PROBLEM STATEMENT

With the help of Prompt engineering concept and construct implement the below problem. The Project work starts with brief introduction of architecture of LLMand VLM

Design a chatgpt enabled website leveraging full stack embedded with chatbot using generative AI for travel plannerapplication.

Large Language Models

What are
LARGE LANGUAGE MODELS

Large language models (LLMs) are a category of foundation models trained on immense amounts of data making them capable of understanding and generating natural language and other types of content to perform a wide range of tasks.

A large language model (LLM) is a computational model capable of language generation or other natural language processing tasks. As language models, LLMs acquire these abilities by learning statistical relationships from vast amounts of text during a self-supervised and semi-supervised training process.

Structure of AN LLM

Large Language Models (LLMs) are built on the Transformer architecture, which is designed to process sequences of text efficiently and capture long-range dependencies. These models rely on layers of attention mechanisms, feed-forward networks, and token embeddings to process text in parallel, enabling them to understand and generate human-like language.

Input Embeddings

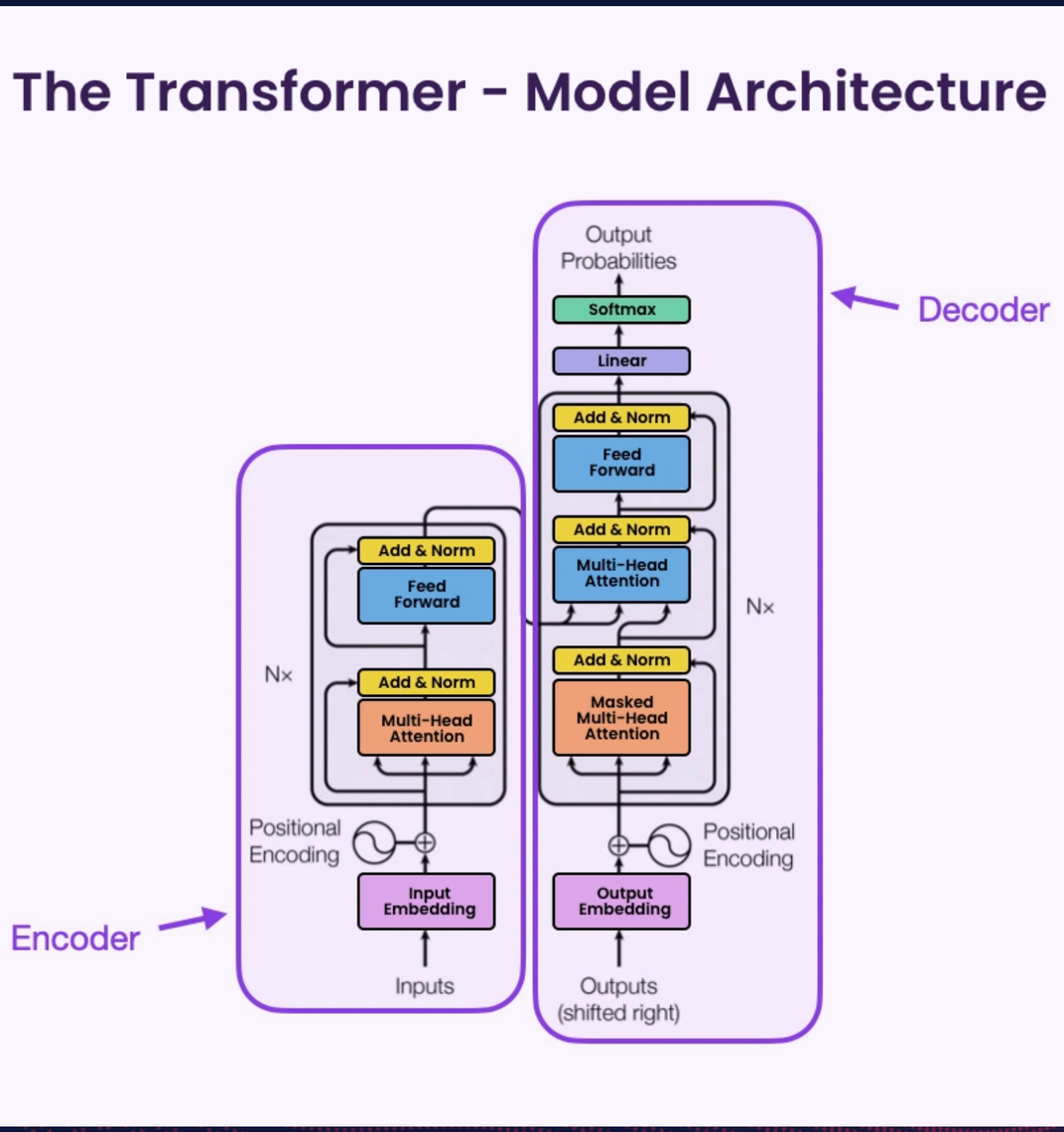
Converts raw text tokens (words, subwords) into dense vector representations.
Includes positional encodings to retain the order of tokens in the input sequence.

Multi-Head Self-Attention

Allows the model to focus on different parts of the input text simultaneously.
Enables the model to understand contextual relationships between words across a sequence by attending to relevant tokens at each position.

Feed-Forward Networks (FFN)

Consists of fully connected layers applied to each token's representation.
Introduces non-linearity, helping the model to capture complex patterns in the data. These networks operate independently on each token after the attention layer.



TRANSFORMERS

Transformers revolutionized the development of Large Language Models (LLMs) by introducing a highly efficient architecture that processes entire sequences of text in parallel. The key innovation of transformers is the self-attention mechanism, which enables the model to weigh the importance of different words in a sentence and capture long-range dependencies. This ability to understand context over large sequences, along with parallel processing, allows transformers to scale effectively, making them the foundation for powerful LLMs like GPT and BERT. Their architecture has led to breakthroughs in tasks like language generation, translation, and comprehension.

Vision Language MODELS

Vision-Language Models (VLMs) are multimodal models designed to process both visual and textual data, allowing them to understand and generate language in the context of images. These models combine the strengths of image recognition and natural language understanding to perform tasks like image captioning, visual question answering, and text-to-image generation. VLMs leverage transformer-based architectures to align visual features with language, making them highly effective in applications requiring a combination of both modalities.

Vision Encoder

Typically uses Convolutional Neural Networks (CNNs) or Vision Transformers (ViTs) to extract features from images and represent them as embeddings.

Text Encoder

A transformer-based language model processes the text input, converting it into embeddings that can interact with the visual data.

Cross-Modal Attention

Aligns and integrates visual and textual representations, allowing the model to establish connections between image content and corresponding language, enabling coherent multimodal understanding

Prompt Engineering

Prompt engineering is the process of designing and optimizing input prompts to guide language models in generating specific, accurate, and relevant responses.

01

Zero-Shot Prompting

No examples are provided; the model is simply given an instruction or query, and it generates a response based on its pre-trained knowledge.

02

Few-Shot Prompting

A few examples of the task are included within the prompt to guide the model in understanding the desired output format and context.

03

Chain-of-Thought Prompting

Encourages the model to think through its reasoning by asking it to generate intermediate steps or explanations before arriving at a final answer, improving logical accuracy.

04

Task-Specific Prompting

Prompts are tailored for specific tasks, including domain-specific terminology or explicit instructions, to achieve more targeted responses aligned with a particular objective.

THANK YOU