Software Developer Assignment – The Emerging Media Lab, UBC

Hello!

Thank you for being willing to take our test for the position of Software Developer at **The Emerging Media Lab** at **The University of British Columbia**.

This is your assignment that must be completed **by October 30th, 2024, at 12:00pm**.

This assignment will play a significant role in the next step of your application. It has some minimum requirements, but it is **loosely defined** to give you the freedom to add your own creative spin. **Surprise us** with your implementation!

And don't worry – if you're inexperienced with this exact scenario, we understand. This is a chance for us to see how efficiently you can **learn new technologies** and demonstrate your enthusiasm for **solving new problems**.

Assignment: Blueprint Function Library for AI Communication

Objective:

Create a **Blueprint Function Library** in **Unreal Engine 5** that allows **sending and receiving messages from an AI endpoint** via **C++ integration**.

Description:

You will design and implement a **custom blueprint function library** that enables communication with an **AI endpoint**. For testing purposes, we suggest using a **local installation of OLLama** (https://ollama.com/) or any other accessible AI endpoint of your choice. Ensure that the endpoint you choose is functional and easy to test from our end.

Assignment Details:

1. **Blueprint Function Library Setup:**
    a. Create a **C++ Blueprint Function Library** in Unreal Engine 5.
    b. The library should contain **at least two functions**:
        i. **SendMessageToAI:** Sends a text input to the AI endpoint.
        ii. **ReceiveMessageFromAI:** Receives and returns the response from the AI endpoint.
2. **AI Endpoint Communication:**
    a. Use **HTTP requests** or any other appropriate communication protocol to interact with the AI endpoint.
    b. If using OLLama or a similar local endpoint, ensure the function library can correctly send text prompts and receive responses.
3. **Blueprint Integration:**
    a. Expose the functions to Unreal Engine's blueprint system so they can be used in **game logic or a UI blueprint**.
    b. Demonstrate the communication by creating a **simple UI blueprint**:
        i. A **text input field** for user prompts.
        ii. A **submit button** to send the prompt.
        iii. A **response display area** showing the AI's reply.
4. **Testing and Error Handling:**
    a. Ensure that the library handles errors gracefully, such as **unreachable endpoints** or **empty inputs**.

Estimated Time:

The assignment is designed to be completed in approximately **3 hours**. Focus on achieving the core functionality first, and feel free to add **creative enhancements** if time permits.

Bonus Suggestions:

- Add **loading indicators** while waiting for the AI's response.
- Include **multiple AI endpoints** with a dropdown selector in the UI.
- Take **protective measures** to avoid sending unnecessary or duplicate requests.

Submission Guidelines

1. **GitHub Repository:**
    a. Implement the described solution on a **public GitHub repository**.
2. **Documentation:**
    a. Document the development process thoroughly for both the **C++ and blueprint aspects**.
    b. Share insights into your **decision-making process**, such as why you chose a particular endpoint or communication method.
    c. Include **flowcharts or diagrams** if they help explain your approach.
3. **Commit History:**
    a. Use meaningful **commit messages** that reflect your thought process.
    b. Ensure your commits provide a clear view of how your solution evolved during development.
    c. Commit frequently.
4. **Research:**
    a. Feel free to **conduct research** to enhance your solution. On the job, you won't be working in isolation, and we don't expect you to have all the answers immediately.

We are not looking for someone who knows everything, but rather someone who can figure things out **exceptionally well**. We want to see **effort, thoughtfulness, and problem-solving skills** through your code and documentation, as this will serve as a reflection of how you will perform as part of our team.

Good luck! We look forward to reviewing your work!