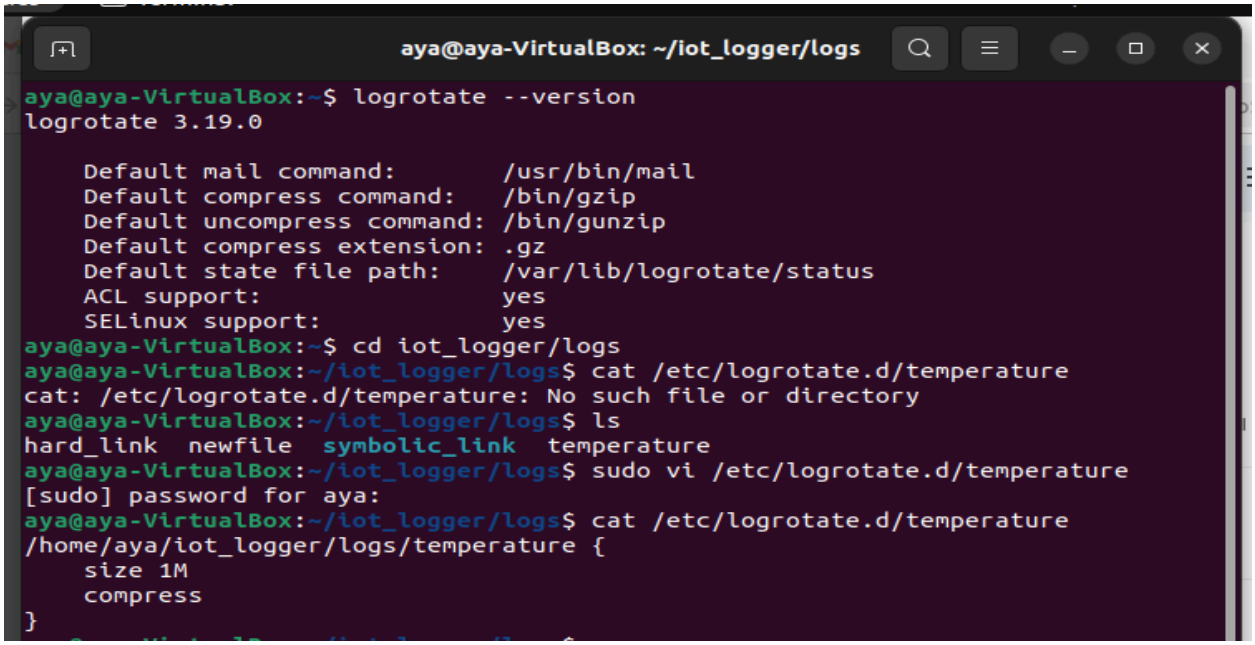
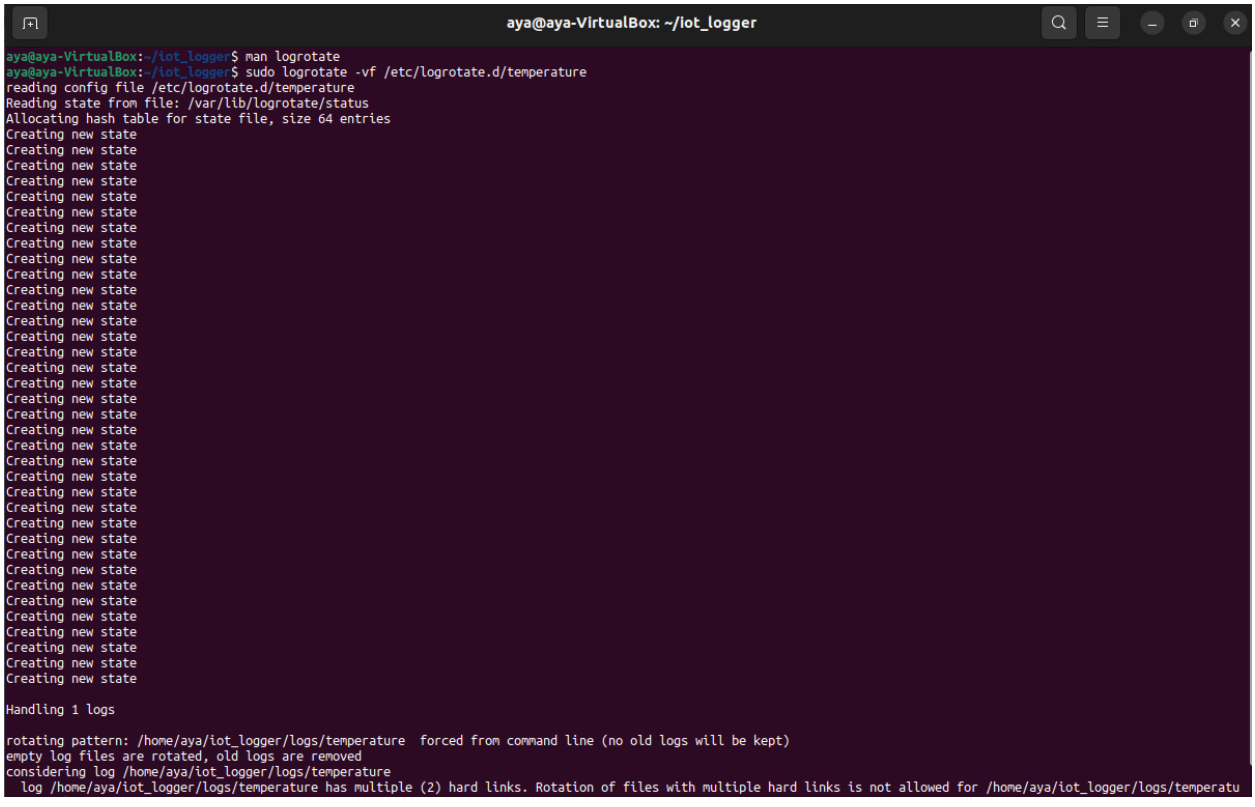
Day 6 – Phase 6: Log Rotation, Scheduling, Archiving

