**ReAct Prompting with Large Language Models (LLMs)**

**-By Divyanshu Gupta**

1. **Overview**

A novel prompting framework known as **ReAct** (*Reasoning + Acting*), designed to enhance the performance of Large Language Models (LLMs) by enabling them to both think (reason) and act (interact with tools) during task execution was introduced.

1. **How ReAct Works**

The ReAct framework consists of iterative steps:

* **Thought:** The LLM reasons internally.
* **Action:** It performs an external task (e.g., web search).
* **Observation:** The outcome from the environment is used.
* **Finish:** The result or answer.

This process is **interleaved**, allowing LLMs to form plans, take steps, revise based on outcomes, and deliver more accurate results.

1. **Example (HotPotQA)**

**A screenshot of a computer program

AI-generated content may be incorrect.**

1. **Knowledge-Intensive Reasoning**

* **Benchmarks:** HotPotQA (QA), FEVER (Fact Verification)
* **Findings:**
  + Outperforms Act-only models.
  + Outperforms CoT on FEVER.
  + Slightly underperforms CoT on HotPotQA due to rigid structure.

1. **Decision-Making Tasks**

* **Benchmarks:** ALFWorld (text-based simulation), WebShop (shopping simulation)
* **Results:**
  + ReAct outperforms Act by better subgoal decomposition.
  + Thought-driven planning improves accuracy in complex environments.

1. **Strengths and Limitations**

**Strengths:**

* Enables knowledge updates via external tools.
* Improves factual accuracy.

**Limitations:**

* Heavily depends on quality of retrieved data.
* Structuring thoughts can sometimes limit flexibility.

1. **Summary Points**

* **ReAct** is a prompting framework that **combines reasoning with actions**, improving LLM interaction and factual correctness.
* It uses **Thought → Action → Observation** loops to generate traceable and effective results.
* It performs well on **reasoning** (HotPotQA, FEVER) and **decision-making tasks** (ALFWorld, WebShop).
* **Lang Chain** offers practical implementation support using APIs and built-in tools.
* ReAct provides an ideal foundation for building **LLM-powered agents** that interact with external systems in real time.