## UGANDA MARTYRS UNIVERSITY NKOZI

# **AYEBALE JOHN**

## 2023-B071-13424

### SYSTEM ADMINISTRATION

The ICT department at Uganda Martyrs University is implementing a focused automation project to enhance server maintenance and security. Your team is tasked with developing and deploying an automated solution that includes:

- **Backup Automation:** Specifically, backing up the university's "Student Records" directory.
- **System Monitoring:** Monitoring the system's RAM usage and displaying a real-time alert on the screen when usage exceeds a set threshold.
- **Scheduled Logouts:** Automatically logging out any active user sessions at 13:00 hrs daily to allow for system maintenance.

```
ayebale@ubuntuserver:~$ mkdir StudentRecords
ayebale@ubuntuserver:~$ ls -1
Jesus
joseph
Records
Student
StudentRecords
ayebale@ubuntuserver:~$ sudo touch backup.sh
[sudo] password for ayebale:
ayebale@ubuntuserver:~$ ls -1
backup.sh
Jesus
joseph
Records
Student
StudentRecords
ayebale@ubuntuserver:~$
```

#### **Project Objectives**

- 1. Automated Backup for Student Records
  - o Develop a Bash script that archives and backs up the "Student Records" directory.
  - o Use tools like tar to create a compressed archive of the directory.
  - Schedule this backup to run daily at 22:00 hrs via a cron job.

```
ayebale@ubuntuserver:~$ sudo nano backup.sh
ayebale@ubuntuserver:~$ ./backup.sh
./backup.sh: line 5: date+%Y-%m-%d_%H-%M-%S: command not found
tar: Removing leading '/' from member namestar (child):
/home/ayebale/backups/student_records_backup_.tar.gaz: Cannot open: No such file or directory
tar (child): Error is not recoverable: exiting now
tar: /home/ayebale/backups/student_records_backup_.tar.gaz: Cannot write: Broken pipe
tar: Child returned status 2
tar: Error is not recoverable: exiting now
find: missing argument to `-exec'
Backup completed: /home/ayebale/backups/student_records_backup_.tar.gaz
ayebale@ubuntuserver:~$
```

```
ayebale@ubuntuserver:/backups$ sudo rm *
ayebale@ubuntuserver:/backups$ cd
ayebale@ubuntuserver:~$ sudo ./backup.sh
tar: Removing leading `/' from member names
ayebale@ubuntuserver:~$ cd /backups
ayebale@ubuntuserver:/backups$ ls
student_records_backup_2025-04-05.tar.gz
ayebale@ubuntuserver:/backups$ sudo rm *
ayebale@ubuntuserver:/backups$ cd
ayebale@ubuntuserver:/backups$ cd
ayebale@ubuntuserver:~$ sudo ./backup.sh
tar: Removing leading `/' from member names
ayebale@ubuntuserver:~$ cd /backups
ayebale@ubuntuserver:/backups$ ls
student_records_backup_2025-04-05.tar.gz
```

#### 2. RAM Usage Monitoring and Alerts

- Write a script (using Bash or Python) that continuously monitors the system's RAM usage.
- o Set a threshold (e.g., 80% usage) that, when exceeded, triggers an immediate onscreen alert (e.g., using notify-send or a terminal message).
- Ensure the alert clearly indicates the current RAM usage and suggests checking for resource-intensive processes.

```
ayebale@ubuntuserver:"$ ./ram_monitor.sh No such file or directory
ayebale@ubuntuserver:"$ Is
2025-04-05_14-23-43.tan.gaz 2025-04-05_14-30-24.tan.gaz 2025-04-05_14-31-33.tan.gz backups backup.sh Jesus Joseph Records Student StudentRecords
ayebale@ubuntuserver:"$ 12
2025-04-05_14-20-43.tan.gaz 2025-04-05_14-30-24.tan.gaz 2025-04-05_14-31-33.tan.gz backup.sh Jesus Joseph Records Student StudentRecords
ayebale@ubuntuserver:"$ 12
2025-04-05_14-30-34.tan.gaz 2025-04-05_14-31-33.tan.gz backup.sh Joseph Records Student StudentRecords
ayebale@ubuntuserver:"$ ./ram_monitor.sh Student

./ram_monitor.sh: line 17: notify-send: command not found
./ram_monitor
```

```
ayebale@ubuntuserver:/backups$ free -m

total used free shared buff/cache available

Mem: 3916 519 2995 1 627 3396

Swap: 2331 0 2331

ayebale@ubuntuserver:/backups$ ls

ram monitor.sh student records backup 2025-04-05.tar.gz

ayebale@ubuntuserver:/backups$ cd

ayebale@ubuntuserver:-$ sudo nano ram monitor.sh

ayebale@ubuntuserver:-$ sudo nano ram monitor.sh

ayebale@ubuntuserver:-$ sudo ./ram_monitor.sh

sudo:./ram_monitor.sh: command not found

ayebale@ubuntuserver:-$ sudo command not found

ayebale@ubuntuserver:-$ sudo chmod +x ram_monitor.sh

2025-04-05 14-28-43.tar.gaz backups

2025-04-05 14-30-24.tar.gaz backups

ayebale@ubuntuserver:-$ sudo chmod +x ram_monitor.sh

ayebale@ubuntuserver:-$ sudo ./ram_monitor.sh

ayebale@ubuntuserver:-$ stress --vm 2 --vm-bytes 2695M --timeout 30s

stress: info: [2132] successful run completed in 40s

ayebale@ubuntuserver:-$ stress --vm 2 --vm-bytes 2695M --timeout 30s

stress: info: [2212] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2212] successful run completed in 31s

ayebale@ubuntuserver:-$ sudo nano ram_monitor.sh

[sudo] password for ayebale:

ayebale@ubuntuserver:-$ stress --vm 2 --vm-bytes 2695M --timeout 30s

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] successful run completed in 31s

ayebale@ubuntuserver:-$ stress --vm 2 --vm-bytes 2695M --timeout 30s

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2243] dispatching hogs: 0 cpu, 0 io, 2 vm, 0 hdd

stress: info: [2
```

#### 3. Cron Job for Scheduled User Logouts

- o Implement a cron job that runs at 13:00 hrs daily to log out any active user sessions.
- o The script should safely terminate sessions, ensuring any unsaved work is managed or backed up before logout.
- o Include error handling to ensure that system maintenance tasks are performed without data loss or corruption.

```
ubuntuserver login: ayebale
Password:

** Documentation: https://help.ubuntu.com

** Management: https://landscape.canonical.com

** Management: https://landscape.canonical.com

** Support: https://ubuntu.com/pro

System information as of Sat Apr 5 05:39:28 PM UTC 2025

System load:

Usage of /: 47.1% of 11.21GB

Memory usage: 5%
Sump usage: 9%
Processes: 112
Users logged in: 0
IPv4 address for enp0s3: 10.20.3.179
IPv6 address for enp0s3: 2c0f:f6d0:81:203::41ca

Expanded Security Maintenance for Applications is not enabled.

174 updates can be applied immediately.
36 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates.

See https://ubuntu.com/esm or run: sudo pro status

ayebale@ubuntuserver: ** cat /var/log/logout_sessions.log
2025-04-05 17:37:46: Attempting to log out user ayebale
ayebale@ubuntuserver: ** _
```