Submission Worksheet

Submission Data

Course: IT490-450-M2025

Assignment: IT490 MQ Test Individual

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Status: Submitted | **Worksheet Progress:** 100%

Potential Grade: 10.00/10.00 (100.00%)

Received Grade: 0.00/10.00 (0.00%)

Started: 6/9/2025 9:33:02 PM

Updated: 6/9/2025 10:14:04 PM

Grading Link: https://learn.ethereallab.app/assignment/v3/IT490-450-M2025/it490-mq-test-individual/grading/hs747

View Link: https://learn.ethereallab.app/assignment/v3/IT490-450-M2025/it490-mq-test-individual/view/hs747

Instructions

- Walkthrough: https://youtu.be/tgT0ZAxccbQ

1. Read all instructions and requirements first
2. Use any VM creation tool that gives you root access and persistent storage
    - VirtualBox, Multipass, cloud (Amazon, Google, Azure, etc) (Docker won't be an option here)
    - Create a hostname relevant to the assignment (i.e., test-individual)
    - Create a user of your ucid with a password, ensure relevant permissions
    - Hardward: 1GB Memory, 10GB Hard Drive
    - Install a server version of linux (i.e., Ubuntu Server 24.04)
    - Hint: You may want to get a base install working and use that as a cloning point for quicker destroy/create cycles
3. Use the example code from the master branch of https://github.com/MattToegel/IT490
4. Connect to the VM with two separate ssh connections
    - Run the RabbitMQServerSample.php file successfully in one instance
    - Run the RabbitMQClientSample.php file successfully in another instance
    - Proper data should be sent/received
5. Create a `setup.sh` script that automates the installation/setup logic
6. Fill in the below requirements
7. Submit and Export once done
8. Upload the PDF to your personal GitHub repo for the class
9. Upload the PDF to Canvas

Section #1: (7 pts.) Example Solution

Progress: 100%

Task #1 (3.50 pts.) - Working Example

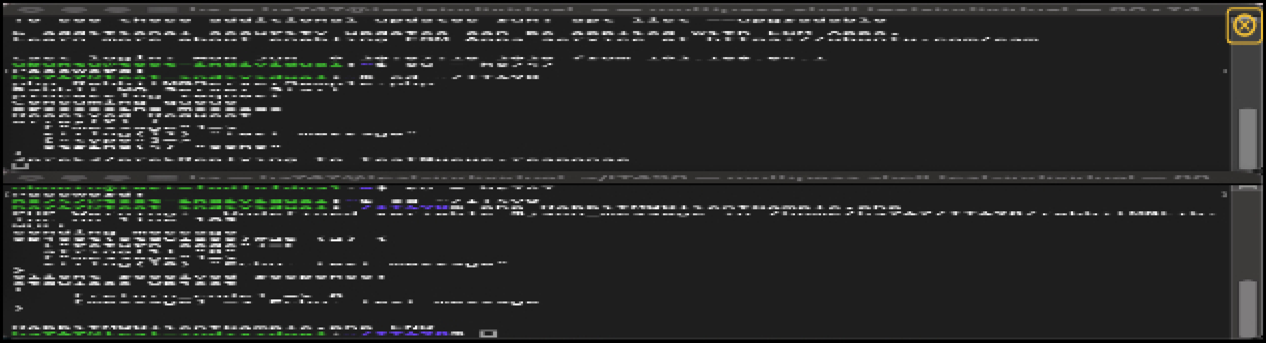
Progress: 100%

Part 1:

Progress: 100%

Details:

- Demonstrate a successful send/receive of the example message
- Hostname should be test-individual or similar
- Username should be your ucid



End-to-end RabbitMQ demo on test-individual VM:
the PHP server (top) logs receipt of "test
message", and the client (bottom) suc

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Part 2:

Progress: 100%

Details:

- Detail the initial setup experience and note things you had to address in order for the example to work

Your Response:

Initial Setup Experience & Troubleshooting

VM Platform Choice: I first tried Ubuntu Server on VirtualBox, but the installer repeatedly failed at GRUB installation. To avoid that, I switched to Multipass, which spun up an Ubuntu 24.04 VM in seconds without BIOS/kickstart issues.

