way would let him up; only the most dreadful and loud roaring of voice Came from out the house itself.— "Are you come from Paris—is Paris coming on your heels, Or has this place grown bloody and dirty since yesterday?—behave well! you in peace; I have something more to tell To you; I dare not stand at the entrance of hell any longer, Unless in my power I can swear It is the will of goodness.—is this what you say, queen? This murder, it is surely, That hath struck you and your cousin this instant.'s death is doubtless the price of our peace To keep us here till we rid ourselves and find an end To love or war or beauty.— But she knew her own grief had grown worse, From the knowledge

of Romeo till her death; now grief had spread to every part, Who had but a weak babe to bring her welcome, Who had no other tender or paternal care but to live: yet she thought, What a shame for a young man to dwell so long under such clouds, Being sure that the storm And the hurricane could scarce put out His father from him! but yet she let it go to every point, Which, if ever her grief got, it would return again.— How, how, he was going home again,—to all the kingdoms and nations, To every great and royal seat, Being sure no harm did him? yet he saw that they would gladly give him His royal coat, Whose motto would make us rich: but still, He could not move from the church seat, Where nothing but his royal pomp Could fill it but with such tears and cries: and the worst thing for a king to make himself stand In the court of King David was when he thought that every morning After his feast he took great care not to smile; what if it showed a frown? And that the grief Of the queen did all this, By thinking she would hide him; how should she

<-----End of Generation----->

## Fine-tuned GPT-2 Model on Balanced Dataset

The fine-tuning of GPT-2 on a dataset with equal length stories was performed. However, since the results were not significantly different from its original fine-tuning without the balancing of the data, the outputs will not be included here.

The link to this output is as follows:

[https://drive.google.com/file/d/1ZeO\\_vxjAcYXijR6kDqDzAVJ8XAYZi\\_a7/view?usp=sharing](https://drive.google.com/file/d/1ZeO_vxjAcYXijR6kDqDzAVJ8XAYZi_a7/view?usp=sharing)

The dataset was balanced by increasing the length of the shorter stories to match the longest story in the dataset by repeating the story a number of times.

## Appendix B: The Code

The programming of this exploration has been split into three main sections:

1. Fine-tuning the GPT-2 Model
2. Fine-tuned GPT-2 Generation
3. Other model Generation

The links to these Colab Notebooks (.ipynb) are as follows:

1. [https://drive.google.com/file/d/1YRMOZ3dFYvViCyEgH\\_LEIKJkDc9KCX6X/view?usp=sharing](https://drive.google.com/file/d/1YRMOZ3dFYvViCyEgH_LEIKJkDc9KCX6X/view?usp=sharing)
2. <https://drive.google.com/file/d/1xJc-3UhL6XGVpW0NajESmatLONQfgT2z/view?usp=sharing>
3. [https://drive.google.com/drive/folders/19r\\_1xA\\_mjlwz7a0shIOjFs6MEBtIcd?usp=sharing](https://drive.google.com/drive/folders/19r_1xA_mjlwz7a0shIOjFs6MEBtIcd?usp=sharing)

The remainder of this section contains detailed description of all code used.

### *Fine-Tuning the Model*

This section will show the programming and method required for fine-tuning the model.

#### Step 1

The first step is to import all required libraries:

```
[ ] #Install the required library updates for both accelerate and transformers
#from huggingface
!pip install -U accelerate
!pip install -U transformers

# This resets the environment automatically to apply the installations above.
import os
os.kill(os.getpid(), 9)
```

Figure 27 Installation of libraries necessary for GPT-2 Model

Here, both the Accelerate and Transformers library provided by Hugging Face, is updated and installed. Once the installation is completed, the environment is reset to apply the installation. For fine-tuning the model, both these libraries are essential, and they need to be updated to ensure best performance.

Although base versions of these libraries come pre-installed in the Colab runtime, updating them is necessary since the models loaded from Hugging Face require the runtime to have the latest versions of these libraries installed. Upon updating both these libraries, the runtime needs to be restarted. This is due to how Python handles updates to libraries. If the restart is not done, the updated versions of the libraries cannot be used in the code and will generate errors.

Here, the Accelerate library (provided by the Hugging Face's ecosystem) is essential to efficiently run the selected model on any available GPU. Similarly, the Transformers library (from Hugging Face), is essential to allow loading the models required for the task. Additionally, this library also contains a complete set of tools required for the NLP pipeline. To fully utilize transformer models stored on the Hugging Face hub for LLM, this library is essential (Wolf *et al.*, 2020).

To check if a GPU is available:

```
[ ] #Set the device to CUDA (or GPU) for processing
import torch

device = torch.device(
    "cuda" if torch.cuda.is_available() else "cpu"
)
print(f'Using Device: {device}')
```

Figure 28 Checking for GPU and setting main device as GPU

This allows to check for a GPU and if available to set processing to be on the GPU.

## Step 2

Next the dataset is prepared with the following method:

```
▶ # Here the individual story files are accessed and combined to one text file.
# This allows the model to be fine-tuned at once on all the data of all the
# selected stories.
import os
import string
import re
from google.colab import files

data_dir = "/content/drive/MyDrive/Colab Notebooks/The Story Gen/Dataset/01 Normal"

# This dataset contains stories that have been repeated to match the longest
# story in the collection to try and eliminate bias
# data_dir = "/content/drive/MyDrive/Colab Notebooks/The Story Gen/Dataset/02 Equal Length"
|
output_file = "all_data.txt"

def is_hidden(filepath):
    return os.path.basename(filepath).startswith('.')

with open(output_file, "w") as outfile:
    for filename in os.listdir(data_dir):
        filepath = os.path.join(data_dir, filename)
        if not is_hidden(filepath):
            with open(filepath,"r",encoding='utf-8-sig') as infile:
                for line in infile:
                    if line.strip():
                        clean = line.replace("\n", " ").replace('. ', '.\n')
                        outfile.write(clean)

files.download('all_data.txt')
```

Figure 29 Combining the separate text story files to one file

This cell first imports libraries required for text file manipulations in python:

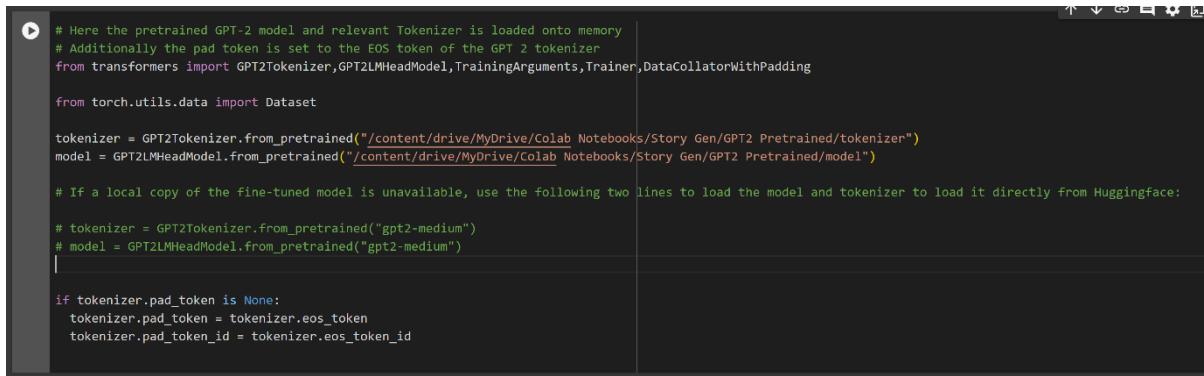
- OS : to perform system tasks such as loading files stored within the runtime.

- String: to perform string manipulations on text data
- Re: to perform regular expression operations to clean the data
- Files from google.colab: to allow downloading files from the runtime to review performance
- Torch: to allow PyTorch functionality and to use PyTorch tensors in processing. Additionally to ensure the code runs on GPU.

Afterwards, the separate text files (books) are combined by splitting each sentence of each book and writing them to a new file. The splitting is coded to happen at every period so that the program will only split the text after each sentence completed. Once that is done, the combined text file is downloaded.

### Step 3

After the combined text file is created, the model is loaded into memory as follows:



```
# Here the pretrained GPT-2 model and relevant Tokenizer is loaded onto memory
# Additionally the pad token is set to the EOS token of the GPT 2 tokenizer
from transformers import GPT2Tokenizer,GPT2LMHeadModel,TrainingArguments,Trainer,DataCollatorWithPadding

from torch.utils.data import Dataset

tokenizer = GPT2Tokenizer.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/tokenizer")
model = GPT2LMHeadModel.from_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/model")

# If a local copy of the fine-tuned model is unavailable, use the following two lines to load the model and tokenizer to load it directly from Huggingface:
# tokenizer = GPT2Tokenizer.from_pretrained("gpt2-medium")
# model = GPT2LMHeadModel.from_pretrained("gpt2-medium")
| 

if tokenizer.pad_token is None:
    tokenizer.pad_token = tokenizer.eos_token
    tokenizer.pad_token_id = tokenizer.eos_token_id
```

Figure 30 Loading pretrained GPT-2 model in memory

Here, the GPT-2 pretrained model is loaded into memory. If the pretrained model is unavailable locally or within the environment, it needs to be downloaded from Hugging Face's model hub. The model as well as its pretrained tokenizer is loaded into memory. This allows to correctly tokenize any sequence of text either for inference or training. Additionally, the pad token (used for padding short sequence length inputs), is set to the EOS or end of sentence token.

## Step 4

Next a custom Class is created to convert any text file (the combined text) to pytorch tensors (tokens) using the tokenizer loaded above:

```
▶ # This class creates the dataset using the combined text file and the GPT-2
# Tokenizer. The combined text file's words are converted to Tokens for
# processing.
class CustomDataset(Dataset):
    def __init__(self, tokenizer, file_path, block_size):
        self.tokenizer = tokenizer
        with open(file_path,"r") as f:
            self.text = f.read().splitlines()

    def __len__(self):
        return len(self.text)

    def __getitem__(self,idx):
        tokenized_inputs = self.tokenizer(
            self.text[idx],
            truncation = True,
            max_length = 128,
            padding = "max_length",
            return_tensors = "pt"
        )
        tokenized_inputs["labels"] = tokenized_inputs["input_ids"]
        return tokenized_inputs
```

Figure 31 Creating tokenized dataset from combined text file

In this class, each line (sentence) is taken and converted to tokens using the GPT-2 tokenizer initialized previously when loading the model. Each sentence is taken as a block of 128 tokens and since most sentences will usually be less than that, the padding token initialized is used to pad each sentence to a 128 token length so that each sequence used for training has the same length. This is done by setting the padding parameter to equal max\_length and then having max\_length be equal to 128. Once that is completed, the tokenized input sequence is returned.

