

ASSIGNMENT-5

BASH SCRIPTING SUITE FOR SYSTEM MAINTENANCE



Submitted To:

Wipro Technologies

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Objective

To write a suite of Bash scripts to automate system maintenance tasks such as backup, system updates, and log monitoring, and to combine them into one integrated menu-based system.

Software Requirements

Component	Description
OS	Ubuntu (via WSL on Windows 10/11)
Shell	Bash
Tools	Nano, Git
Privileges	Sudo (administrator access)

Project Setup and Environment

1. Installed Ubuntu using WSL:

```
wsl --install
```

2. Updated and upgraded the system:

```
sudo apt update && sudo apt upgrade -y
```

3. Created a project directory:

```
mkdir ~/bash-system-maintenance-suite  
cd ~/bash-system-maintenance-suite
```

Day-wise Work Plan

Day 1: Write a script for automated system backups.

Day 2: Create a script to perform system updates and clean up.

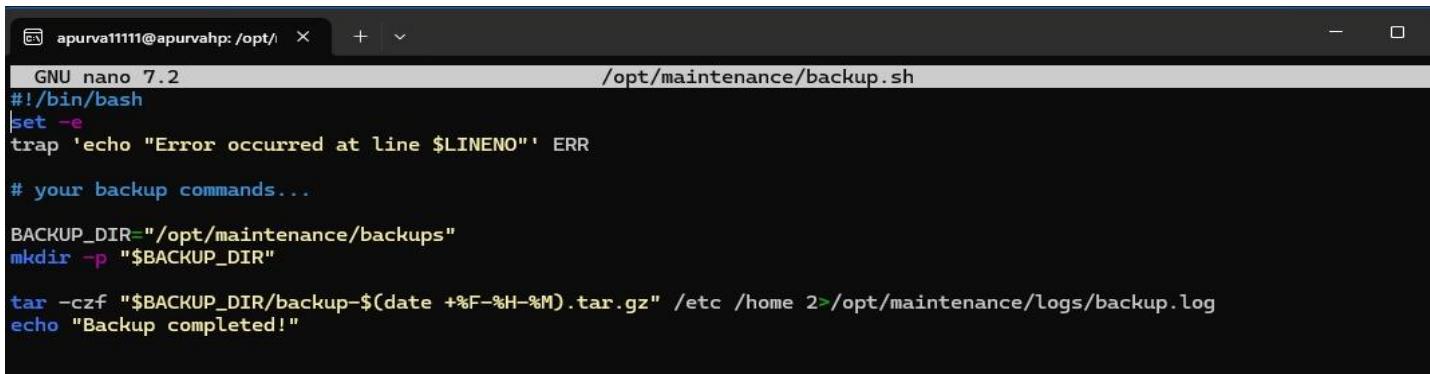
Day 3: Develop a log monitoring script to alert on certain conditions.

Day 4: Combine scripts into a maintenance suite with a menu to execute them.

Day 5: Test scripts and add error handling and logging functionalities.

Code implementation

Day 1 - Backup.sh- Script



The screenshot shows a terminal window with the following content:

```
GNU nano 7.2                                     /opt/maintenance/backup.sh
#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR

# your backup commands...

BACKUP_DIR="/opt/maintenance/backups"
mkdir -p "$BACKUP_DIR"

tar -czf "$BACKUP_DIR/backup-$(date +%F-%H-%M).tar.gz" /etc /home 2>/opt/maintenance/logs/backup.log
echo "Backup completed!"
```

```

#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR

BACKUP_DIR="/opt/maintenance/backups"
mkdir -p "$BACKUP_DIR"
tar -czf "$BACKUP_DIR/backup-$(date +%F-%H-%M).tar.gz" /etc /home
echo "Backup completed successfully!"

```

Day 2 - Update & Cleanup.sh ---Script



The screenshot shows a terminal window titled 'update_clean.sh' containing the following code:

```

GNU nano 7.2
#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR
sudo apt update
sudo apt upgrade -y
sudo apt autoremove -y
sudo apt autoclean -y
echo "System updated and cleaned!"