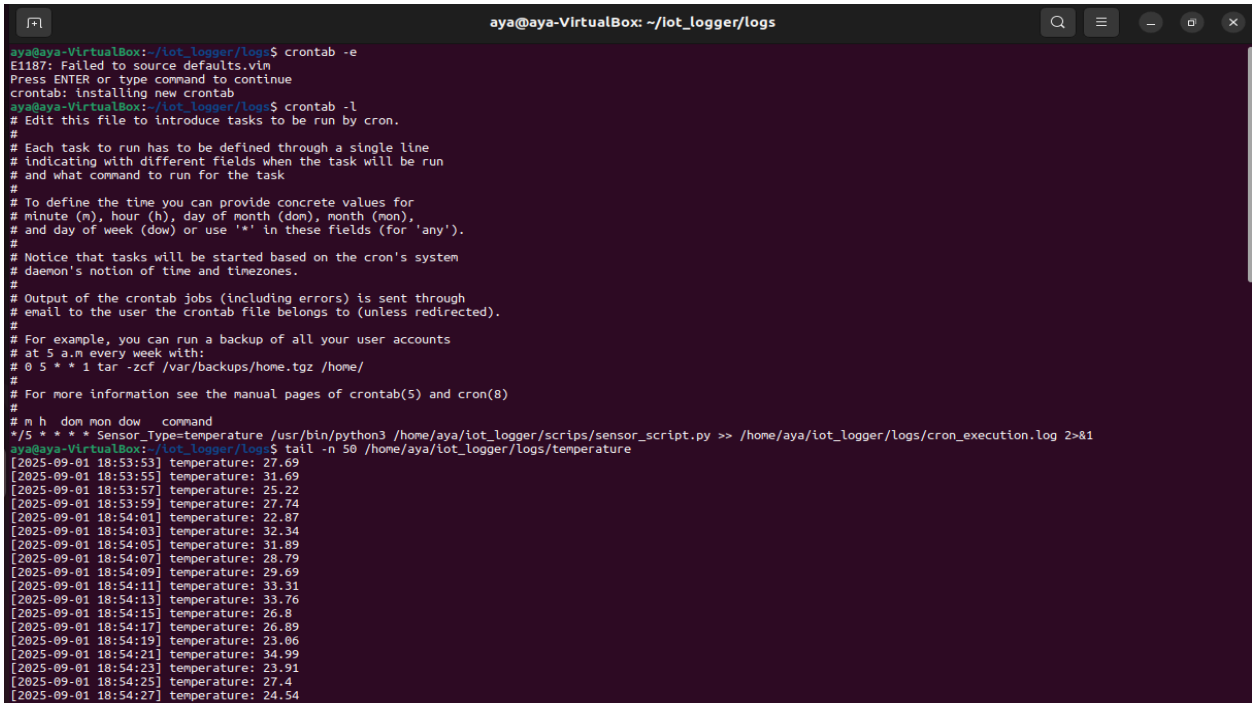
1) log rotation is essential to prevent the sensor readings from growing endlessly (it is handled with logrotate).
https://betterstack.com/community/guides/logging/how-to-manage-log-files-with-logrotate-on-ubuntu-20-04/