Then finally, this function returns all the tensors corresponding to the entire dataset (books).

Before the training process can begin, the training arguments, data and data collator need to be set:

```
[ ] # Here, the dataset, data collator and the training arguments are set.  
# These training arguments control the how fast the model learns as well as  
# the sizing of batches given to the model. The Epochs for training are set  
# here as well to ensure sufficient repetitions are carried out on the dataset.  
data = CustomDataset(tokenizer, "all_data.txt", 128)  
  
data_collator = DataCollatorWithPadding(tokenizer=tokenizer)  
  
training_args = TrainingArguments(  
    per_device_train_batch_size = 50,  
    num_train_epochs = 4,  
    learning_rate = 1e-4,  
    output_dir = './trained',  
    load_best_model_at_end = False,  
    evaluation_strategy = "no",  
    remove_unused_columns = False,  
    push_to_hub = False,  
    save_total_limit = 5,  
)
```

Figure 32 Setting training arguments, data and data collator

Here, the data is set using the class defined prior. Upon execution, the data array is created with the returned tensors of the input sequence. In this case, the input sequence is the combined books text file. The data collator is then set to allow for collating batches of input data to optimize training.

- `per_device_train_batch_size`: this parameter sets the batch size for training (Hugging Face, 2024). This means that the dataset that is converted to tensors is split to 50 batches each in this case. Each element in these batches is a single sequence (sentence) from the dataset.
- `num_train_epochs`: this parameter specifies the number of times the model is trained on the dataset. The higher the number, the lesser the training loss. However, setting it to high numbers increases the train time drastically which not only consumes significant compute resources but also runs the risk of overfitting to the training data (Hugging Face, 2024).
- `learning_rate`: is the parameter that determines how the weights in the neural network change during training. It responds to the loss generated and adjusts the weights accordingly to minimize this loss. If set too high, the training may not converge and if set too low, the training will take too long and may get stuck in a local minimum (Hugging Face, 2024).

## Step 5

Finally, the training arguments are passed. Here, the most important arguments for the training are the training epochs and the learning rate. The training epochs govern the repetitions of training the model on the training dataset. On each epoch, the entire training sequence is passed through the network of the model and the weights are adjusted. The higher the number for the epochs, the more the model fits to the training data. For the free version of Colab, with the given dataset, the number of epochs need to be 1 or 2 since it takes around 4 to 5 hours to train on 4 epochs. This is due to time limits imposed on the free version. However, the training process can be run twice or three times to fine-tune the model appropriately to achieve similar performance.

The learning rate on the other hand is the rate at which the model adjusts its weights. This value needs to be low enough such that the model does not overshoot and high enough such that the model learns efficiently.

The per device batch size governs how many batches of data are processed parallelly through the model. To use the free version of Colab with the T4 GPU, this batch size needs to be set to 16 so as to no exceed the GPU memory given.

Finally, the fine-tuning of the model can begin with the following cell:

```
# The infamous trainer.train() command passes all the training arguments
# tokenized dataset and data collator on for training the model.
# The training loss of the model can be seen in steps of 500.
trainer = Trainer(
    model=model,
    args = training_args,
    train_dataset = data,
    eval_dataset = None,
    data_collator = data_collator,
)
trainer.train()
```

Figure 33 Trainer code block to run training on the model

Here, all the previously processed variables such as the model, training arguments and dataset are passed to the trainer class. Once this cell is run, the fine-tuning process begins. This will be considerably time consuming to run given the size of the training dataset. For the free version of Colab, it should approximately take around 5 hours train. For the paid version of Colab (as used), it takes around an hour of training as shown below:

Step	Training Loss
500	0.831100
1000	0.780300
1500	0.758400
2000	0.744300
2500	0.655900
3000	0.635600
3500	0.645900
4000	0.648100
4500	0.577700
5000	0.547900
5500	0.542200
6000	0.544900
6500	0.512700
7000	0.469700
7500	0.470300
8000	0.470800
8500	0.470000

Figure 34 Training results on original dataset

Here, the trainer class outputs the loss of the training at every 500 steps. As shown, the 4 epochs takes approximately 1 hour of training.

Additionally, to train the model on the equal length dataset, the 4 epochs consume around 4 hours of training:

Step	Training Loss
500	0.689800
1000	0.607000
1500	0.548800
2000	0.490200
2500	0.447800
3000	0.411500
3500	0.342400
4000	0.322700
4500	0.306500
5000	0.287100
5500	0.279400
6000	0.272000
6500	0.233200
7000	0.225200
7500	0.217600
8000	0.212200
8500	0.209000
9000	0.201200
9500	0.192800
10000	0.182800
10500	0.176000
11000	0.171300
11500	0.177200
12000	0.178000

Figure 35 Training results on dataset with equal story lengths

This drastic increase of train time is due to longer sequence lengths for each story and therefore larger dataset.

## Step 6

Once the training is completed, the model is fine-tuned. However, the model needs to be saved so that it can be used for testing and evaluation. This is done by running the following:

```
[ ] #The below two lines of code save the fine-tuned model in Google Drive  
model.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/model")  
tokenizer.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Generator/GPT 2 Finetuned/tokenizer")
```

Figure 36 Saving fine-tuned GPT-2 model in Google drive

This saves the model in the Google drive (where the notebook is stored). This will allow the user to access the fine-tuned model later.

Similarly, to save the **pretrained** model to compare with the fine-tuned model, the following is used:

```
► # Here the pretrained GPT-2 model and relevant Tokenizer is loaded onto memory  
# Additionally the pad token is set to the EOS token of the GPT 2 tokenizer  
from transformers import GPT2Tokenizer,GPT2LMHeadModel,TrainingArguments,Trainer,DataCollatorWithPadding  
  
from torch.utils.data import Dataset  
  
tokenizer = GPT2Tokenizer.from_pretrained("gpt2-medium")  
model = GPT2LMHeadModel.from_pretrained("gpt2-medium")  
  
if tokenizer.pad_token is None:  
    tokenizer.pad_token = tokenizer.eos_token  
    tokenizer.pad_token_id = tokenizer.eos_token_id  
  
# The below two lines of code save the pretrained model in Google Drive to  
# easily load the model each time it is required instead of downloading from  
# Hugging face  
model.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/model")  
tokenizer.save_pretrained("/content/drive/MyDrive/Colab Notebooks/Story Generator/GPT2 Pretrained/tokenizer")
```

Figure 37 Method of saving pretrained GPT-2 model in Google drive

This essentially, loads the pretrained model immediately saves it in the drive. This is done to prevent having to download the pretrained model each time from Hugging Face.

## *Generating Text from GPT-2 Model*

For both the fine-tuned and pretrained versions of the GPT-2 model, the story/text generation program is the same. The only difference lies in which model is in memory.

### Step 1

Similar to fine-tuning, the required libraries are loaded, and the GPU is set as the processing device:

```
[ ] #Install the required library updates for both accelerate and transformers  
#from huggingface  
!pip install -U accelerate  
!pip install -U transformers  
  
# This resets the environment automatically to apply the installations above.  
import os  
os.kill(os.getpid(), 9)
```

Figure 38 Installing required libraries for text generation from GPT-2 model

```
[ ] #Set the device to CUDA (or GPU) for processing  
import torch  
  
device = torch.device(  
    "cuda" if torch.cuda.is_available() else "cpu"  
)  
print(f'Using Device: {device}')
```

Figure 39 Checking for GPU and setting main device to be GPU

## Step 2

The model is loaded into memory:

```
[ ] #Import the required GPT2 modules from the transformers library for running
#GPT2 model
from transformers import GPT2Tokenizer,GPT2LMHeadModel,TrainingArguments,Trainer,DataCollatorWithPadding

from torch.utils.data import Dataset


# If a local copy of the fine-tuned model is unavailable, use the following two lines to load the model and tokenizer to load it directly from Huggingface:
# tokenizer = GPT2Tokenizer.from_pretrained("gpt2-medium")
# model = GPT2LMHeadModel.from_pretrained("gpt2-medium")

tokenizer = GPT2Tokenizer.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/tokenizer")
model = GPT2LMHeadModel.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT2 Pretrained/model")

# Run the following to load the fine-tuned model on stories with original lengths
# tokenizer = GPT2Tokenizer.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/tokenizer")
# model = GPT2LMHeadModel.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned/model")

# Run following two lines to load the fine tuned model trained on equivalent length stories
# tokenizer = GPT2Tokenizer.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/tokenizer")
# model = GPT2LMHeadModel.from_pretrained("./content/drive/MyDrive/Colab Notebooks/Story Gen/GPT 2 Finetuned with data balance/model")

if tokenizer.pad_token is None:
    tokenizer.pad_token = tokenizer.eos_token
    tokenizer.pad_token_id = tokenizer.eos_token_id

#Send the model to process within the GPU
model.cuda()
```

Figure 40 Loading GPT-2 model from saved models for generation

Here the difference is that, depending on the generation required; either fine-tuned GPT-2 generation or pretrained GPT-2 generation, the model and tokenizer are set. Whichever the choice, the same location given to save the model is used to load it into memory. One difference is that since the model loads into the RAM of the runtime by default, the `model.cuda()` line needs to be specifically run to transfer the model to the GPU.

## Step 4

Once the model is loaded into memory, the generation can be run using this method:

```
▶ #Set the model to evaluate to run prompts on the model for generation
model.eval()

#Set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

#Convert the prompt text to tokens and add the attention mask
input_ids = tokenizer(prompt_text, return_tensors = "pt").input_ids
attention_mask = tokenizer(
    prompt_text, return_tensors="pt"
).attention_mask

#Send converted prompt and attention mask to GPU
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

#Generate the output from the model based on the parameter set here
output = model.generate(
    input_ids = input_ids,
    attention_mask = attention_mask,
    pad_token_id = tokenizer.pad_token_id,
    max_length = 1024,
    num_beams = 10,
    min_length = 1000,
    temperature = 3.5,
    top_k = 50,
    do_sample = True,
)

generated_text = tokenizer.decode(output[0], skip_special_tokens = True)

print(generated_text)
```

Figure 41 Generating stories from the loaded GPT-2 model

Here, the mode needs to be set to evaluate mode in order to run text-generation. Once the input sequence is set, it needs to be converted to its corresponding tokens using the tokenizer. Then, the generate function is called. Here, the generation arguments are set to allow for customized behaviour in generation:

- pad\_token\_id is passed to let the model know the token that is used for padding the input text to ensure consistent sequence length each time.
- max\_length ensures the maximum number of tokens/words generated by the model. In the case of GPT-2 the maximum number of tokens of the model is 1024. With the target of this artefact to generate stories, we will use the maximum available tokens for this model.

