EE P 500 D: LLMs and ChatGPT

Prompt Engineering | ChatGPT | Fine-Tuning | Demos | Coding

Dr. Karthik Mohan, Nov 11 2023 | LLM Short Course | PMP, ECE

Course Outline

November 11

- Logistics and Motivation
- Introduction to LLMs
- Embeddings

November 12

- Prompt Engineering
- LLM Models
- Fine-Tuning LLMs

November 18

- Data Augmentation
- LLMs in production
- Question Answering

November 19

- LLM Ecosystem
- LangChain
- Recap
- Project Presentations

Every Class

First 75 Minutes

- Theory
- Demos

Next 10 minutes

- In-Class Exercise

Next 1.5 hours

- In-class Coding Demo
- In-class Coding Exercise

Every Class

First 75 Minutes

- Theory
- Demos

Next 10 minutes

- In-Class Exercise

Next 1.5 hours

- In-class Coding Demo
- In-class Coding Exercise

Every Class

First 75 Minutes

- Theory
- Demos

Next 10 minutes

- In-Class Exercise

Next 1.5 hours

- In-class Coding Demo
- In-class Coding Exercise

Course Webpage and Resources

https://bytesizeml.github.io/llm_short_course/

Assignments

Deadline	Assignment	Description
November 11th	Assignment 0	Prep, set up and getting hands-on
		with language models plus
		work a simple demo
		Example of a simple demo
November 18th	Conceptual	Test your understanding
	assignment	of the concepts and theory
		behind LLMs
November 18th	Mini-Project	Use of Chat GPT, LLMs
		on sentiment extraction or
		chat-bot simulation with a
		working demo hosted on a webpage
November 19th	Mini-Project	8 minutes per team
	Presentation	

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

Transfer Learning to smaller models

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

Transfer Learning to smaller models

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

Transfer Learning to smaller models

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

Transfer Learning to smaller models

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

Transfer Learning to smaller models

More use cases!

