artificial.

AI Engineer Intern Technical Task

Thank you for applying for the AI Engineer Intern position at Artificial!
We invite you to complete this technical task, which consists of a code submission and some accompanying written questions to answer. We provide you with a free OpenAI proxy below, to be used when completing the task.

Consider the two player game, Twenty Questions:

> Player 1 thinks of an object at the beginning of the game.
> Player 2 starts the game by asking questions. Player 2 can only ask questions that can be answered with 'yes' or 'no', and Player 1 must always answer truthfully 'yes' or 'no'.
> Player 2 may attempt to guess Player 1's object at any point in the game, which counts as a question.
> Player 2 wins if they guess Player 1's object before they have exhausted their limit of twenty questions. Otherwise, Player 1 wins.

Part 1
Design and implement an interface where a user can play twenty questions with an LLM. The user should be able to play both as Player 1 and Player 2.
The interface can be graphical or through a CLI. Explain the different techniques that you have used to ensure the program doesn't have any unexpected behaviour.

Part 2
Extending your implementation from part 1, include a mode where two LLMs are playing the game against each other.

Part 3
Write about how you would implement a scheme to automatically evaluate the performance of an LLM as Player 1 and Player 2. What emergent behaviour might you expect to see if the LLM was trained on its performance in this game? How would you prevent/encourage this?

This assignment is designed to evaluate how you write code around LLMs. We are interested in your approach to architecting this solution, and enabling the extensions in part 2 and 3. A logical approach and business-oriented thinking will be highly valued.
We understand you may be busy, so please don't spend excessive time striving for perfection — this is not the purpose of the assignment.

You are welcome to use any tools or programming languages, though a Python backend is preferred. Please submit your code (along with any optional documents that might help clarify your approach) by the agreed deadline. You can do this by sharing files directly or via an online code repository (e.g., GitHub). If you have any questions or require any clarifications, feel free to get in touch with us.

Thank you and good luck!

How to access our free LLM API service

We have provided a free LLM proxy available at:
https://candidate-llm.extraction.artificialos.com/v1/responses
The specification of this proxy API is almost identical to the OpenAI API here:
https://platform.openai.com/docs/api-reference/
However, to authenticate with the proxy API, you must attach this header to your requests.
`x-api-key: <CANDIDATE_API_KEY>`

Example usage:

```python
import requests

CANDIDATE_API_KEY = ""
BASE_URL = "https://candidate-llm.extraction.artificialos.com/v1/responses"

response = requests.post(
    BASE_URL,
    headers={
        "Content-Type": "application/json",
        "x-api-key": CANDIDATE_API_KEY
    },
    json={
        "model": "gpt-5-mini-2025-08-07",
        "input": [
            {
                "role": "user",
                "content": "How many times does the letter r appear in the word strawberry?"
            }
        ]
    }
)
print(response.json())
```

The candidate API key will have been provided to you separately when sharing the assignment.

Note: we are tracking key usage and encourage the use of the `gpt-5-mini-2025-08-07` model over the others that are available.