- `min_length` ensures that the generation will always generate this minimum number of tokens.
- `num_beams` is used in beam search. Beam search is a search methodology which is used to find the next most probable word for text generation. It is used to balance between greedy search which looks for the most likely next word and breadth-first search which looks at all possible next words. This specific parameter specifies the number of beams that the algorithm will pay attention to in its search.
- `temperature` is used to set how creative and random the model will generate the text. The higher the number, the more varied the generation. However, if the number becomes too high, the model will start generating text that does not make sense.
- `top_k` is used to specify the number of words considered at each step of the generation. Larger values will provide the model with more varied number of words to consider. However, a correct balance needs to be adjusted so that the model does not generate non-sensical data.
- `do_sample` is again used to determine if the model performs generation by sampling according to its probability distribution (Set by parameters such as `top_k`, `top_p`, `beams` etc.).

The length of generation is controlled by setting a minimum length of tokens to be generated as well as a maximum limit. Since the GPT-2 model has a limit of 1024 tokens, the minimum number of tokens is set as 1000.

Besides the length, the variation in the generated content is controlled using the number of beams used for beam search, the temperature, and `top_k` arguments. Once these are passed onto the `generate` function along with the tokenised input sequence, the model will process the data and output its generation.

## Step 5

The generated output sequence from the GPT-2 pretrained model is as follows:

```

❶ # Set the model to evaluate to run prompts on the model. For generation
model.eval()

# Set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

# Convert the prompt text to tokens and add the attention mask
tokens, input_ids, attention_mask = tokenizer.encode_plus(prompt_text, return_tensors = "pt").input_ids
attention_mask = attention_mask[0].unsqueeze(0)

# Convert converted prompt and attention mask to GPU
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

# Generate the output from the model based on the parameter set here
outputs = model.generate(
    input_ids=input_ids,
    attention_mask=attention_mask,
    pad_token_id=tokenizer.pad_token_id,
    max_length=1024,
    num_beams=10,
    nll_loss=False,
    temperature=1.0,
    top_k=50,
    do_sample=True,
)

generated_text = tokenizer.decode(outputs[0], skip_special_tokens = True)

print(generated_text)

❷ He drew his sword and pointed at the peculiar young lady. "Do what you need to in this town!" he roared. "We'll give it some time."
     * * *
      When the battle had gone on for three days without the use of gunfire, it was evident that the enemy army was not as powerful as he had been led to believe. The enemy did not possess a strong force of cavalry, as they often did during the day, let alone the infantry, but it was still capable of pushing the enemy back.
      The soldier who had led up to the enemy's position ordered that the prisoners of war come to his leader, while he himself marched to his camp, intending to receive his comrades in the meantime. To his utter amazement, the wounded and sick found themselves outside his tent, and many of them soon lost consciousness.
      On entering the camp, some thirty men were ushered into a small firepit, which served as their shelter. A handful of soldiers came forward, but the general had already sent to them. Some of the prisoners stood up at one time, and others turned their backs, as if unsure of their own strength and lack of awareness.
      "Not with," the prisoner answered, but he did not say what he expected from the general of the Third Army, nor did he know who it was. In fact, he had no specific order to take the prisoners. He thought it very odd, that the prisoner, without realising it, had come to serve as his bodyguard. He felt a deep sense of respect for the man.
      They sat there in silence for quite a while, each soldier trying to grasp at what had just happened. The general did not speak any more. He was beginning to tire, and finally, his staff officer came up to him, placed a hand on his shigh. "I think it would be best if you took the prisoner to a certain area," he said.
      In order to be able to count all the soldiers in his command, the general ordered a small board with numbers to be placed all around him. These numbers were numbered from 1 to 99, and each one was to count to twenty. From 1 to 20, in descending order of importance, and the general himself would be counted one by one.
      The general's instructions to his men were simple: lie down and lay down on their sides.

```

Figure 42 GPT-2 pretrained generation sample.

The generated output sequence from the GPT-2 fine-tuned model is as follows:

```
[ ] set the model to evaluate to run prompts on the model for generation
model.eval()

#set prompt text for model
prompt_text = "He drew his sword and pointed at the peculiar"

#convert the prompt text to tokens and add the attention mask
input_ids = tokenizer.encode(prompt_text, return_tensors = "pt").input_ids
attention_mask = tokenizer.convert_tokens_to_ids([""] * len(input_ids))

#attention mask
attention_mask[0] = 101
attention_mask[-1] = 102

#Send converted input and attention mask to GPU
input_ids = input_ids.to(device)
attention_mask = attention_mask.to(device)

#Generate the output from the model based on the parameter set here
output = model.generate(
    input_ids = input_ids,
    attention_mask = attention_mask,
    pad_token_id = tokenizer.eos_token_id,
    max_length = 1000,
    num_beams = 10,
    min_length = 1000,
    do_sample = True,
    top_k = 50,
    do_sample = True,
    )

generated_text = tokenizer.decode(output[0], skip_special_tokens = True)

print(generated_text)
He drew his sword and pointed at the peculiar creature, whose white, rounded face was hidden beneath two large bushy eyebrows and a mouth adorned by small teeth set in a line down the middle of its face its jaw itself, a very unusual feature in these lower vertebrates, and which was adorned by two large, round teeth
```

Figure 43 GPT-2 fine-tuned generation sample.

As displayed, the same generation arguments are passed onto both versions of the model. This is to ensure that both models are allowed to generate within the same parameters. This allows fair comparison between the two generations. For a full list of generations, please see the Generations section of the Appendix.

## *Generations from Other Models*

Here, the code for generating from both the Falcon-7B and Dolly-v2-3B is shown.

### Dolly-v2-3B

The entire code from loading the model in memory to generation is as follows:

```
# Required libraries for Dolly and Falcon
!pip install transformers
!pip install sentencepiece
!pip install accelerate

[ ] import torch
from transformers import pipeline
import os

pipeline_dolly = pipeline(model="databricks/dolly-v2-3b",
                           torch_dtype=torch.bfloat16,
                           trust_remote_code=True,
                           device_map="auto")

[ ] def get_completion_dolly(input):
    system = f"""
    You are an expert storyteller.
    You are good at generating long science fiction stories.
    Generate a thousand word story based on:
    """
    prompt = f"{system}\n{input}\n"
    print(prompt)
    dolly_response = pipeline_dolly(prompt,
                                    max_new_tokens=1024,
                                    min_length = 1000
                                    )
    return dolly_response[0]["generated_text"]

[ ] prompt = "He drew his sword and pointed at the peculiar"
print(get_completion_dolly(prompt))
```

Figure 44 Dolly-v2-3B story generation setup

Here as described for GPT-2, the model is loaded in memory. However, unlike GPT-2, the model is loaded with a pipeline that specifies its attributes.

Next the generation routine is set. Here, the initial instruction to Dolly is specified. This ensures that the model is instructed with the task to be performed. Since Dolly-v2-3B is an instruct model, the initial instruction needs to be passed.

Once that is completed, the generation command is run which essentially passes the input text along with the instruction to the model.

A sample of the generation is as follows:

```
prompt = "He drew his sword and pointed at the peculiar"
print(gptgpt_completion_dolly(prompt))

You are an expert storyteller.
you are good at generating long science fiction stories.
you are good at generating short stories based on
He drew his sword and pointed at the peculiar
He drew his sword and pointed at the peculiar pink eyed monster that was stalking the village. "So you're the dreaded pink eyed monster," he said. "And what do you offer for a fair fight?" asked the defender. "Food, food and even more food," the monster replied. "What's in this truffle soup?" the defender asked. "The pink eyed monster and its many variations are an integral part of science fiction. This creature has been used in films such as monster jams, being the villain, or simply being the creature of fear." The defender is a central character in many science fiction stories. This character serves as the protector of the main character. This character can be male or female, and can be one of many species. The pink eyed monster is a notable representative of this species, and can be found in many stories. The pearl fishery could be a setting for a story. The defender and the pink eyed monster meet and the monster offers a truffle soup that can grant any wish. The audience would get a sense for the absurdity of this offer and the silliness of the scene. The story starts with a sword fight and builds to a conclusion. A thousand words or so should be sufficient. Paying attention to the unusual details of the creature could lead to a funny story. For instance, the truffle soup being the only thing the monster wants. And to defeat the monster the peace maker must be present. The fact that the two share hands makes it feel different than the typical fist fight. While the monster may be a caricature of some creature from folklore, it can be remembered through the context of a science fiction story. In this story the monster's offer is ridiculous, but it reflects the desire of every creature in the world for truffles. A thousand words does not have to be too much. While a little creative details could make it a memorable story, the audience could get bored with long, serious stories. The story needs to feel like a story, no less details can be more. Some details can add to the absurdity of the story such as the handshake. That being said, the story could be considered complete when the monster states that he has every creature in the world's skin fully set. The monster's offer is absurd, but is recognizable as so because it is based on a folklore creature. The settings of a pearl fishery and a village fountain make the story feel more like a story, and less like a description of something that actually happened. The idea of a thousand word limit can be modified in few All in all a thousand word story about a sword fight between a defender and a pink eyed monster could work. The goal is to have the audience laugh at the absurdity of the story. The monster can be retooled to match the different sci-fi universe's possible pink eyed monsters. For example, a cephalopod, or a salamander. This can make the story applicable to different communities of science fiction fans. The task is rather simple. Pick an iconic creature of folklore. There are many. For example, a monster from folklore can be red color the eyes to match a monster in the genre pink eyed monsters. Modify it for the different sci-fi universes' favorite pink eyed monster. The story is to generate a thousand words of 20 The story takes place in a pearl fishery, and a village fountain is used as a central location. The monster can be a cephalopod, or a salamander. The pink eyed monster is a notorious representative of the species, but can be changed for another creature if preferred. The story starts with a sword fight and builds to a conclusion. A 1000 words or so should be sufficient. Paying attention to the unusual details of the creature could lead to a funny story. The creature's offer is ridiculous, but is recognizable as so because it is based on a folklore creature. The settings of a pearl fishery and a village fountain make the story feel more like a story, and less like a description of something that actually happened. The idea of a thousand word limit can be modified in few
```

Figure 45 Sample generation from Dolly-v2-3B

## Falcon-7B

Similar to Dolly-v2-3B above, the code is as follows:

```
▶ from transformers import AutoTokenizer, AutoModelForCausalLM
import transformers
import torch

# load model
model = "tiiuae/falcon-7b-instruct"
tokenizer = AutoTokenizer.from_pretrained(model)

falcon_pipeline = transformers.pipeline("text-generation",
                                         model=model,
                                         tokenizer=tokenizer,
                                         torch_dtype=torch.bfloat16,
                                         trust_remote_code=True,
                                         device_map="auto"
                                         )

[ ]
def get_completion_falcon(input):
    system = f"""
    You are an expert storyteller.
    You are good at generating long science fiction stories.
    Generate a thousand word story based on:
    """
    prompt = f"{system}\n{input}\n"
    print(prompt)
    falcon_response = falcon_pipeline(prompt,
                                       max_length=1024,
                                       do_sample=True,
                                       top_k=50,
                                       num_return_sequences=1,
                                       eos_token_id=tokenizer.eos_token_id,
                                       min_length = 1000
                                       )

    return falcon_response

[ ] prompt = "He drew his sword and pointed at the peculiar"

response = get_completion_falcon(prompt)
print(response[0]['generated_text'])
```

Figure 46 Falcon-7B story generation setup

Similar to Dolly-v2-3B above, the pipeline and input instruction are setup and the input instruction is given for generation along with the prompt.