User & Networking: Launched a test-individual VM with 1 GB RAM and 10 GB disk, created my hs747 account, and enabled SSH so I could open two concurrent sessions from my host.

Package Installation: Installed PHP, RabbitMQ, OpenSSH, Git and Composer via apt. When running composer install, it flagged a missing ext-bcmath dependency—so I installed php-bcmath.

Composer Schema Fix: The shipped composer.json had "type": "Some Value" which didn't match Composer's lowercase schema. I edited it to "type": "library", then composer install succeeded.

Service Enablement: Enabled & started the rabbitmq-server and ssh systemd services, ensuring the PHP samples could connect and persist across reboots.

Result: With dependencies in place and schema corrected, the RabbitMQ server & client PHP scripts ran end-to-end, demonstrating successful message send/receive.

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Task #2 (3.50 pts.) - Setup Script

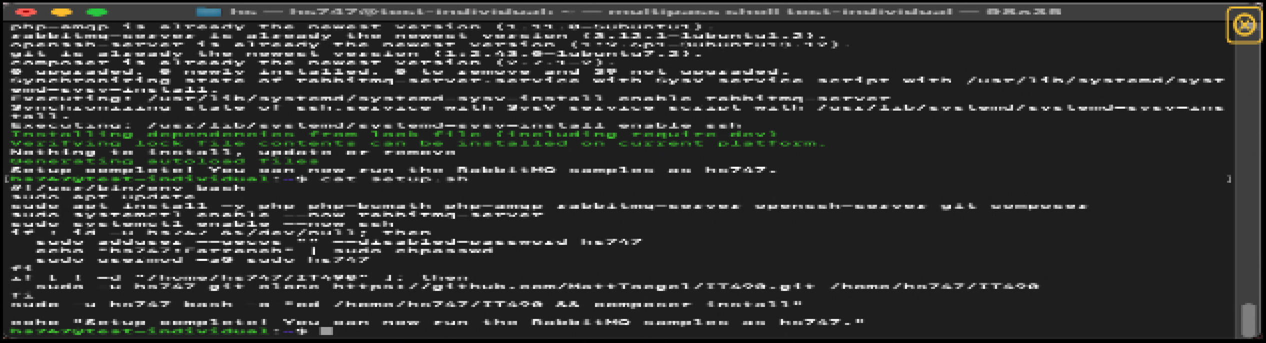
Progress: 100%

Part 1:

Progress: 100%

Details:

- Show a snippet of the `setup.sh` script you created to automate the installation and configuration steps that lead up to a working example.



```
php-amqp is already the newest version ([illegible]).
rabbitmq-server is already the newest version (3.12.1-1ubuntu1.2).
openssh-server is already the newest version ([illegible]).
git is already the newest version (1:2.43.0-1ubuntu7.2).
composer is already the newest version ([illegible]).
0 upgraded, 0 newly installed, 0 to remove and 39 not upgraded.
Synchronizing state of rabbitmq-server.service with SysV service script with /usr/lib/systemd/syst
emd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable rabbitmq-server
Synchronizing state of ssh.service with SysV service script with /usr/lib/systemd/systemd-sysv-ins
tall.
Executing: /usr/lib/systemd/systemd-sysv-install enable ssh
Installing dependencies from lock file (including require-dev)
Verifying lock file contents can be installed on current platform.
Nothing to install, update or remove
Generating autoload files
Setup complete! You can now run the RabbitMQ samples as hs747.
hs747@test-individual:~$ cat setup.sh
#!/usr/bin/env bash
sudo apt update
sudo apt install -y php php-bcmath php-amqp rabbitmq-server openssh-server git composer
sudo systemctl enable --now rabbitmq-server
sudo systemctl enable --now ssh
if ! id -u hs747 &>/dev/null; then
    sudo adduser --gecos "" --disabled-password hs747
    echo "hs747:[illegible]" | sudo chpasswd
    sudo usermod -aG sudo hs747
fi
if [ ! -d "/home/hs747/IT490" ]; then
    sudo -u hs747 git clone https://github.com/MattToegel/IT490.git /home/hs747/IT490
fi
sudo -u hs747 bash -c "cd /home/hs747/IT490 && composer install"

echo "Setup complete! You can now run the RabbitMQ samples as hs747."
hs747@test-individual:~$
```

