

## Questions and Answers

### **1. What are Large Language Models (LLMs), and how do they differ from traditional AI systems in terms of training and functionality?**

Large Language Models (LLMs) are a specific type of AI system built using deep learning techniques, particularly transformer architectures, and trained on vast amounts of text data. Unlike traditional AI systems, which might be programmed with specific rules or rely on smaller, more curated datasets, LLMs learn patterns and relationships directly from massive amounts of text. This pretraining on massive datasets, followed by fine-tuning for specific tasks, allows them to generate human-like text, answer questions, and perform various NLP tasks like summarization or translation, functionalities that traditional AI systems often struggle with or require significantly more manual effort to achieve. In essence, LLMs leverage the power of scale and deep learning to achieve more human-like language capabilities than many earlier AI approaches.

### **2. The text mentions several challenges associated with LLMs. Identify and explain at least two of these challenges, and briefly discuss why they are significant concerns.**

Two significant challenges associated with LLMs are biases in training data and the potential for misinformation. **Biases in Training Data:** LLMs are trained on massive datasets scraped from the internet. If these datasets contain biases (e.g., gender, racial, or political biases), the LLM will likely learn and perpetuate those biases in its outputs. This can lead to unfair or discriminatory outcomes in applications like loan applications, resume screening, or even seemingly innocuous tasks like text generation, reinforcing harmful stereotypes or prejudices. **Potential for Misinformation:** Because LLMs are trained to generate text that is grammatically correct and contextually relevant, they can be used to create convincing but factually incorrect or misleading content. This poses a significant threat to public discourse and can be exploited to spread propaganda, manipulate opinions, or create "deepfakes" that are difficult to distinguish from reality. The ease with which LLMs can generate large volumes of convincing misinformation makes this a particularly pressing concern.