Home Assignment

**1. Implementing a Publisher and Consumer with Python using a Message Queue**

**Task:**

Implement a simple message queuing system using either Kafka or RabbitMQ. Your task includes writing a Python program for both a publisher and a consumer. The publisher will send messages to a channel called "ABC", and the consumer will subscribe to the same channel to receive messages.

**Instructions:**

* Choose either Kafka or RabbitMQ as your message queue system.
* Implement a Python program for the publisher that sends a series of messages (e.g., 10 messages) to the "ABC" channel.
* Implement a Python program for the consumer that subscribes to the "ABC" channel and prints out the received messages.
* Provide documentation on how to set up the message queue system and run your programs.

**Deliverables:**

* Python script for the publisher.
* Python script for the consumer.
* Documentation on setting up the message queue system and running the scripts.

**2. Creating a Service to Monitor CPU Usage and Send Alerts**

**Task:**

Explain the steps required to create a service that monitors CPU usage on an operating system and sends an alert if the CPU usage exceeds 80%.

**Instructions:**

* Describe how you would implement this service.
* Include details on the programming language and libraries you would use.
* Explain how the service will continuously monitor the CPU usage.
* Describe the method of sending alerts (e.g., email, logging, notification).
* Provide a high-level pseudo-code or a flowchart of your solution.

**Deliverables:**

* A detailed explanation of the steps.
* Pseudo-code or a flowchart of the solution.

**Bonus Question**

**Understanding and Moving Multicast Messages Between Networks**

**Task:**

Explain what multicast is and how multicast messages can be moved between two networks.

**Instructions:**

* Provide a clear definition of multicast and its typical use cases.
* Describe the solutions or techniques used to move multicast messages between networks.
* Provide an example scenario to illustrate your explanation.

**Deliverables:**

* A written explanation covering all the points above.
* An example scenario to illustrate the solution.

**Assessment Instructions**

* Provide your answers and code in a zip file or a shared repository.
* Include a README file with instructions on how to run your code and any necessary setup.
* Submit your completed assessment within the given deadline.

This assessment will help evaluate your skills in message queuing systems, system monitoring, and network protocols. Good luck!