ChatGPT use cases for NLP

Prompt Engineering for information retrieval

Data Augmentation

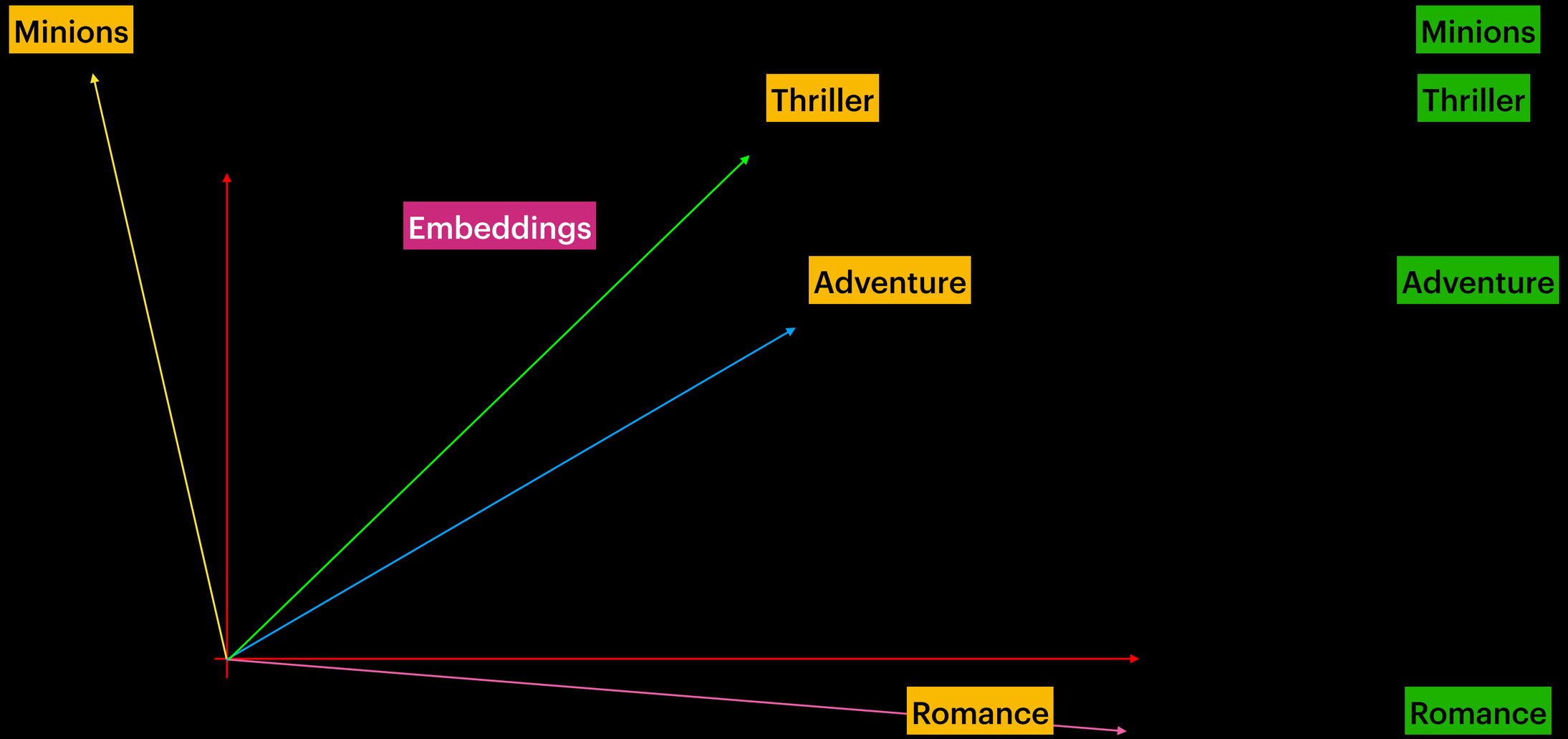
Transfer Learning to smaller models