Snippet of `setup.sh` showing automated package updates, installation of PHP (with bcmath & amqp), RabbitMQ, SSH, Git, Composer,

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Part 2:

Progress: 100%

Details:

- Include the direct link to the file from your personal class repository

URL #1

https://github.com/hsharifian/IT490/blob/master/setup.sh

URL

https://github.com/hsharifian/IT4

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Part 3:

Progress: 100%

Details:

- Briefly explain each step of the process in the script

Your Response:

1. #!/usr/bin/env bash
   Ensures the script runs under Bash on any system.

2. sudo apt update
   Refreshes Ubuntu's package index so you install the latest versions.

3. sudo apt install -y php php-bcmath php-amqp rabbitmq-server openssh-server git composer
   Installs:
   • PHP and the bcmath & AMQP extensions for the samples
   • RabbitMQ (message broker)
   • OpenSSH server (for SSH access)
   • Git (to clone the example code)
   • Composer (PHP dependency manager)

4. sudo systemctl enable –now rabbitmq-server
   Enables and starts RabbitMQ immediately and on boot.

5. sudo systemctl enable –now ssh
   Enables and starts SSH immediately and on boot.

6. if ! id -u hs747 &>/dev/null; then
   sudo adduser –gecos "" –disabled-password hs747
   echo "hs747:Farzaneh" | sudo chpasswd
   sudo usermod -aG sudo hs747
   fi
   Checks for an existing `hs747` account; if missing, creates it, sets your password, and grants sudo rights.

7. if [! -d "/home/hs747/IT490"]; then
   sudo -u hs747 git clone https://github.com/MattToegel/IT490.git /home/hs747/IT490
   fi
   Clones the example repo into `hs747`'s home directory if it isn't already there.

8. sudo -u hs747 bash -c "cd /home/hs747/IT490 && composer install"
   Runs `composer install` as `hs747` to fetch PHP libraries and generate `vendor/autoload.php`.

9. echo "Setup complete! You can now run the RabbitMQ samples as hs747."
   Prints a confirmation that the automated setup finished successfully.