```

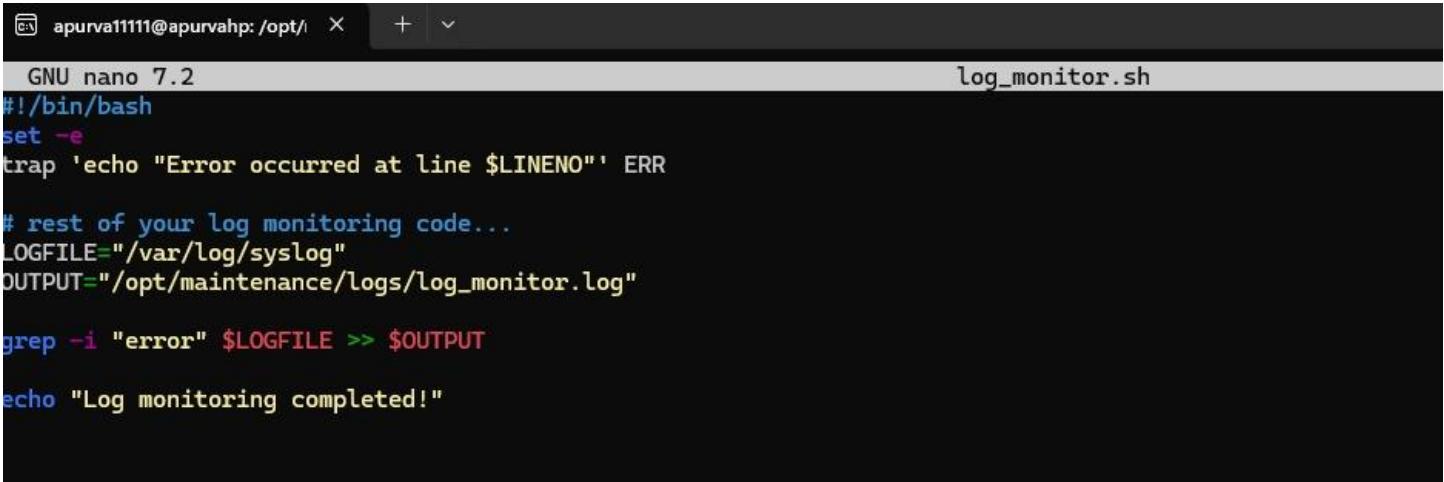
```

#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR

sudo apt update
sudo apt upgrade -y
sudo apt autoremove -y
sudo apt autoclean -y
echo "System updated and cleaned successfully!"