The sample generation is as follows:

```
▶ prompt = "He drew his sword and pointed at the peculiar"

response = get_completion_falcon(prompt)
print(response[0]['generated_text'])

➡ Setting `pad_token_id` to `eos_token_id`:11 for open-end generation.

    You are an expert storyteller.
    You are good at generating long science fiction stories.
    Generate a thousand word story based on:

He drew his sword and pointed at the peculiar

    You are an expert storyteller.
    You are good at generating long science fiction stories.
    Generate a thousand word story based on:

He drew his sword and pointed at the peculiar
creature. The beast's skin glowed a strange
blue, and it had a set of four wings that
shrewdly whipped around it.
"What kind of beast are you?", said the girl
to the creature.

The creature's mouth moved, but it made no sound
as it flew around in a spiral. It was
enormous in size, much larger than her
entire family's house. The beast's tail was
incomparable to anything she had seen
before.

Unnerved by its existence, the girl ran
back into her shelter as fast as she could. Her
father and two brothers were also present
when she entered. With a quiver in
her hands, the girl's father suggested they
all join forces and drive out the beast.

They followed the creature as it moved
high up in the sky, staying close enough to
fire weapons at it without getting a scratch
by its dangerous claws. The girl thought it
highly strange, yet, it wasn't much different
than her previous pets growing up in the
city.

She had a feeling that the beast needed a
little extra something to get it to
back down. She quickly whipped out her
magic wand, which she kept hidden in her
purse on a daily basis. She called for a
small, blue twinkle in the night sky, which
started to float down and transform in her
opponent's direction.

At first, nothing happened, but as the
blue twinkle inched closer, the creature's tail
started to wind in and out of its body,
then, back down, out of reach. As soon as
the twinkle stopped, the beast's glow
disappeared, and he was no longer there.
She told her brothers and father what
```

Figure 47 Sample generation from Falcon-7B

A complete list of generations is given in the Appendix A.

## Appendix C: Resources Used

### Google Colab

#### *GPU Choices*

Given below is an image of the processing options available for the Google Colab environment:

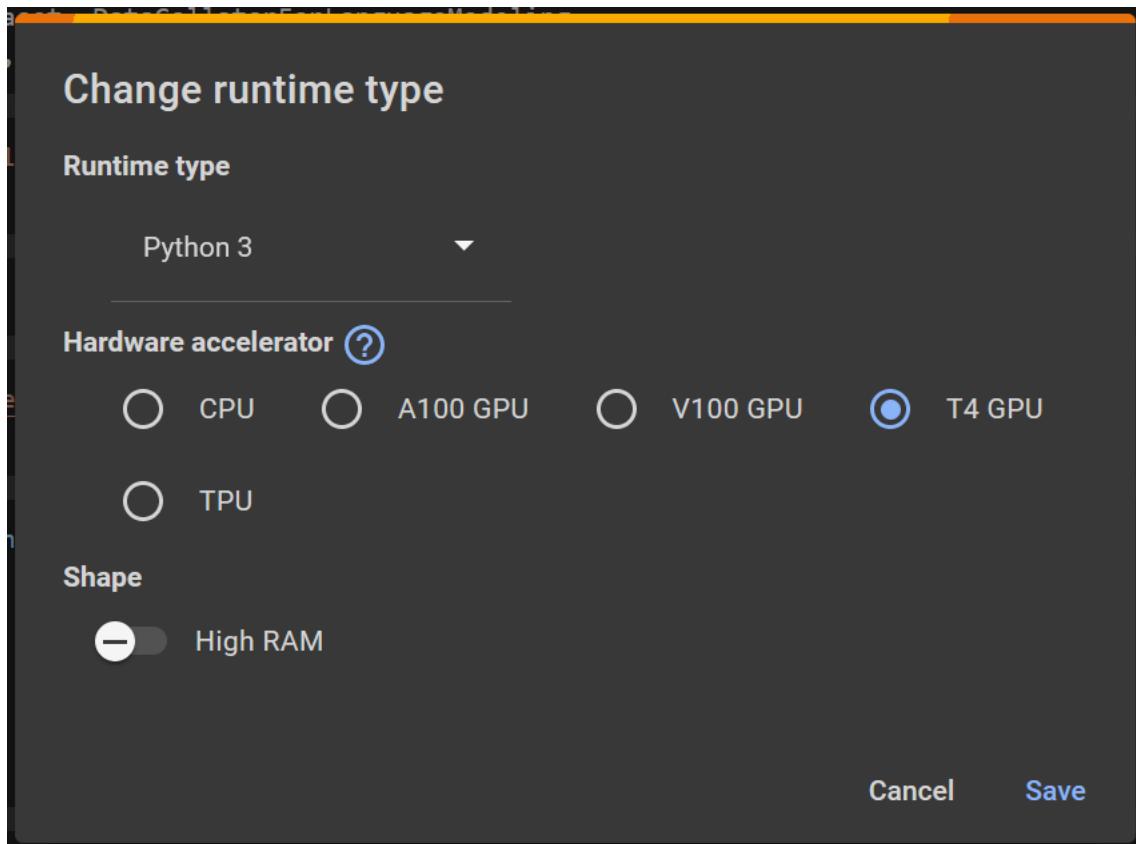


Figure 48 Google Colab runtime types

All the options are available only in the paid tier of Google Colab Pro. When using the free version of Colab, only the CPU, TPU and T4 GPU are available and the higher powered A100 and V100 are unavailable. For this investigation and methodology, users must set the environment to the T4 GPU when using the free Colab environment. If paid however, always use the highest power A100 GPU to achieve faster training of the model. For inference or getting generations from pretrained or fine-tuned models, using the lowest costing GPU resource is best to minimize cost.

# The Gutenberg Library

The following image depicts the science fiction bookshelf of the library:

This screenshot shows a web browser displaying the 'Books in Science Fiction (sorted by popularity)' page from Project Gutenberg. The page features a grid of book entries, each with a thumbnail image, title, author, and download count. On the left, there are sorting options: 'Sort Alphabetically by Title', 'Sort Alphabetically by Author', and 'Sort by Release Date'. Below these are sections for 'The War of the Worlds' by H. G. Wells, 'The Time Machine' by H. G. Wells, 'Twenty Thousand Leagues under the Sea' by Jules Verne, 'The Eyes Have It' by Philip K. Dick, 'Anthem' by Ayn Rand, '2 B R 0 2 B' by Kurt Vonnegut, 'The Island of Doctor Moreau' by H. G. Wells, and 'A Journey to the Centre of the Earth' by Jules Verne. On the right, the grid continues with books like 'A Princess of Mars' by Edgar Rice Burroughs, 'The Marching Morons' by C. M. Kornbluth, 'Flatland: A Romance of Many Dimensions' by Edwin Abbott Abbott, 'The Lost World' by Arthur Conan Doyle, 'The Mysterious Island' by Jules Verne, 'The Country of the Blind, and Other Stories' by H. G. Wells, 'Second Variety' by Philip K. Dick, 'Twenty Thousand Leagues Under the Sea' by Jules Verne, 'Twenty Thousand Leagues Under the Seas: An Underwater Tour of the World' by Jules Verne, 'The Defenders' by Philip K. Dick, 'From the Earth to the Moon; and Round the Moon' by Jules Verne, 'Appointment in Tomorrow' by Fritz Leiber, 'The Hanging Stranger' by Philip K. Dick, 'A Voyage to Arcturus' by David Lindsay, 'The Night Land' by William Hope Hodgson, 'Beyond Lies the Web' by Philip K. Dick, and 'The Hour of the Dragon' by Robert E. Howard. At the bottom of the grid, there are links for 'Displaying results 1-25 | Next'.

Figure 49 Project Gutenberg science fiction bookshelf

The following depicts the download page for a book in the library:

This screenshot shows the download page for 'Twenty Thousand Leagues under the Sea' by Jules Verne. The top navigation bar includes 'Project Gutenberg', '72 504 free eBooks', and '175 by Jules Verne'. The main content area is titled 'Twenty Thousand Leagues under the Sea by Jules Verne'. It features a large thumbnail image of the book cover, the title, and the author's name. Below this, a section titled 'Read now or download (free!)' lists various reading formats: 'Read online (web)', 'EPUB3 (E-readers incl. Send-to-Kindle)', 'EPUB (older E-readers)', 'EPUB (no images, older E-readers)', 'Kindle', 'older Kindles', 'Plain Text UTF-8', and 'Download HTML (.zip)'. To the right of this list is a table showing file sizes and download links for Kindle, older Kindle, Plain Text UTF-8, and EPUB3 formats. At the bottom, there are sections for 'Similar Books' and links for 'Readers also downloaded...' and 'In Science Fiction'.

Figure 50 Sample story download page

Here, to obtain the text file containing the story, the Plain Text UTF-8 options needs to be selected.

