

MASAABA EVANS HENRY

2023-B291-10205

Youtube url: <https://youtu.be/YDc-ICDTrR0>

AUTOMATED STUDENT RECORDS BACKUP

```
GNU nano 7.2 /home/evanzhenry459/backup/backup_script.sh *
backup_dir="student_records_backup_$(date +%F_%H-%M)"
mkdir -p "/backup/$backup_dir"

cp -r /path/to/Student_Records "/backup/$backup_dir"

tar -czf "/backup/${backup_dir}.tar.gz" "/backup/$backup_dir"

rm -rf "/backup/$backup_dir"

echo "$(date +%F %T) - Backup completed: ${backup_dir}.tar.gz" >> ~/logs/backup_log.txt
```

In the above we create a backup script used to store student records through scripting from the nano environment (nano ~/backup/backup_script.sh) where we;

Create timestamped backup directory.

Copy student records to backup directory.

Compress the backup. Using tar

Clean up uncompressed folder.

Log the backup operation.

And later we make the script executable. Chmod +x ~/backup/backup_script.sh

RAM MONITORING SCRIPT

```
GNU nano 7.2 /home/evanzhenry459/scripts/monitor_ram.sh *

while true; do
    mem_usage=$(free -m | awk '/Mem/{print $3}')
    echo "$(date +%F %T) - $mem_usage MB used" >> ~/logs/memory_log.txt
    sleep 60
done
```

In the above script we make code that helps us with checking for RAM usage of the system every after time and then we make sure that the script is executable by using;

Chmod +x ~/scripts/monitor_ram.sh

This helps prevent system overload once detected early.

SCHEDULED USER LOGOUTS

```
GNU nano 7.2 /home/evanzhenry459/scripts/logout_users.sh *
wall "SYSTEM ALERT: Scheduled logout in 15 minutes. Save your work!"
sleep 900
pkill -KILL -u evanzhenry459
echo "$(date '+%F %T') - All users logged out for maintenance" >> ~/logs/logout_log.txt
```

Through the nano environment we write code above that;

Sends warning to all users that a system maintenance will start in a given time period and when that time reaches a forced log out of all sessions is initiated.

CRON JOBS

```
GNU nano 7.2 /tmp/crontab.3Z4WbZ/crontab *
0 9 * * * /home/evanzhenry459/backup/backup_script.sh
0 13 * * * /home/evanzhenry459/scripts/logout_users.sh
```

A cron job for scheduling log out and backup of records is created such that the scripts run at given periods like in the code above.

Here we use commands like;

Crontab -e to enter the cron editor and crontab -l to check on the cron jobs.

CONCLUSION

```
evanzhenry459@cloudshell:~$ mkdir -p ~/backup ~/scripts ~/logs
evanzhenry459@cloudshell:~$ nano ~/backup/backup_script.sh
evanzhenry459@cloudshell:~$ chmod +x ~/backup/backup_script.sh
evanzhenry459@cloudshell:~$ crontab -e
no crontab for evanzhenry459 - using an empty one
crontab: installing new crontab
evanzhenry459@cloudshell:~$ nano ~/scripts/monitor_ram.sh
evanzhenry459@cloudshell:~$ chmod +x ~/scripts/monitor_ram.sh
evanzhenry459@cloudshell:~$ nohup ~/scripts/monitor_ram.sh > ~/logs/monitor_ram.log 2>&1 &
[1] 1725
evanzhenry459@cloudshell:~$ ps aux | grep monitor_ram.sh
evanzhe+ 1725  0.0  0.0  7344 3712 pts/3    S<   16:26   0:00 /bin/sh /home/evanzhenry459/scripts/monitor_ram.sh
evanzhe+ 1734  0.0  0.0  6684 2304 pts/3    S<+  16:26   0:00 grep --color=auto monitor_ram.sh
evanzhenry459@cloudshell:~$ nano ~/scripts/logout_users.sh
evanzhenry459@cloudshell:~$ chmod +x ~/scripts/logout_users.sh
evanzhenry459@cloudshell:~$ crontab -e
crontab: installing new crontab
evanzhenry459@cloudshell:~$ crontab -l
0 9 * * * /home/evanzhenry459/backup/backup_script.sh

0 13 * * * /home/evanzhenry459/scripts/logout_users.sh
evanzhenry459@cloudshell:~$ ~/backup/backup_script.sh
mkdir: cannot create directory '/backup': Permission denied
cp: cannot stat '/path/to/Student Records': No such file or directory
tar: Removing leading '/' from member namestar (child): /backup/student_records_backup_2025-04-16_16-31.tar.gz: Cannot open
tar: : No such file or directory
tar (child): Error is not recoverable: exiting now
/backup/student_records_backup_2025-04-16_16-31: Cannot stat: No such file or directory
tar: Child returned status 2
tar: Error is not recoverable: exiting now
evanzhenry459@cloudshell:~$ ls -lh ~/backup/
total 4.0K
-rwxrwxr-x 1 evanzhenry459 evanzhenry459 327 Apr 16 16:21 backup_script.sh
evanzhenry459@cloudshell:~$ tail -f ~/logs/memory_log.txt
2025-04-16 16:26:16 - 1656 MB used
2025-04-16 16:27:16 - 1659 MB used
2025-04-16 16:28:16 - 1659 MB used
2025-04-16 16:29:16 - 1661 MB used
2025-04-16 16:30:16 - 1662 MB used
2025-04-16 16:31:16 - 1665 MB used
2025-04-16 16:32:16 - 1666 MB used
2025-04-16 16:33:16 - 1666 MB used
2025-04-16 16:34:16 - 1666 MB used
```

The above is the full automation execution that involves;

Creating the project directories to store the scripts and backups

Mkdir -p ~/backup~/scripts~/logs

Then we check up if scripts were created and also test them

~/backup/backup_script.sh

Ls -lh ~/backup/

Check the monitoring logs

tail -f ~/logs/memory_log.txt

FUTURE ENHANCEMENTS

Encrypt backup files for additional security

Add email notifications for backup status

Implement remote backup storage

Add historical RAM usage tracking

Allow user-specific logout exemptions