Assignment 11 - [Prompting]

Question 1:-

Prompting Engineering:

In order to generate desired output like LLM AI guide models are used to refine input is called prompt engineering. To get relevant responses it involves crafting the statements.

Question 2:-

Prompt Injection:

By introducing harmful or misleading instructions where AI model intended behaviour is altered by malicious user and their technique is called prompt injection.

Types of Injection:

(i)Data Injection

(ii)Instruction Injection.

Question 3:-

Key Advantage of RAG:

With the help of external knowledge RAG has the capability to enhance LLM by generating, enabling models

(i)Updated and specific information to access real-time.

(ii)The generated text factual correctness is improved by reducing hallucination.

(iii)More complex dense task information are supported.

Question 4:-

Essential components of ReAct Prompting Framework:

ReAct Prompting Framework generates the actionable solution for complex problem by prompting the reasoning and action in a combinational manner. The essential components are reasoning and action.

Question 5:-

Main advantages of Dense Retrieval Over Sparse Retrieval in RAG System:

(i)Nuanced and complex queries for better performance
(ii)More documents are relevant for higher retrieving and recall.
(iii)Matching relies on exact term in lexical variation.

Question 6:-

Top-k sampling with k=3

1àWord C: 0.45

2àWord D: 0.20
3àWord A: 0.15

Question 7:-

The smallest candidate set that meets the probability threshold top-p sampling with p=0.7

Word A: 0.45 Word B: 0.25

WordA +WordB = 0.45 + 0.25 = 0.7

The combination of WordA & WordB probability reaches the threshold.

Question 8:-

Factors influenced by the "temperature"

(i)Coherence-Structured response and more coherence are produced at low temperature
 (ii)Exploration-Encourage exploration at higher temperature.

(iii) Creativity-More diverse and creative responses for higher temperature, while lower temperature values result in more deterministic and predictable output.

Question 9:-

Main advantages of COT over ZERO-SHOT prompting:

Prompting encourages in COT by reasoning step by step which leads to

(i)Problem-solving and reasoning accuracy are improved

(ii)Multi-step tasks and complex performance are better by articulating intermediate steps as it forces the model to do it.

Question 10:-

Advantages of Auto-COT over COT

(i)Generating the reasoning by multiple chains in an automatic manner.

(ii)Reduces the manual manner of prompt engineering.

(iii)Without human intervention it improves various reasoning path test performance.

Question 11:-

Advantages of meta prompting

(i)Adaptability-The task requirements enable prompt creation dynamically.

(ii)Versatility- Flexible approaches are required for complex or creative domains
 (iii)Robustness- To suit different objectives and contexts by adjusting prompts where wide range of tasks can be handled.

Question 12:-

Top-k parameter for control temperature

(i)**Temperature Increase**: For producing more original text and less deterministic to encourage creativity and diversity and.

 (ii) **Less top-k value**: To include less unexpected or common words a wider range generates the text remains plausible by ensuring the creativity.