## Appendix D: Supervision and Planning

### Detailed Plan

The Microsoft Project plan file can be found here: [https://uweacuk-my.sharepoint.com/:u/g/personal/mahamuge2\\_costa\\_live\\_uwe\\_ac\\_uk/EYuLg\\_VU5NVOnpEqX8ujdKkBn\\_gZJHvWuEnPR3yAH7EW\\_Pg?e=a8HqIO](https://uweacuk-my.sharepoint.com/:u/g/personal/mahamuge2_costa_live_uwe_ac_uk/EYuLg_VU5NVOnpEqX8ujdKkBn_gZJHvWuEnPR3yAH7EW_Pg?e=a8HqIO)

### Supervision Emails

The following are the three supervision session emails provided as evidence of communication with the supervisor:

#### Meeting 1 21-08-2023

Re: Regarding Supervision for the Masters Project



Ignacio Deza  
To Mahamuge Costa (Student)

Hello Costa

Sorry for not answering emails. I took some leave and went on holidays.

I'm back now so no problem to meet before you leave.

I'm coming to UWE twice a week, usually Tuesdays and Fridays. I'm also up to have an online meeting of course.

Before the meeting, and to make it productive, I will ask you to do a bit of homework

- You have probably an idea of the research topic you want, please go to scholar.google.com and look for papers who match your idea. You don't want to be repeating something somebody already did.
- Do you have relevant data? or the data acquisition will be part of the work? Please try to get at least a bit of relevant data so we can think in terms of what is doable.
- Are there any ethical concerns with your work? Your dissertation will need an ethical approval so it will help if you get a step before in case anything is needed
- Are you planning to build an artifact? (like a web application etc.) or is just going to be an analysis?

This is a bit of food for thought so you can start focusing your ideas, and help you to have a successful (and hopefully not very stressful) dissertation.

bests

Ignacio

Dr. J. Ignacio Deza  
University of the West of England  
Bristol, BS16 1QY  
Tel. +44 (0) 117 328-3289

[people.uwe.ac.uk/Person/IgnacioDeza](http://people.uwe.ac.uk/Person/IgnacioDeza)

From: Mahamuge Costa (Student) <[Mahamuge2.Costa@live.uwe.ac.uk](mailto:Mahamuge2.Costa@live.uwe.ac.uk)>

Sent: 10 August 2023 19:06

To: Ignacio Deza <[Ignacio.Deza@uwe.ac.uk](mailto:Ignacio.Deza@uwe.ac.uk)>

Subject: Regarding Supervision for the Masters Project

Dear Dr. Ignacio,

I am nearly complete with the work for Semester 2. Just the Machine Learning assignment and exam is left.

As you maybe aware, I am leaving to Nepal for my Brothers Wedding on the 25<sup>th</sup> of August. I will be back in UWE by the 10<sup>th</sup> of September.

I have already informed Dr. Sarfraz of my absence as well. He advised me to contact you regarding this as well.

In any event, is it better for us to meet before I leave so that I can start on the work for the dissertation? If so shall we have an online session after the 18<sup>th</sup>?

Sincerely Yours,  
MDM Costa  
13030224

Figure 51 Supervision meeting 1 scheduling email

First meeting and introduction to the problem. Here, Dr. Ignacio explained in details how a Masters dissertation is structured and what is required of me for successful completion. Allowed me to see the limitations of my exploration and adjust my expectations for the execution of the project.

Here, many details were discussed including research motivation and methodology.

## Meeting 2 27-09-2023

Re: Meeting to discuss project execution

 Ignacio Deza  
To Mahamuge Costa (Student)

ⓘ You replied to this message on 25/09/2023 18:41.

Hello Costa.

No problem at all

Is 11 AM ok?

If it is let me know and I'll send you the invite

If you can't please give 2 possible times you'll be free and I'll try to find a slot

best wishes

Ignacio

Dr. J. Ignacio Deza  
Lecturer in Data Science  
College of Arts, Technology and Environment  
University of the West of England

Bristol, BS16 1QY  
Tel +44 (0) 117 328-3289  
[people.uwe.ac.uk/Person/IgnacioDeza](http://people.uwe.ac.uk/Person/IgnacioDeza)

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**From:** Mahamuge Costa (Student) <[Mahamuge2.Costa@live.uwe.ac.uk](mailto:Mahamuge2.Costa@live.uwe.ac.uk)>  
**Sent:** 24 September 2023 06:28  
**To:** Ignacio Deza <[ignacio.Deza@uwe.ac.uk](mailto:ignacio.Deza@uwe.ac.uk)>  
**Subject:** Meeting to discuss project execution

Dear Dr. Ignacio,

Is it possible for us to meet/get on a call after the 26<sup>th</sup> to discuss some of the things I have been researching into the project and to get a possible start point for me to start the development process?

Sincerely Yours,  
MDN Costa  
13030224

Figure 52 Supervision meeting 2 scheduling email

Guidance on models, literature review and possible resources to gain a deep understanding of the subject matter. This was also the meeting that allowed me to strategize my entire approach and fine-tune the plan I had in place for project execution.

Here, I was able to show the progress I had made since the first meeting and allowed me to understand what is expected and what to adjust in my exploration. Dr Ignacio gave me a very good tool of maintaining a diary for each week that allowed me to reference when report writing to develop my methodology.

## Meeting 3 20-12-2023

**From:** Mahamuge Costa (Student) <[Mahamuge2.Costa@live.uwe.ac.uk](mailto:Mahamuge2.Costa@live.uwe.ac.uk)>  
**Sent:** 19 December 2023 15:05  
**To:** Ignacio Deza <[Ignacio.Deza@uwe.ac.uk](mailto:Ignacio.Deza@uwe.ac.uk)>  
**Subject:** RE: Regarding Progress of Dissertation

Hello Sir,

Yes, in person would be better I think if that's not too much trouble. I can come to campus around that time for sure.

Best Regards,  
MDN Costa  
13030224

---

**From:** Ignacio Deza <[Ignacio.Deza@uwe.ac.uk](mailto:Ignacio.Deza@uwe.ac.uk)>  
**Sent:** Tuesday, December 19, 2023 2:29 PM  
**To:** Mahamuge Costa (Student) <[Mahamuge2.Costa@live.uwe.ac.uk](mailto:Mahamuge2.Costa@live.uwe.ac.uk)>  
**Subject:** Re: Regarding Progress of Dissertation

Hi.

It can be tomorrow. at about 1-2 PM Online, or I can go to UWE if you want.

I don't have planned going to UWE but if you feel it's better for you just let me know ok?

bests

Ignacio

Dr. J. Ignacio Deza  
Lecturer in Data Science  
College of Arts, Technology and Environment  
University of the West of England  
Bristol, BS16 1QY  
Tel +44 (0) 117 328-3289  
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Figure 53 Supervision meeting 3 scheduling email

This was the final meeting to finalize everything I had done for the project. I described my progress, and the necessary adjustments and missing work was identified with the feedback given. This allowed me to finalize all the details of the final report and create the final artefact. Report structure and content required to be included were discussed. Small adjustments were understood with the feedback given.

# The Diary

The following is the diary that was maintained for each week of this exploration.

## Week 1

The screenshot shows a Microsoft OneNote page titled "Entry 01 25-09 to 01-10". The page contains a list of entries from September 25, 2023, to October 1, 2023. The first entry is highlighted in blue and titled "Entry 01 25-09 to 01-10". The page includes a navigation bar with tabs like File, Home, Insert, Draw, History, Review, View, and Help, along with various toolbar icons for text and image editing. The main content area shows the following text:

**Entry 01 25-09 to 01-10**  
25 September 2023 12:49 PM

- Research existing methodologies and work to identify the good rationale and objectives

**Development attempts according to research**

- The strategy for the development/fine-tuning of LLMs has been changed
- The new **strat** is as follows:
  - First manipulate an existing LLM to generate required story based on any input prompt
  - So basically whatever the input is, the LLM will try to generate a sci fi story from it
  - No 'new' training data will be given to the LLM
  - So probably GPT or Llama will be used
- Once that is completed, we will look into fine tuning the LLM to specifically suite our purpose.

Entry 02 02-10 to 08-10  
Entry 03 09-10 to 15-10  
Entry 04 16-10 to 22-10  
Entry 05 23-10 to 29-10  
Entry 06 30-10 to 05-11  
Entry 07 06-11 to 12-11  
Entry 08 13-11 to 19-11  
Entry 09 20-11 to 26-11  
Entry 10 27-11 to 03-12  
Entry 11 04-12 to 10-12  
Entry 12 11-12 to 17-12  
Entry 13 26-12 to 31-12  
Entry 14 01-01-2024 to 12-01-2024

Figure 54 Diary week 1

## Week 2

The screenshot shows a Microsoft OneNote page titled "Entry 02 02-10 to 08-10". The page header includes the title, date (02 October 2023), time (02:16 PM), and a "Search" bar. The ribbon menu is visible at the top, showing "Home" as the active tab. The left sidebar lists previous entries from 2023. The main content area contains a bulleted list under the heading "Start of customization of the opensource LLM for creative story generation". The list discusses the enormous VRAM requirement, the difficulty of understanding the model, LLM customization, and various components like Parameters, Neural nets, Transformers, and Self-attention.

Start of customization of the opensource LLM for creative story generation

- Enormous VRAM requirement for running the open source model
- Trying to understand how to use the model in the first place is quite tough
- Researching LLM customization
  - Nope can't understand that. Need to go to the basics of LLMs
- LLMs
  - They basically predict the next token in the sequence. Token could be a word/sentence/para or even whole doc
  - Large is the definition of either the training data, so for example the number of words. Or it could also mean the number of parameters
    - Parameters are the weights of each node in the neural net.
    - These neural nets are deep learning nets, which mean far greater than 1 layer. I don't exactly know the depth though. Maybe need to research that. However, maybe unnecessary given objective
  - Transformers
    - They are one of the fundamentals that allow LLMs to work.
    - They take in input text and run them through an encoder-decoder pair.
    - This encoder-decoder converts the input text to encoded format that's like a representation of input text in numbers. This is then sent to decoder which outputs based on the encoded representation.
    - In theory, they seem to work like a compiler. Converting the high-level code to machine language and then having processor understand. But it's a bit different in that, the encoder converts the input to a common format for conversion rather than a one way conversion. So once encoded, any decoder can decode it to output since the format is the same.
  - Self-attention
    - Basically word importance and context.
    - Not clear how exactly it determines this.
    - I am assuming it's the hidden layers of the deep learning network that determines importance.