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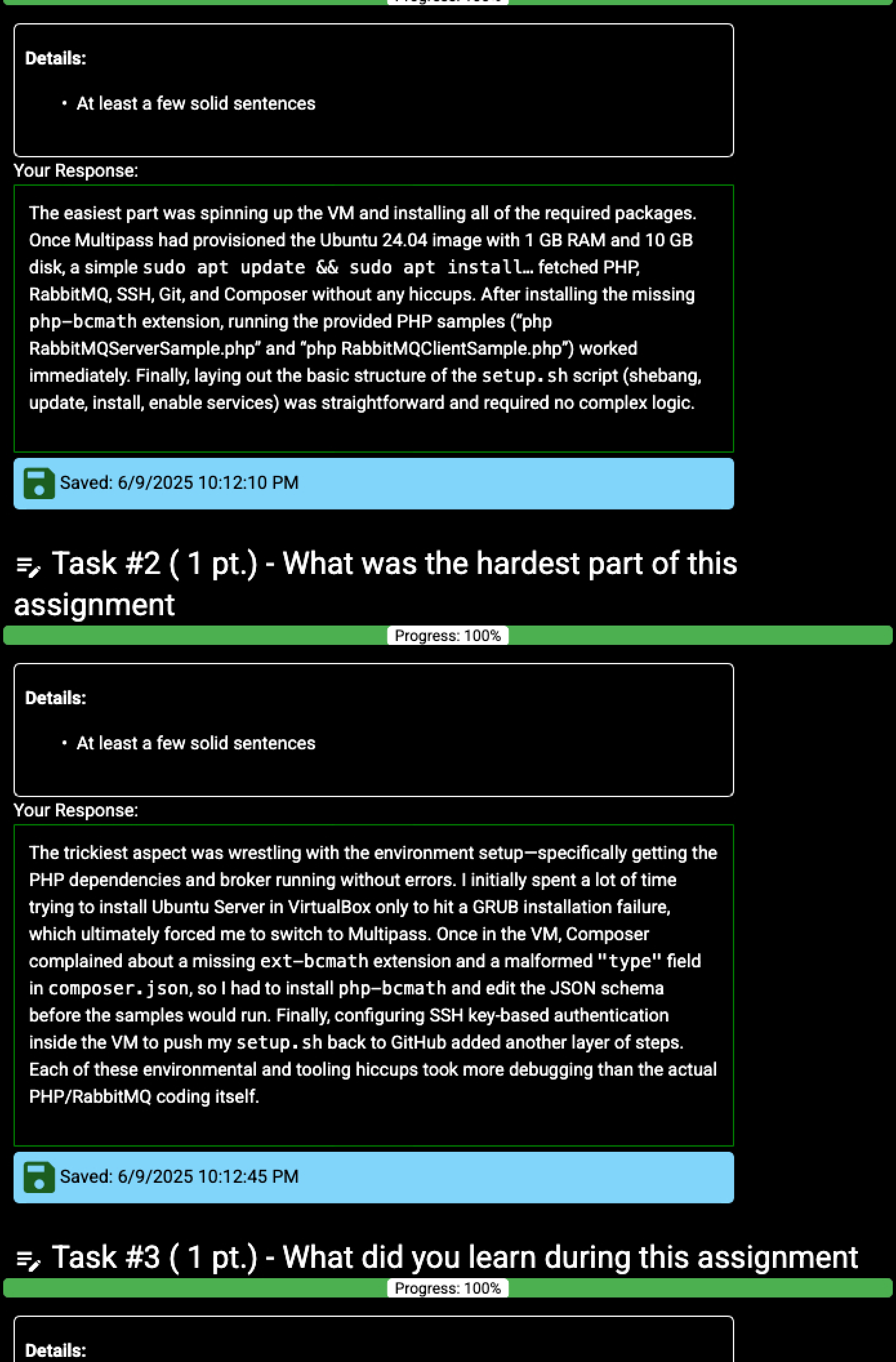
Section #2: (3 pts.) Reflection

Progress: 100%

Task #1 (1 pt.) - What was the easiest part of this assignment

Progress: 100%



Details:

- At least a few solid sentences

Your Response:

The easiest part was spinning up the VM and installing all of the required packages. Once Multipass had provisioned the Ubuntu 24.04 image with 1 GB RAM and 10 GB disk, a simple `sudo apt update && sudo apt install`… fetched PHP, RabbitMQ, SSH, Git, and Composer without any hiccups. After installing the missing `php-bcmath` extension, running the provided PHP samples ("php RabbitMQServerSample.php" and "php RabbitMQClientSample.php") worked immediately. Finally, laying out the basic structure of the `setup.sh` script (shebang, update, install, enable services) was straightforward and required no complex logic.

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Task #2 (1 pt.) - What was the hardest part of this assignment

Progress: 100%

Details:

- At least a few solid sentences

Your Response:

The trickiest aspect was wrestling with the environment setup—specifically getting the PHP dependencies and broker running without errors. I initially spent a lot of time trying to install Ubuntu Server in VirtualBox only to hit a GRUB installation failure, which ultimately forced me to switch to Multipass. Once in the VM, Composer complained about a missing `ext-bcmath` extension and a malformed `"type"` field in `composer.json`, so I had to install `php-bcmath` and edit the JSON schema before the samples would run. Finally, configuring SSH key-based authentication inside the VM to push my `setup.sh` back to GitHub added another layer of steps. Each of these environmental and tooling hiccups took more debugging than the actual PHP/RabbitMQ coding itself.