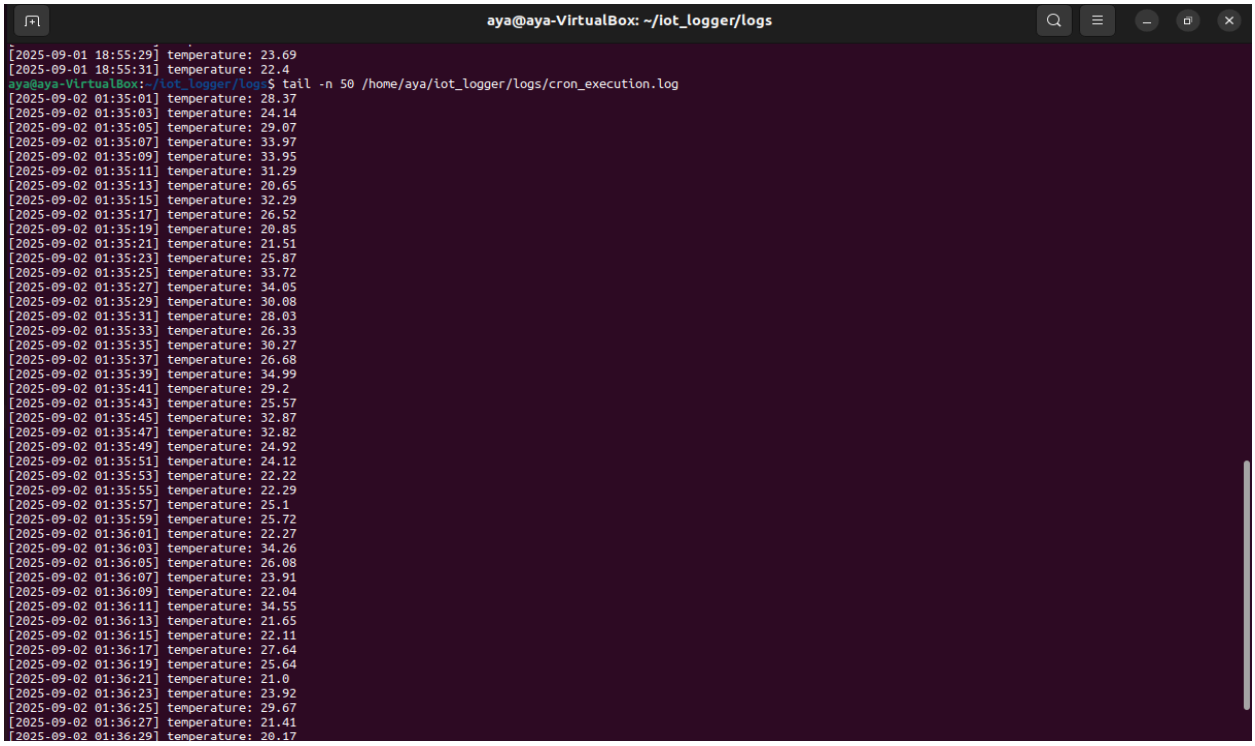


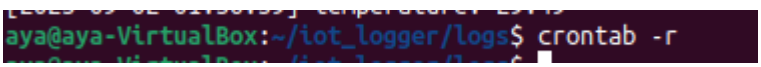
2)



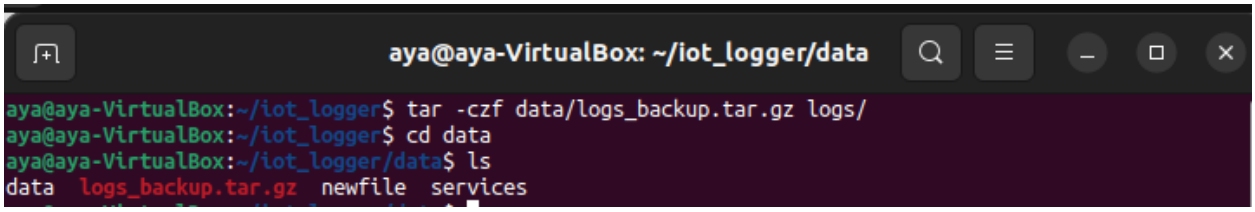
3) & 4) Automating tasks improves efficiency which is done by a cron to run a Python script at regular intervals.
https://medium.com/@zafer_kahraman/automating-your-python-script-execution-with-cron-jobs-7380dc6d8173