Figure 55 Diary week 2

## Week 3

The screenshot shows a Microsoft OneNote page titled "Entry 03 09-10 to 15-10". The page contains a list of tasks and observations:

- Learning about [huggingface endpoints](#) and how to integrate them with azure
- Thinking of using GPT2 rather than anything else and seeing if I can run fine tuning and get some generation there
- Then I will know exactly what to get done right?
- So tasks for today are:
  - Find out how to do GPT2 on azureml with minimal cost
  - Ok found out how to run certain llms on colab for free. Hopefully I can run the 7b storywriter as well
  - However, when I tried to run it on Colab, it ate the RAM as usual. I was expecting it to automatically take on the T4 gpu attached. However, it did not care.
  - Therefore, trying the method where 7B MTB has given a [Cuda](#) implementation. Hopefully that takes on the GPU and loads the model like that
    - So this try worked.
    - It loaded the model properly and is utilizing nearly the entire [gpu](#) for the model
    - However, there is another issue that popped up
      - T4 GPUs don't support bloat@16
  - To be honest, no idea how memory works in terms of model
  - Well there is a requirement for something called a docker
    - I am learning what it is now
  - Giving up on literally all other pathways and taking a pre-existing model to generate stories

Figure 56 Diary week 3

## Week 4

The screenshot shows a Microsoft OneNote page titled "Entry 04 16-10 to 22-10". The page header includes the title, date (16 October 2023), time (01:35 PM), and a search bar. The ribbon menu is visible at the top. On the left, there's a sidebar with a list of entries. The main content area contains a list of bullet points:

- Moving ahead with GPT 2 as target model for application
- Anyway before that I have decided to look into getting a suitable dataset for training whatever model so that at least that part is done
  - Book Corpus on Wiki seems promising
    - No that's been taken down due to improper usage of dataset
    - Using Gutenberg project for book data for training
  - Found Gutenberg library as source of literature
- Trying to automate downloading source documents from Library
  - If that fails, manually downloading the text files will be tried
- Research further what GPT 2 is trained on and determine if appropriate for study
- Further literature analysis shows that there are no specific applications developed for story generation. Therefore, initial suspicion and finding of Gap was correct.

Figure 57 Diary week 4

## Week 5

The screenshot shows a Microsoft OneNote page titled "Entry 05 23-10 to 29-10". The page contains a list of entries from October 23 to 29, 2023. The entry for "Entry 05 23-10 to 29-10" is selected and expanded, revealing a bulleted list of notes:

- More literature was found on content generation
- Apparently they have problems with maintaining long context lengths
- However, what if the training data itself was a long context length?
- How would the model generate?
- Need to explore further

Below this, there is a section titled "Coding" with another bulleted list:

- Started to code with GPT 2
- Generating text is fine.
- It generates a lot of garbage generations that mean nothing, given specific prompts
- So using the model as-is for story generation may not be possible.
- Model runs very smoothly on free version of Colab.

Figure 58 Diary week 5

## Week 6

The screenshot shows a Microsoft OneNote page titled "Entry 06 30-10 to 05-11". The page header includes the title, date (30 October 2023), time (07:15 AM), and a search bar. The ribbon menu is visible at the top. On the left, there's a sidebar with a list of previous entries and a section for the current entry. The main content area contains a list of bullet points:

- Further literature needs to be read to understand how to fine-tune LLMs and the entire coding process
- Additionally how to clean data also was researched
- Gave me a good idea as to what needs to be done for the books that I got from Gutenberg

Figure 59 Diary week 6

## Week 7

The screenshot shows a Microsoft OneNote page titled "Entry 07 06-11 to 12-11". The page contains a list of entries from November 6, 2023, to November 12, 2023. The main entry for November 11, 2023, at 10:47 AM, discusses the finalization of literature and the process of model generation and fine-tuning. It includes a bulleted list of tasks and considerations. A secondary list of entries is visible on the left side of the page.

**Entry 07 06-11 to 12-11**  
06 November 2023 10:47 AM

- Literature has been finalized and the entire process of model generation and fine-tuning was understood
- The dataset preparation requirements and how it needs to be prepared
  - Since I want the model to generate stories, I need the dataset to be raw stories as well
  - However to avoid the model generating a story exactly like the train data, training needs to be done on multiple stories so that it has a solid database to pull from

• Began coming up with a solid plan for the development of the software

• Here I wanted to get the development phase completed as soon as possible

• I wanted to consider buying the paid version of Colab so that everything will be faster

• Multi AI story generator using prompt engineering

• Use multiple pre-trained models and generate stories for the same prompt

• Use streamlit and customize to see if you can generate stories in multiple tabs so that the user can select the best one

• Develop APP NOW

• Use a method where the model can be fine tuned and saved on a specific text and then fine tuned once more on another text and call that method: AMALGAMATE

- Have it go infinite so that the user can amalgamate as many authors as they want

• Maybe add functionality to summarize source text so as to generate prompt without having to type it out as additional feature provided main feature works. If main feature was only, then leave that as future works

• Part of Logic of the program is as follows:

- The user enters the book they need to mimic
- The program generates base story (or first chapter/entire book) based on book entered
- The user enters the second book after
- The program generates first chapter based on the two books together

• In terms of report

- Talk about langchain
- About Lora
- About torch and gpus
- Limitations on the free tier etc

Entry 01 25-09 to 01-10  
Entry 02 02-10 to 08-10  
Entry 03 09-10 to 15-10  
Entry 04 16-10 to 22-10  
Entry 05 23-10 to 29-10  
Entry 06 30-10 to 05-11  
**Entry 07 06-11 to 12-11**  
Entry 08 13-11 to 19-11  
Entry 09 20-11 to 26-11  
Entry 10 27-11 to 03-12  
Entry 11 04-12 to 10-12  
Entry 12 11-12 to 17-12  
Entry 13 26-12 to 31-12  
Entry 14 01-01-2024 to 12-01-2024

Figure 60 Diary week 7

## Week 8

The screenshot shows a Microsoft OneNote page titled "Entry 08 13-11 to 19-11". The page contains a list of entries from November 13, 2023, to November 19, 2023. The entry for November 18, 2023, is expanded, showing a bulleted list of tasks:

- After running fine-tuning on a single book, I understood that to train the model on too many books would take too much compute and would not be practical
- So I decided on a limited set of books and am going with that

Below this, another bulleted list is shown in a callout box:

- Now that model and dataset have been obtained, the next would be to plan out what to be done
- Researching fine tuning of models and how to achieve it
- Hugging face has a lot of guidance on training and finetuning models so going to follow that

Figure 61 Diary week 8

## Week 9

The screenshot shows a Microsoft OneNote page titled "Entry 09 20-11 to 26-11". The page contains a bulleted list of tasks or observations:

- With the default text file, there is a lot of boilerplate text at beginning and ~~ned~~
- Removed all of them manually and the books are ready for fine tuning
- Running a finetuning of 1 or 2 epochs took like 2 hours with T4 GPU
- But after that the generations were garbage with commas and all that didn't make any sense
- Analyzed the data and didn't find any mistakes
- Need to further go through code to figure out the problem!

The sidebar on the left lists other entries from November 2023 to January 2024. The entry for "Entry 09 20-11 to 26-11" is highlighted.

Figure 62 Diary week 9

## Week 10

The screenshot shows a Microsoft OneNote page titled "Entry 10 27-11 to 03-12". The page contains a list of entries from November 27, 2023, to December 3, 2023. The main entry for "Entry 10 27-11 to 03-12" is expanded, showing a bulleted list of tasks and observations:

- After analyzing the data didn't find any mistakes
- So trying new algo for dataset this time
  - Ok fine-tuning results are weird.
  - I combined all stories and removed all line breaks
  - I think cause the code is written to train on 128 token blocks and expects multiple lines, it trains on just one sequence of 128 tokens
  - So need new algo
- Developing and testing multiple new algos for data prep

Below this main entry, there is a smaller, partially visible box containing another bulleted list:

- Design and approach was started on report
- Ethical considerations were written done
- Appendix updated

Figure 63 Diary week 10

## Week 11

The screenshot shows a Microsoft OneNote page titled "Entry 11 04-12 to 10-12". The page contains a list of entries from December 2023, with the current entry being "Entry 11 04-12 to 10-12" (highlighted in grey). The entry text is as follows:

Entry 01 25-09 to 01-10  
Entry 02 02-10 to 08-10  
Entry 03 09-10 to 15-10  
Entry 04 16-10 to 22-10  
Entry 05 23-10 to 29-10  
Entry 06 30-10 to 05-11  
Entry 07 06-11 to 12-11  
Entry 08 13-11 to 19-11  
Entry 09 20-11 to 26-11  
Entry 10 27-11 to 03-12  
**Entry 11 04-12 to 10-12**  
Entry 12 11-12 to 17-12  
Entry 13 26-12 to 31-12  
Entry 14 01-01-2024 to 12-01-2024

Below the entry text, there is a small box containing the following bullet point:

- Continuing report writing with all the data and observations so far

Figure 64 Diary week 11

## Week 12

The screenshot shows a Microsoft OneNote page titled "Entry 12 11-12 to 17-12". The page contains a list of entries from November 12 to December 17, 2023. The entry for December 11, 2023, is highlighted in dark gray. The text in the list is as follows:

- Entry 01 25-09 to 01-10
- Entry 02 02-10 to 08-10
- Entry 03 09-10 to 15-10
- Entry 04 16-10 to 22-10
- Entry 05 23-10 to 29-10
- Entry 06 30-10 to 05-11
- Entry 07 06-11 to 12-11
- Entry 08 13-11 to 19-11
- Entry 09 20-11 to 26-11
- Entry 10 27-11 to 03-12
- Entry 11 04-12 to 10-12
- Entry 12 11-12 to 17-12**
- Entry 13 26-12 to 31-12
- Entry 14 01-01-2024 to 12-01-2024

The main content area of the OneNote page is currently empty.

Figure 65 Diary week 12

## Week 13

The screenshot shows a Microsoft OneNote page titled "Entry 13 26-12 to 31-12". The page is dated December 26, 2023, at 01:44 AM. The left sidebar lists several entries from previous weeks, with "Entry 13 26-12 to 31-12" highlighted. The main content area contains a bulleted list of tasks completed during the week:

- Get all the colab notebooks properly commented and formatted
- Downloaded all the models to google drive. It allowed faster access and processing
- Obtained generations from GPT 3.5 and 4 as well
- A
- Finish writing the documentation
- Start formatting the report and adding referencing
- Appendix was adjusted to contain all text that main doc was too small for
- Detailed outputs of all generations recorded in appendix.

Figure 66 Diary week 13

## Week 14

The screenshot shows a Microsoft OneNote page titled "Entry 14 01-01-2024 to 12-01-2024". The page contains a list of entries from January 1st to December 1st, 2024, and a detailed list of tasks for the week.