Open AI embeddings for Semantic Search

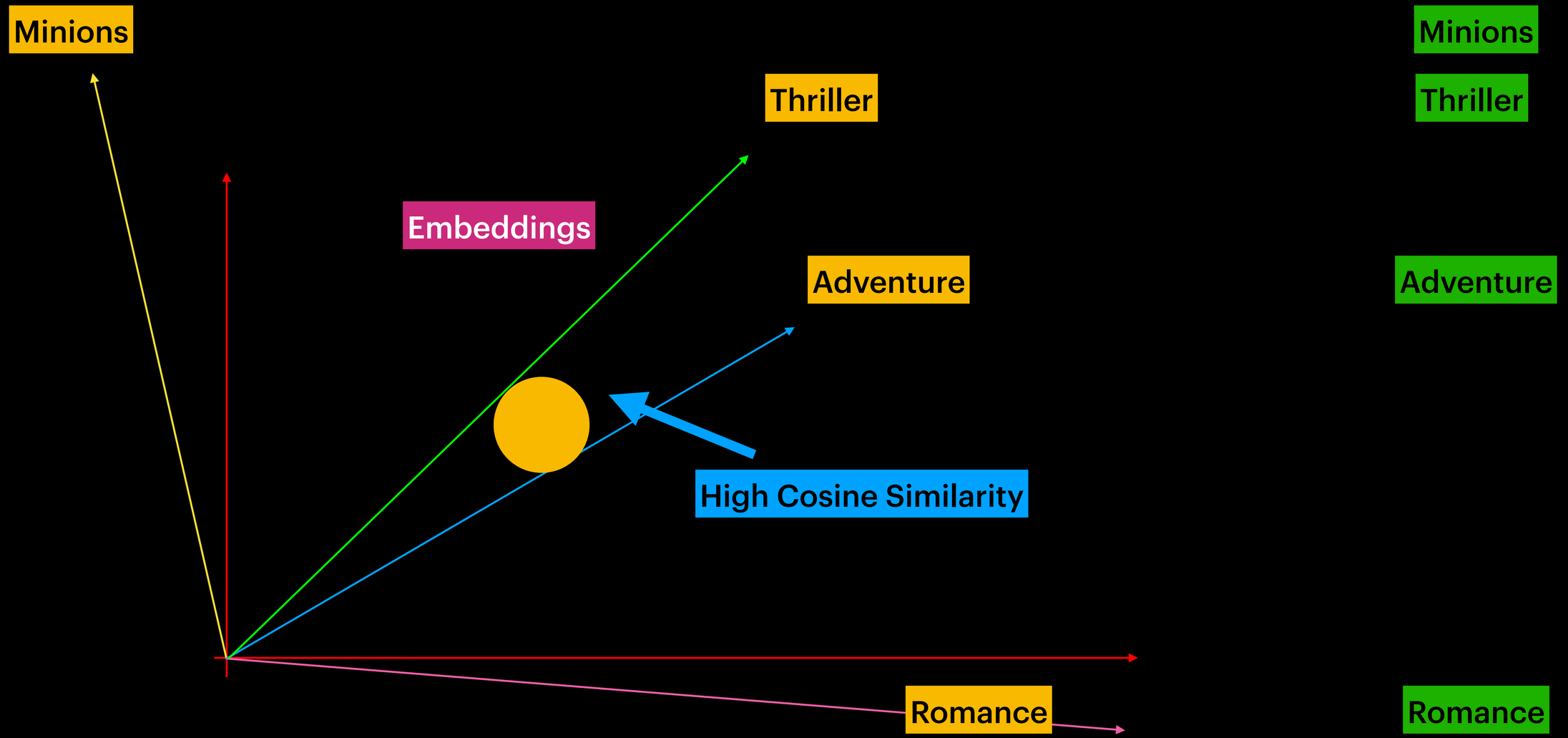
Today's Focus

- Prompt Engineering for information retrieval
- Data Augmentation
- Transfer Learning to smaller models

