Use cases PEO (Prompt Engineering Ontology)

Name: Use Case 1 - Optimizing LLM Responses
Description: Researchers use PEO ontology to design optimized prompts that can improve the quality of responses generated by a large language model.
Actors: Researcher, PEO ontology, LLM
Flow: The researcher uses the ontology to identify appropriate prompts for different types of tasks creating a set of selected prompts. Selected prompts are given as input to the large language model and responses are evaluated according to specific metrics on consistency, completeness and quality decided by the researcher.

Name: Use Case 2 - Bias analysis
Description: Researchers use PEO ontology to generate responses and detect bias in large language models considered
Actors: Researcher, PEO ontology, LLMs
Flow: The researcher uses the ontology to generate prompts on sensitive topics (gender, ethnicity …) and prompts are tested on one or more large language models. Responses are collected using bias and fairness metrics and results are collected in order to improve prompts and considered models.

Name: Use Case 3 - Code generation
Description: Developers use prompt engineering techniques applied to a chosen large language model to generate source code in a specific programming language for a specific task.
Actors: Developers, PEO ontology, LLM.
Flow: The developer is working on an Android application written in Java and needs code to control the actions on a button. Using the ontology, he chooses the most appropriate prompt engineering technique and applies it to the creation of the prompt to a large language model of his choice,

resulting in Java code as output. The code is tested and integrated into the application.

Name: Use Case 4 - Prompt engineering lesson
Description: The teacher uses PEO ontology to teach prompt engineering techniques exploring different techniques and prompt described.
Actors: Teacher, students, PEO ontology.
Flow: The teacher opens the ontology and shows with proper explanation different prompt engineering techniques represented in the ontology.

Name: Use Case 5 - Large language models lesson
Description: The teacher uses PEO ontology to teach different large language models available.
Actors: Teacher, students, PEO ontology.
Flow: The teacher opens the ontology and shows with proper explanation different large language models represented in the ontology.

Name: Use Case 6 - Social media content creation
Description: The content creator uses PEO ontology to generate prompts that optimize the creation of articles, social media posts and other textual content.
Actors: Content creator, PEO ontology, LLM
Flow: The content creator opens the ontology and chooses the appropriate technique in order to generate text for a post on social media using a specific large language model. The content creator adapts the response according to his target.

Name: Use Case 7 - Image generation
Description: The content creator uses PEO ontology to create a prompt to be given as input to a specific large language model capable of generating an image.
Actors: Content creator, PEO ontology, LLM

Flow: The content creator wants to create an AI-generated image for a video and he uses the ontology to choose the best large language models able to generate image, he chooses the prompt engineering technique to create the prompt in order to generate image. He watches the output and he continues to use the ontology to generate prompts in order to refine the image.

Name: Use Case 8 - Prompt engineering experiments
Description: Students use PEO ontology to explore and create effective prompts to improve language model responses.
Actors: Students, PEO ontology, LLM
Flow: Students explore the ontology in order to understand different prompting techniques applying them to a chosen large language model.

Name: Use Case 9 - Large language models learning
Description: Students use PEO ontology to learn different types of large language models
Actors: Students, PEO ontology
Flow: Students explore different large language models represented in the ontology and the relationships among them, learning all the features of each large language model.

Name: Use Case 10 - Using the Ontology to Generate a Prompt for explaining computer science topics
Description: Student wants to generate a prompt using PEO ontology in order to explain a computer science topic.
Actors: Student, PEO ontology, LLM
Flow: The student uses the ontology to choose the most appropriate prompt engineering technique in order to generate using large language models. The student reads the obtained LLM response and can create a new prompt using another technique represented in the ontology.