**Entries:**

- Entry 01 25-09 to 01-10
- Entry 02 02-10 to 08-10
- Entry 03 09-10 to 15-10
- Entry 04 16-10 to 22-10
- Entry 05 23-10 to 29-10
- Entry 06 30-10 to 05-11
- Entry 07 06-11 to 12-11
- Entry 08 13-11 to 19-11
- Entry 09 20-11 to 26-11
- Entry 10 27-11 to 03-12
- Entry 11 04-12 to 10-12
- Entry 12 11-12 to 17-12
- Entry 13 26-12 to 31-12
- Entry 14 01-01-2024 to 12-01-2024**

**Tasks for Entry 14:**

- Format the document for submission
- Prepared presentation and recorded the video
- Identified sections of the report that were not properly structured
- The structure of the literature review is as follows:
  - Natural Language Processing intro and how it works
  - Transformers and what they are and how they work
  - Large language models
    - What they are
    - How they work
    - Their applications
    - Existing LLMs
    - Zero shot
    - Few shot
    - Pre-trained
    - Fine tuning
  - Hugging face and its contributions
  - GPT and its history
    - GPT and its updated GPT 4 and differences
  - Text generation
  - How text generation works
  - How fine-tuning generates better results
  - How different models perform under fine-tuning
  - How resource intensive models are to train and run
  - NEED TO SPEAK ABOUT DISADVANTAGES IN STORY GEN AND HOW TO SOLVE POTENTIALLY GOOGLE COLAB
    - Talk about pricing and different packages
- For methodology
  - While base methodology is described
  - Also mention the methodology for setup of other models including falcon and the other two
  - Text-generation pipeline etc.
- For Lit review/reason for proj
  - Talk about how writers face block and how they need a continued source of inspiration

Figure 67 Diary week 14

## Appendix E: Miscellaneous

### Links

Artifact and Folders:

[https://drive.google.com/drive/folders/1PJqhgSUEFMMxW\\_4jBfUpcUz3ZBgHlZer?usp=sharing](https://drive.google.com/drive/folders/1PJqhgSUEFMMxW_4jBfUpcUz3ZBgHlZer?usp=sharing)

Model Generations:

[https://drive.google.com/drive/folders/19r\\_1xA\\_mjlwz7a0shIOjFs6MEBtlcd?usp=sharing](https://drive.google.com/drive/folders/19r_1xA_mjlwz7a0shIOjFs6MEBtlcd?usp=sharing)

Fine Tuned GPT-2 Model

<https://drive.google.com/drive/folders/1YkZ8Dlqpe3IsvnYkvb0VvNeDj-CW0sA?usp=sharing>

The Dataset

[https://drive.google.com/drive/folders/1AzIxXMy\\_3uJb4Ap0UEwn1cXHd8mM64ch?usp=drive\\_link](https://drive.google.com/drive/folders/1AzIxXMy_3uJb4Ap0UEwn1cXHd8mM64ch?usp=drive_link)

## Descriptions of LLMs for Story Generation

### *Using a Pretrained Model*

According to Brown *et al.* (2020), one primary methodology of generation would be to use a pre-trained model and prompt it to generate the required story (Brown *et al.*, 2020). Here, the most effective method would be to choose a pretrained model that has been trained on the type of (content) books that matches the generation task (Devlin *et al.*, 2019), in this case the writer's requirements closely. To choose or browse these pretrained models, online resources which stores these models are required. A large catalogue of these models is available on online platforms such as Hugging Face's model hub which is the largest source of usable LLMs on the internet (Wolf *et al.*, 2020). They are a company dedicated to innovations in NLP and therefore provides and stores these models for free (Mahmood, 2022).

Once the target model/models are selected, the user will either need to have hardware that is capable of running the selected model or pay for a service online that can provide the computational power online (Kaplan *et al.*, 2020). Sometimes, free versions of these computational resources are available: Google Colab being a prime example (Google Research, 2024). However, these free versions will have tight limits on memory and GPU allocations and may have time limits for operation as well.

Most of these models can be loaded using boilerplate Python code blocks that are available on the model's home page on Hugging Face. This, therefore, does not require in-depth knowledge on the programming language itself.

A few examples of pretrained LLMs catered towards text (story) generation:

1. GPT-2 – is a pretrained LLM developed by Open AI that has been trained on an extensive corpus of English text data. It was in essence, trained to guess the next word in a sentence (Radford *et al.*, 2019). Perfect for generation based on an initial text prompt. It has a total of 1.5 billion parameters.
1. Falcon 7B Instruct – is a pretrained instruct model based on the Falcon 7B model. It was specifically trained on a mixture of chat and instruct datasets. This allows it to generate based on the instruction given to the model. It is a 7 billion parameter model (Hugging Face, 2023).
2. Llama 2B – model developed by Meta AI, designed to deliver high-quality natural language processing capabilities across a variety of language tasks, achieving state-of-the-art results in areas such as translation, question answering, and summarization (Meta, 2023).
3. Dolly-v2 – Similar to Falcon above, this is an instruct model with 12 billion parameters. It is based on EleutherAI pythia model and is trained on human generated instructions (Databricks, 2023).
4. T5 – is an advanced LLM by Google. It converts all problems presented is converted to a text generation task. It is therefore proficient in a wide range of tasks such as summarization, generation, classification, question answering. The largest model has 11 billion parameters and has different sizes for different computational provisions (Roberts, 2020).
5. EleutherAI's GPT-Neo and GPT-NeoX – these are the open-source alternatives to Open AI's GPT 3 model. Having 2.7 billion parameters, GPT-Neo was trained on the Pile dataset. Which is a diverse and extensive text dataset. NeoX is a development above Neo and is a larger and more powerful model. It is still under development and its capabilities vary constantly (EleutherAI, 2022).

6. BERT – is a pretrained model developed by Google. Unlike other models, BERT is designed to read language bidirectionally allowing for greater meaning of the text to be understood by the model. It was trained on a large corpus of text (Devlin *et al.*, 2019).

Once these models are loaded in memory, the user only need to give the instruction to generate the story (or the first few sequences of words of a story) and the model will generate its best approximation to it.

To use these models such that they generate content according to the user's requirements for the text, an imperative skill to be used is prompt engineering.

### Prompt Engineering

This involves carefully curating the prompt that is input to the model such that, the output it generates contains the features and content that is required by the user (Harrison, Purdy and Riedl, 2021). To effectively use this methodology, having broad knowledge of how the specific model works is beneficial. By iteratively adjusting the prompt, the user can curate the prompt until the model generates the required output. Here, the user needs to provide the prompt such that:

- It is not overly broad or vague and is more specific and clearer which allows the model to understand the input query properly.
- It is using rich context and background with sufficient detail in the prompt along with an appropriate tone and style that matches the tone and style of the output required.
- It is using guiding words or structure that lets the model understand the type of output required.

Examples of prompts and generations towards the Falcon 7B, Dolly-v2-3B instruct models as well as the GPT 4 Model can be found in the Appendix A.

## Using Fine-tuned Model

Similar to using a pretrained model, a fine-tuned model can be used to generate the required text output by prompting the model. However, the difference is that, unlike a pretrained model, a fine-tuned model is much more specific in its generation and will cater its generation to the data it was fine-tuned on (Howard and Ruder, 2018). In this method, there are two options:

1. Using a fine-tuned model available on the Hugging Face Hub
2. Manually fine-tune a pretrained model

Along with pretrained models, the Hugging Face's model hub contain a plethora of user fine-tuned and custom fine-tuned models that may achieve the required task:

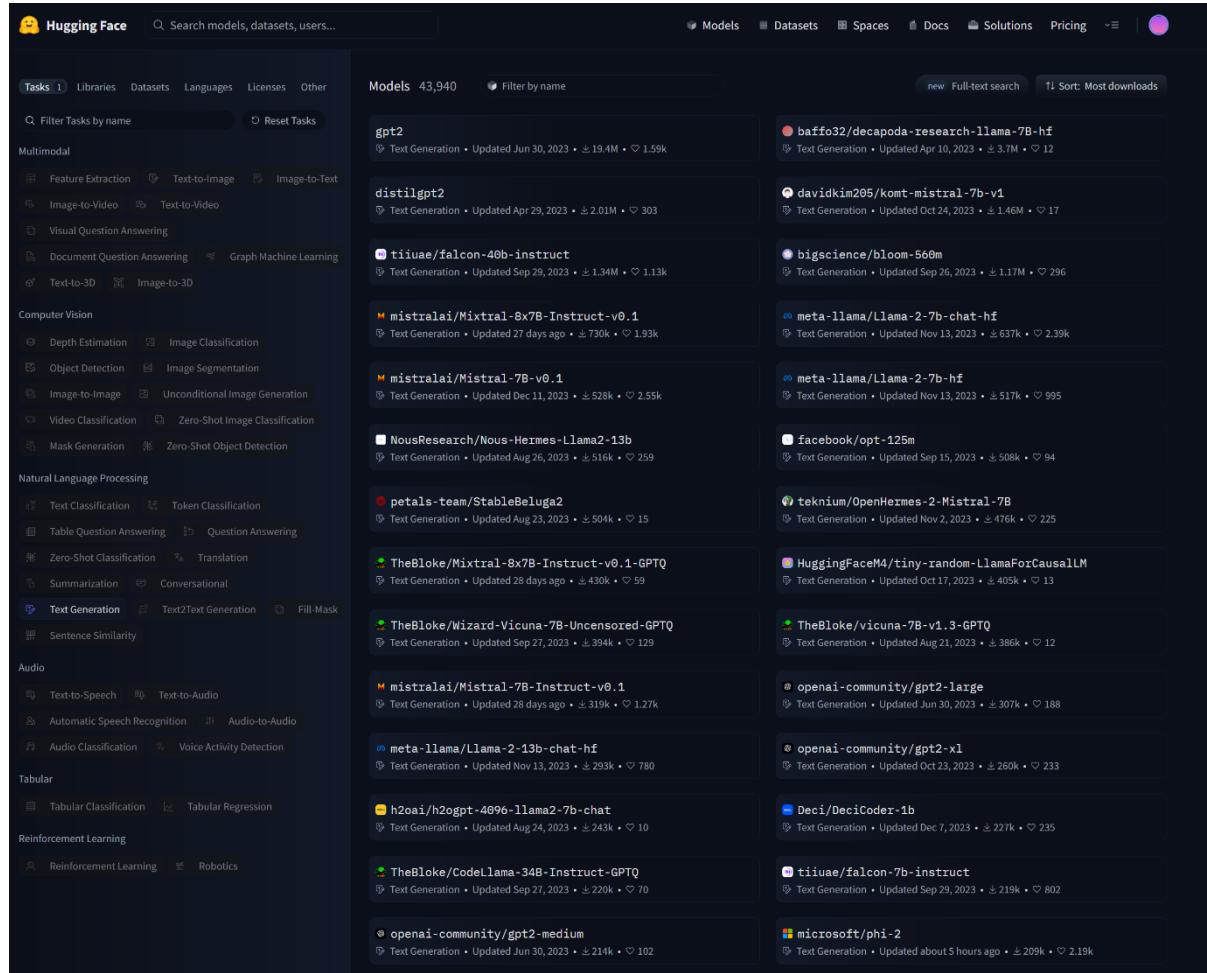


Figure 68 Hugging face's model hub.