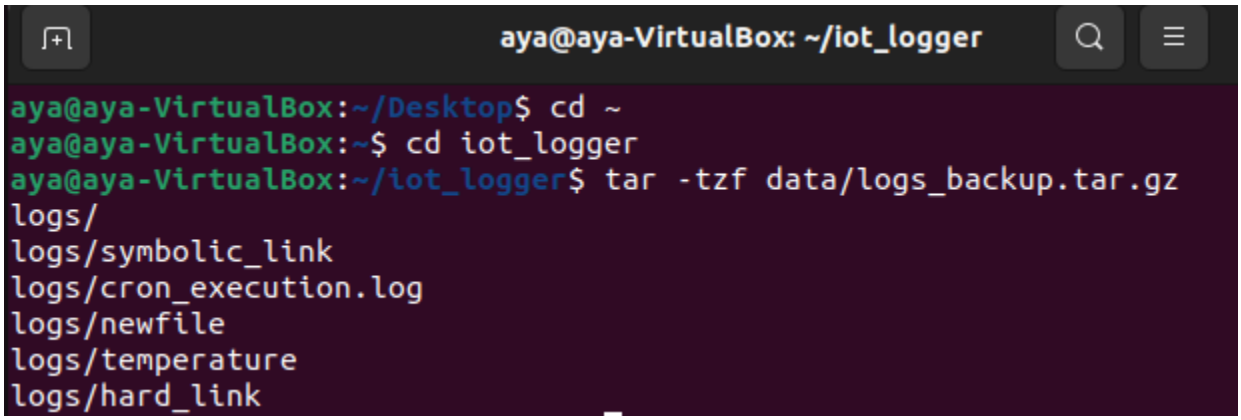




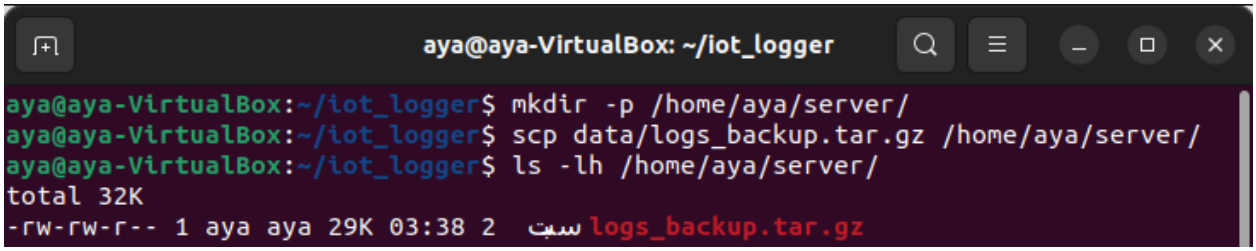
To manually remove the jobs 

5)





6) Use cp → if I only want to simulate moving the archive to another folder on the computer while scp/rsync → if I want to send files to a server.



Open-Ended Questions

1) Cron uses a time-based scheduler in which I define jobs in a crontab file with 5 fields:

```
* * * * * command_to_run
| | | | |
| | | | └── Day of week (0-6, 0=Sunday)
| | | └──── Month (1-12)
| | └────── Day of month (1-31)
| └──────── Hour (0-23)
└────────── Minute (0-59)
```

To run a script every 5 minutes, I added this line to the crontab:

*/5 * * * * /home/aya/iot_logger/myscript.py >> /home/aya/iot_logger/cron.log 2>&1

*/5 → means "every 5 minutes", and * * * → means "every hour, day, month".

Steps to set it up:

Open the crontab for editing: crontab -e

Add the line above and save.

Verify cron jobs: crontab -l

2) The log rotation is needed because without it the logs will grow indefinitely and fill up the disk space, so this keeps the logs manageable in size where the old logs can be archived or deleted automatically.
For example when I logrotate config for temperature.log, I have created a config file:
/etc/logrotate.d/temperature

```
/home/aya/iot_logger/logs/temperature.log {
   size 1M              # Rotate when the log is larger than 1 MB
   compress             # Compress old logs into .gz
}
```

3) The virtual machine has user space and kernel and it runs on top of a hypervisor (e.g., VirtualBox).; however, the container has user space only and uses the kernel of the host operating system (OS) which saves the storage as well as running on top of the host OS kernel. The container does not have to have the same OS as the host where the kernel is the same because they share it, but the userland (binaries, libraries, file system) can be different.

4) Some of the actions combined multiple Linux concepts:
Redirection & Process Monitoring: when running the Python script and redirecting its output to temperature.log while checking log growth with tail -f or ls -lh.
Cron & Logging: cron job runs the Python script every 5 minutes and appends results into a log file which combines the task scheduling with file management.
Archiving & File Management: when I used tar to compress old logs before moving them which combines storage management with backup practices.
This applies to real IoT systems as in IoT the devices generate continuous data where the “Redirection & Logging” is needed to store the sensor readings automatically.
Additionally, the “Cron & Scheduling” is required to collect data at fixed intervals without human intervention and the “Archiving & Cleanup” is used to prevent filling the storage of the small IoT devices.