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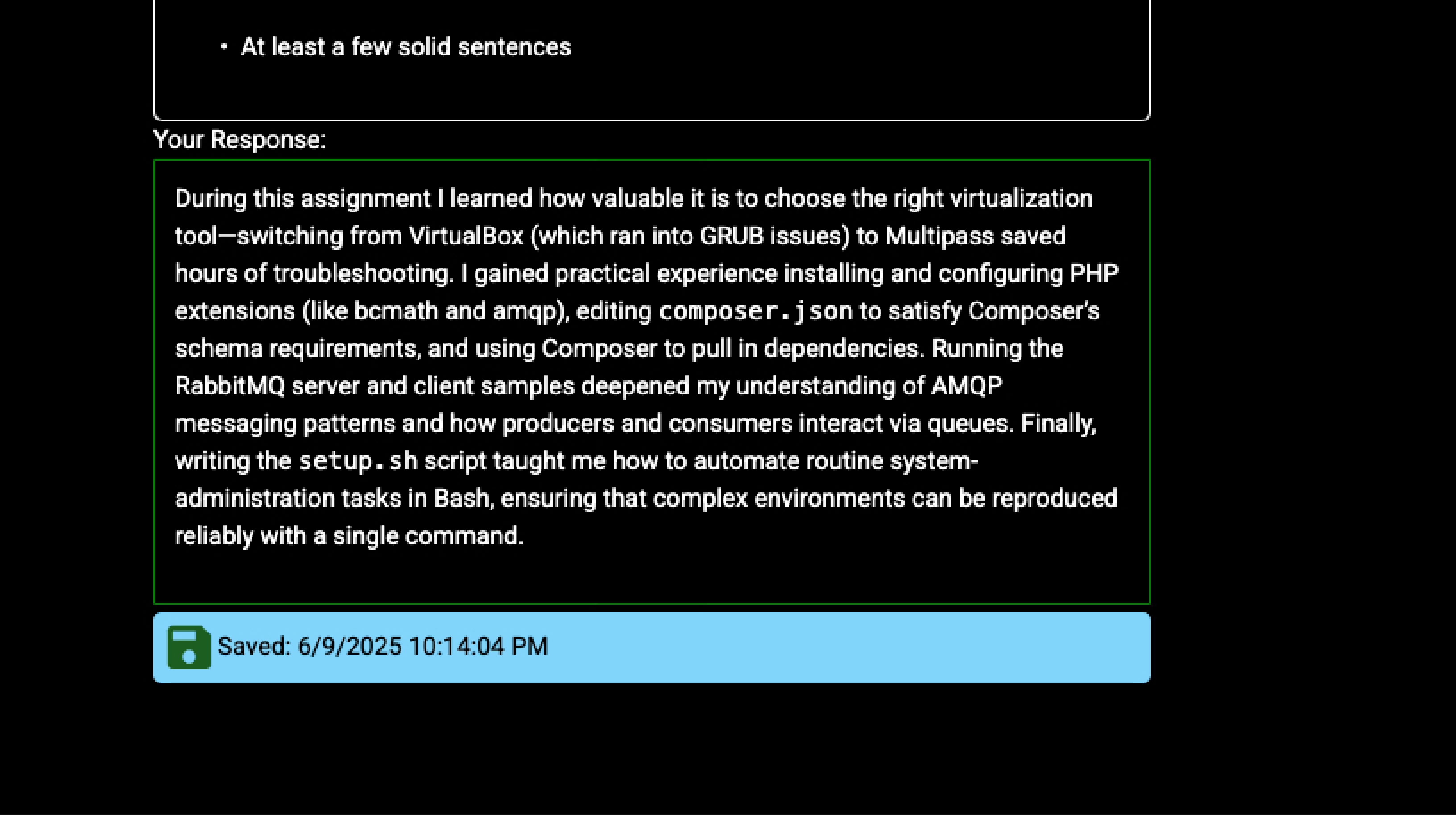
Task #3 (1 pt.) - What did you learn during this assignment

Progress: 100%

Details:



- At least a few solid sentences

Your Response:

During this assignment I learned how valuable it is to choose the right virtualization tool—switching from VirtualBox (which ran into GRUB issues) to Multipass saved hours of troubleshooting. I gained practical experience installing and configuring PHP extensions (like bcmath and amqp), editing `composer.json` to satisfy Composer's schema requirements, and using Composer to pull in dependencies. Running the RabbitMQ server and client samples deepened my understanding of AMQP messaging patterns and how producers and consumers interact via queues. Finally, writing the `setup.sh` script taught me how to automate routine system-administration tasks in Bash, ensuring that complex environments can be reproduced reliably with a single command.

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