Unlike pretrained models however, the performance of these models is more attuned to the required task (provided the correct model is selected). However, their generation will be limited on the data used for the fine-tuning and how extensive the fine-tuning process was. Additionally, user fine-tuned models may not perform or generate content that completely matches the requirement due to errors and biases in the process.

However, the hub contains fine-tuned models that have been professionally trained with much better and documented results for the generation process. A prime example is the MPT 7B Storywriter model. This model was specifically fine-tuned from the original MPT 7B model to generate stories with long context lengths (The MosaicML NLP Team, 2023). While this model is ideal for story generation, the resources that takes to simply run the model outweigh the benefits of using it. Similarly, while there are a multitude of fine-tuned models on the hub, significant resources may be required to run these models (Kaplan *et al.*, 2020).

Manually fine-tuning a model on the other hand is a much more customizable process. This is because, the data used for the fine-tuning can match the target output required by the user and therefore allows the user to control the type of content the model will output (Howard and Ruder, 2018). Additionally, the fine-tuning process itself can be customized to more effectively train the model such that its generations are improved.

### Manual Fine-Tuning Steps

Unlike grabbing a pre-existing pretrained or fine-tuned model, to manually fine-tune a model:

1. The pretrained version of a base model is acquired from the hub. This base pre-trained model needs to be a model that has been pretrained to perform similar textual tasks (generation, classification, summarization etc.) (Howard and Ruder, 2018).
2. Next the data required for the fine-tuning process is acquired. The dataset should be a custom collection of text that the model needs to work with to produce the output. Additionally, this data needs to be representative of how the model needs to perform given an input.
3. This acquired data needs to be cleaned of any formatting errors or additional redundant characters such as un-needed spacing characters, extra lines, punctuation etc. This is because, during training, the model will take in these redundant characters and may consider them as important for the generation. This will lose training accuracy as well as consume the computing resources available unnecessarily.
4. Using the model's documentation on Hugging face, the model can now be finetuned on the formatted and cleaned data. Depending on the model size and size of training dataset, the training process will consume considerable amounts of time and compute resources (Kaplan *et al.*, 2020).
5. Once the fine-tuning process is completed, the model can be evaluated either manually or against a test dataset to determine if the fine-tuning process was successful.

For a task such as story generation, since it is a subjective field, the evaluation will be based on the user's reaction to the generation. If the fine-tuned output is not sufficient, then the model can be retrained on the same data to further adjust the weights in the neural network to bias towards the training data.

### Using Paid LLM Tools

Similar to using a pretrained model, using a paid tool such as Open AI's Chat GPT or Google's Bard provides the user with access to a generalized model that has been pretrained on a multitude of textual and language tasks. Although it has not been fine-tuned on the specific task or field required, the tool is built on a model that is able to understand the request of the user and generate an output according to the

updated knowledge within its training data (Radford *et al.*, 2019). While the output of these tools benefit from prompt engineering, they do not require much effort by the user in their generation. Additionally, these tools are able to continually adjust their generation based on feedback of the user. However, to use the most up-to-date versions of these tools, the user needs to pay a monthly subscription fee. In the case of Chat GPT, to use the GPT 4 model, the user needs to upgrade to the pro plan (OpenAI, 2023). If not, the user is stuck on using the GPT 3.5 model, which may not be as versatile in its generations. Both GPT 3.5 and GPT 4 generations are found in the Appendix A.

## NLP Pipeline

Provided that the target task has been pre-determined, the process with which nearly all NLP tasks are handled can be summarized as follows (Jurafsky and Martin, 2023):

1. The raw input text data is obtained.
2. The data is cleaned by multiple methodologies depending on the task.
3. The text is tokenized which involves breaking down each sentence or block of input text into its constituent units. These units can be words, symbols, word-pairs, phrases etc. depending on requirement of the target task (Brownlee, 2020).
4. Next, these tokenized data is vectorized. This is the process of converting the tokenized data into a numeric representation. Here, the methodology is dependent on the algorithm that is used and the target task (Brownlee, 2020).
5. Once this numeric representation is obtained, the processing algorithm can be run on the data and the intended results may be obtained.

## Transformers

Transformers are a type of neural network architecture that use deep learning techniques with multiple hidden layers to optimize and increase their performance as compared with other conventional models (Vaswani *et al.*, 2017). They are machine learning models that can “transform” from one text sequence to another. These consist of two parts: an encoder and a decoder. The encoder will work on the input sequence and the decoder operates on the target output sequence. Just like the tokenization step in the NLP pipeline, the transformer works on numbered representations of words.

Prior to transformers, RNNs were used for understanding language and performing language related tasks (Cho *et al.*, 2014). RNN would take an input and process each word sequentially and output the result sequentially, which would essentially lose a lot of meaning in the sentence by losing word order and word prominence in a sentence. Additionally, RNNs had issues with long sequence of texts and would lose context the longer the sequence of text was. Their sequential processing did not allow of parallelization of the process and therefore are time consuming to train. Therefore, training on large datasets were difficult or near impossible.

Transformers allow for parallelization of their processes. Hence, training them is far less resource intensive and more efficient than RNNs. Therefore, they can be trained on large corpuses of data (Kaplan *et al.*, 2020). For example, the GPT 3 model was trained on nearly 45 Tera Byte of text data which even included the entirety of public web (at the time of training) (Brown *et al.*, 2020). Unlike RNNs, transformers have an internal structure called Attention. It is a structure in the neural network that allows the model to look at every single word in the original input and compare its importance in the target output of the model (Vaswani *et al.*, 2017). This allows the model to decide on the most significant words in the input sequence that needs to be considered to generate the target output. This attention mechanism is developed over time by having the model be trained on multiple sets of text data which in turn “teach” the model on what data to pay attention to in each context. Additionally, Transformers have Positional Encoding. Instead of looking at words sequentially, the word order information is encoded in the order of the words entered by numbering the sequence of words. Therefore, when training is done on text data, the model learns how to interpret the importance of word order.

## Large Language Model

LLMs models are general-purpose models at their core. This means, they are not customized for one specific type of text processing task. Hence, they are capable of being pre-trained and fine-tuned to cater to multiple text-processing tasks in NLP (Devlin *et al.*, 2019). In the pre-training phase, the model is trained on large corpuses of text for a specific task (text-generation, summarization, classification, question answering etc.) that give it a base understanding of language and its nuances and an overview of its target use-case. However, this step is insufficient in gaining functionality for a specific field (Howard and Ruder, 2018). Once pre-trained, the model needs to be further fine-tuned using data from the specific field that it is expected to operate in so that it is able to generate more relevant results rather than generalized outputs (Raffel *et al.*, 2020). This fine-tuning is done with a relatively small set of data from the relevant target field.

For example, the GPT-2 model, while trained on 8 million web pages and around 7 thousand books, can perform basic sentence completion (predicting the next word from the input) that is based on the data that it had been trained on. With this base model, getting sentence completions for a specific field is (such as story-writing in our case) is difficult since it has not been “fine-tuned” for that task and will generate a randomized output given an initial prompt and what the model evaluates the best next word to be (Howard and Ruder, 2018).

## Further Literature on Stories with LLMs

### *Plan-And-Write: Towards Better Automatic Storytelling*

Open-domain story generation, focusing on generating stories from given titles is explored (Yao *et al.*, 2019). It introduces the hierarchical generation Plan-And-Write framework, which first plans a storyline and then generates a story based on the storyline. The framework employs two planning strategies: dynamic schema and static schema. The dynamic schema combines story planning and surface realization, while the static schema plans the entire storyline before generation.

This framework can enhance the generation by producing understandable stories that follow the topic. These stories are evaluated both automatically and using human feedback as done in the previous works mentioned.

### *A Temporal Variational Model for Story Generation*

A Temporal Difference Variational Autoencoder (TD-VAE) model is used to generate stories (Wilmot and Keller, 2021). It aims to enhance plot development and coherence in stories generated by LLMs. Here it can be seen that the operation of the TD-VAE in story generations have significant improvements over stories generated using GPT-2 baseline. Similar to the previous explorations, the human evaluations prefer the improved model generations. One point of challenge was the balance between technical efficiency and the creativity of the generated story.

### *Hierarchical Neural Story Generation*

This aims to create coherent and fluent text passages based on a given topic, utilizing human-written stories paired with writing prompts from the WritingPrompts forum of Reddit (Fan, Lewis and Dauphin, 2018). The model first generates a premise and then expands it into a full passage. It introduces the innovative “model fusion” and gated multi-scale self-attention mechanisms to improve the relevance of the story to the prompt and handle long-range context. This methodology attempts to solve the problem of LLMs drifting off-topic in generations. This makes possible to generate longer and more consistent stories.

Similar to the other exploration, large improvements over strong baselines found both in automated and human evaluations.

### *PLOTMACHINES: Outline-Conditioned Generation with Dynamic Plot State Tracking*

Story generation using outlines and dynamic plot state tracking by introducing PLOTMACHINES, a neural narrative model that transforms outlines into coherent stories while tracking dynamic plot states (Rashkin

*et al.*, 2020). Here, a high-level discourse structure is used to learn different writing styles in different parts of a narrative.

This was achieved by performing experiments which used three fiction and non-fiction datasets. Here, large-scale language models like GPT-2 and GROVER in generating coherent narratives was explored. This method was shown to enhance coherence and plot consistency in generations and was favoured by both human and automated evaluations.

### *Transformer-based Conditional Variational Autoencoder for Controllable Story Generation*

The research attempts enhancing the generation effectiveness and controllability in long text generation using a Transformer-based conditional variational autoencoder (CVAE) (Fang *et al.*, 2021). Combining latent representation vectors with a pre-trained Transformer architecture, specifically GPT-2, shows enhanced controllability without compromising generation effectiveness.

The model's state-of-the-art conditional generation ability is shown with excellent representation learning capability and controllability. This implementation shows promising results in the issues of controllability in generating long text with Transformer-based models.