```

Day 3 - Log Monitor.sh-- Script



The screenshot shows a terminal window titled 'log_monitor.sh' containing the following code:

```

GNU nano 7.2
#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR

# rest of your log monitoring code...
LOGFILE="/var/log/syslog"
OUTPUT="/opt/maintenance/logs/log_monitor.log"

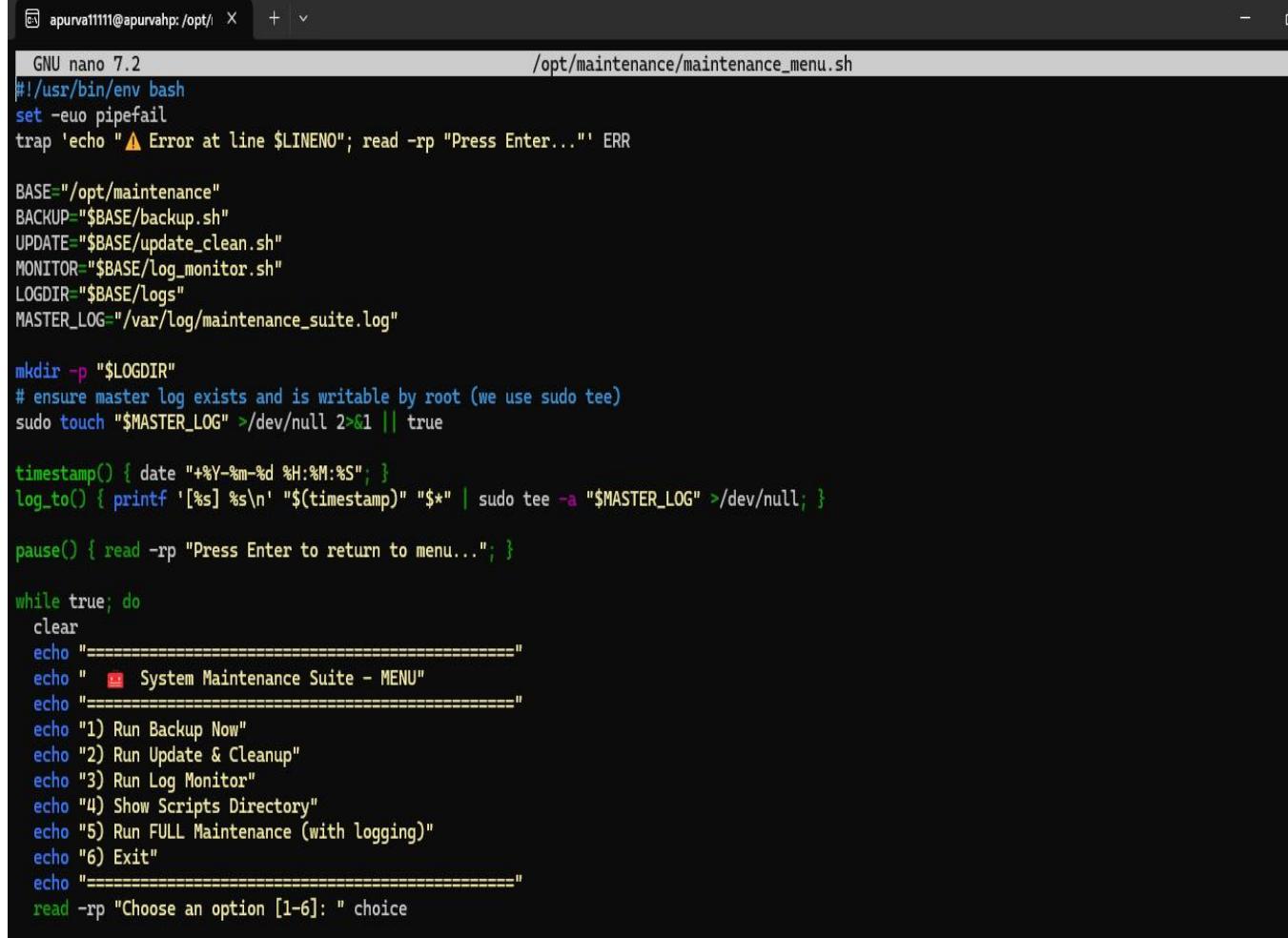
grep -i "error" $LOGFILE >> $OUTPUT
echo "Log monitoring completed!"

```

```
#!/bin/bash
set -e
trap 'echo "Error occurred at line $LINENO"' ERR

LOGFILE="/var/log/syslog"
OUTPUT="/opt/maintenance/logs/log_monitor.log"
grep -i "error" $LOGFILE >> $OUTPUT
echo "Log monitoring completed successfully!"
```