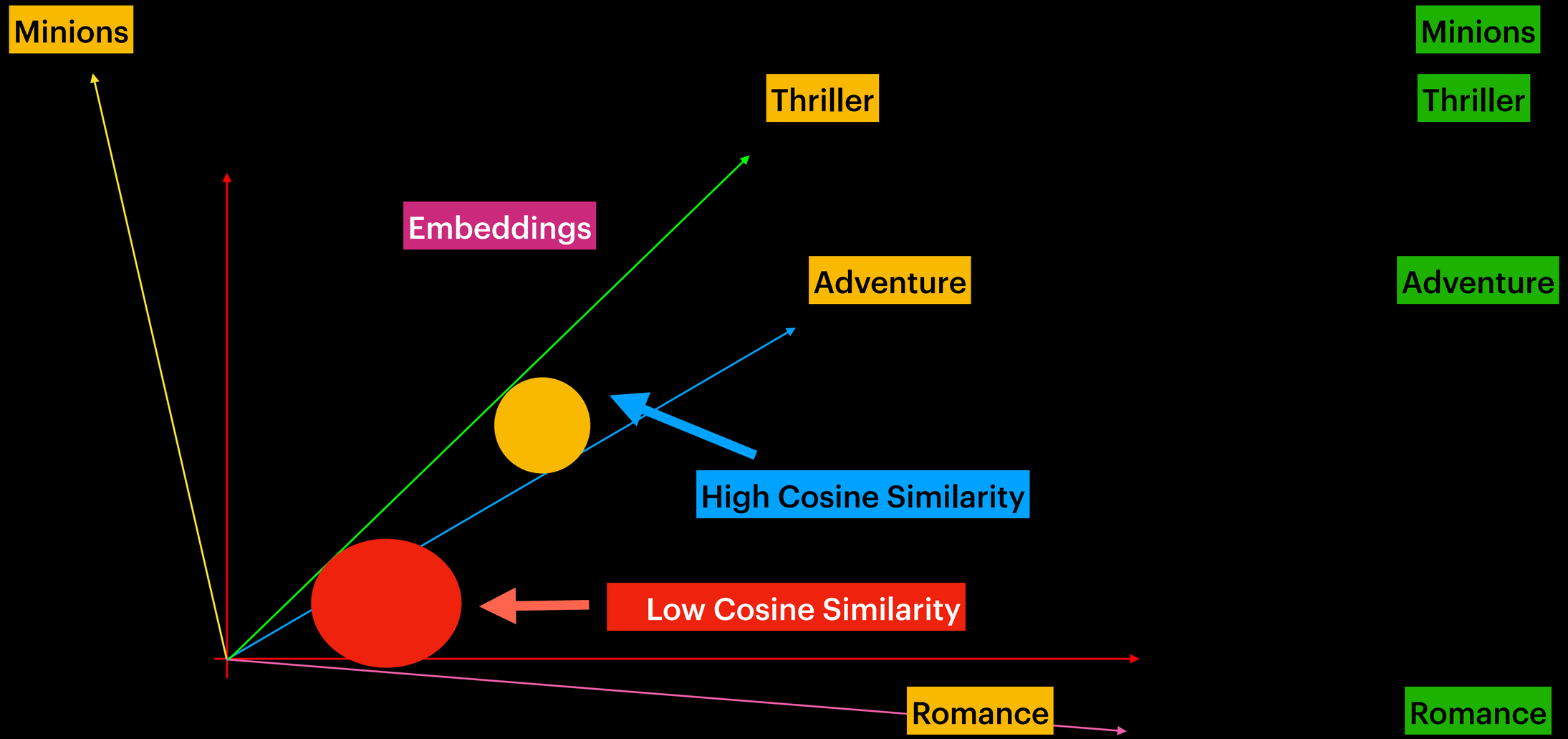
Recap on Embeddings & Cosine Similarity



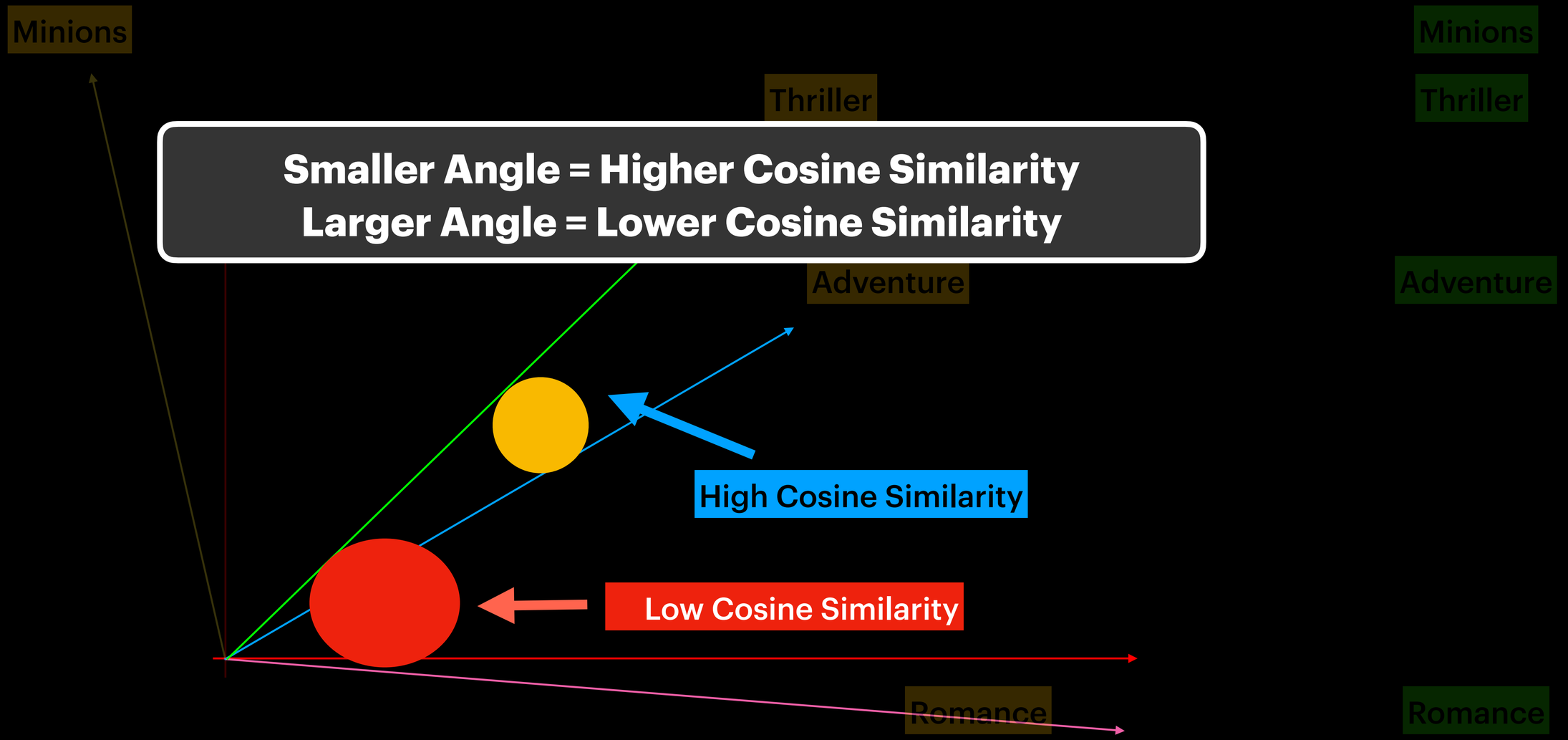
Recap on Embeddings & Cosine Similarity



Recap on Embeddings & Cosine Similarity



Recap on Embeddings & Cosine Similarity



Notebook Demo

Prompt Engineering

KeyWord Extraction

Data Augmentation

Notebook Demo

Prompt Engineering

KeyWord Extraction

Data Augmentation

Notebook Demo

Prompt Engineering

KeyWord Extraction

Data Augmentation

Prompt Engineering - Notebook Demo

Let’s go take a look!

Pointers for effective prompt engineering

- **Clarity in Instructions, Goals**
- **Providing context**
- **Specificity/Conciseness**

Pointers for effective prompt engineering

Clarity in Instructions, Goals

Providing context

Specificity/Conciseness

Example from the notebook

The key word doesn’t have to be present in the text. Also the key word shouldn’t have a space in it.

Pointers for effective prompt engineering

Clarity in Instructions, Goals

Providing context

Specificity/Conciseness

Pointers for effective prompt engineering

Clarity in Instructions, Goals

Providing context

Specificity/Conciseness

Example from the notebook

One question should be something a five year old would ask. Another second should be something a mature adult would ask.

Pointers for effective prompt engineering

Clarity in Instructions, Goals

Providing context

Specificity/Conciseness

Pointers for effective prompt engineering

Clarity in Instructions, Goals

Providing context

Specificity/Conciseness

Example from the notebook

Generate 3 distinct key words that capture the most important topics in the text.

Next Lecture (November 18 2023)

1. More on industry-scale applications of ChatGPT

2. LangChain

3. Multi-Modal Applications (Text + Image)

4. LLM Agents

Let’s go through Fine-tuning Pre-Trained LLMs

Followed by In-class Coding on Prompting with ChatGPT API

Thank you!

References

Chip Huyen's blog: https://huyenchip.com/2023/05/02/rlhf.html

https://www.linkedin.com/pulse/meta-llama-vs-chatgpt-comprehensive-