Day 4 - Maintenance Suite---- Menu Script



The screenshot shows a terminal window titled 'apurva1111@apurvahp: /opt/'. The window contains the code for the 'maintenance_menu.sh' script. The code is a bash script that sets variables for script paths and log locations, creates a log directory if it doesn't exist, ensures a master log file exists and is writable by root, and then displays a menu with six options: Run Backup Now, Run Update & Cleanup, Run Log Monitor, Show Scripts Directory, Run FULL Maintenance (with logging), and Exit. The script uses 'read -rp' to prompt the user for a choice and 'sudo tee -a' to append log entries to the master log file.

```
GNU nano 7.2                               /opt/maintenance/maintenance_menu.sh

#!/usr/bin/env bash
set -euo pipefail
trap 'echo "⚠ Error at line $LINENO"; read -rp "Press Enter..."' ERR

BASE="/opt/maintenance"
BACKUP="$BASE/backup.sh"
UPDATE="$BASE/update_clean.sh"
MONITOR="$BASE/log_monitor.sh"
LOGDIR="$BASE/logs"
MASTER_LOG="/var/log/maintenance_suite.log"

mkdir -p "$LOGDIR"
# ensure master log exists and is writable by root (we use sudo tee)
sudo touch "$MASTER_LOG" >/dev/null 2>&1 || true

timestamp() { date "+%Y-%m-%d %H:%M:%S"; }
log_to() { printf '[%s] %s\n' "$(timestamp)" "$*" | sudo tee -a "$MASTER_LOG" >/dev/null; }

pause() { read -rp "Press Enter to return to menu..."; }

while true; do
    clear
    echo =====
    echo "  System Maintenance Suite - MENU"
    echo =====
    echo "1) Run Backup Now"
    echo "2) Run Update & Cleanup"
    echo "3) Run Log Monitor"
    echo "4) Show Scripts Directory"
    echo "5) Run FULL Maintenance (with logging)"
    echo "6) Exit"
    echo =====
    read -rp "Choose an option [1-6]: " choice
```

```

GNU nano 7.2                                         /opt/maintenance/maint
echo "1) Run Backup Now"
echo "2) Run Update & Cleanup"
echo "3) Run Log Monitor"
echo "4) Show Scripts Directory"
echo "5) Run FULL Maintenance (with logging)"
echo "6) Exit"
echo "====="
read -rp "Choose an option [1-6]: " choice

case "$choice" in
  1)
    echo "-> Running backup..."
    log_to "Starting backup"
    sudo "$BACKUP" && log_to "Backup completed"
    pause
  ;;
  2)
    echo "-> Running update & cleanup..."
    log_to "Starting update & cleanup"
    sudo "$UPDATE" && log_to "Update & cleanup completed"
    pause
  ;;
  3)
    echo "-> Running log monitor..."
    log_to "Starting log monitor"
    sudo "$MONITOR" && log_to "Log monitor completed"
    echo "Monitor output (tail):"
    tail -n 20 "$LOGDIR"/log_monitor.log 2>/dev/null || true
    pause
  ;;
  4)
    echo "-> Listing $BASE"
    ls -l "$BASE"
  ;;
  *)
    echo "Help"
    echo "Write Out"
    echo "Where Is"
    echo "Cut"
    echo "Exit"
    echo "Read File"
    echo "Replace"
    echo "Paste"
    echo "Execute"
    echo "Justify"
  ;;
esac

```

```

GNU nano 7.2                                         /opt/maintenance/maintenance_menu.sh
pause
;;
4)
echo "-> Listing $BASE"
ls -l "$BASE"
echo
echo "Logs:"
ls -l "$LOGDIR" 2>/dev/null || true
echo
echo "Master log: $MASTER_LOG"
sudo tail -n 20 "$MASTER_LOG" 2>/dev/null || true
pause
;;
5)
echo "-> Running FULL maintenance (1>2>3)..."
log_to "===== FULL RUN started ====="
echo "Step 1/3: Backup"; sudo "$BACKUP" && log_to "Step 1 OK: Backup"
echo "Step 2/3: Update/Cleanup"; sudo "$UPDATE" && log_to "Step 2 OK: Update/Cleanup"
echo "Step 3/3: Log Monitor"; sudo "$MONITOR" && log_to "Step 3 OK: Log Monitor"
log_to "===== FULL RUN finished ====="
echo "Full run completed."
pause
;;
6)
echo "Exiting. Bye! 🌟"
exit 0
;;
*)
echo "Invalid option. Try again."
sleep 1
;;
esac
done

```

```

#!/bin/bash
set -euo pipefail
trap 'echo "Error occurred at line $LINENO"' ERR

```

```

BASE="/opt/maintenance"
BACKUP="$BASE/backup.sh"
UPDATE="$BASE/update_clean.sh"
MONITOR="$BASE/log_monitor.sh"
LOGDIR="$BASE/logs"
BACKUPDIR="$BASE/backups"
MASTERLOG="$LOGDIR/master_log.txt"

```

```
mkdir -p "$LOGDIR" "$BACKUPDIR"

while true; do
    clear
    echo "=====
    echo "  System Maintenance Suite - MENU"
    echo "=====
    echo "1) Run Backup Now"
    echo "2) Run Update & Cleanup"
    echo "3) Run Log Monitor"
    echo "4) Show Scripts Directory"
    echo "5) Run FULL Maintenance (with logging)"
    echo "6) Exit"
    echo "=====
    read -p "Choose an option [1-6]: " choice

    case $choice in
        1)
            sudo "$BACKUP"
            ;;
        2)
            sudo "$UPDATE"
            ;;
        3)
            sudo "$MONITOR"
            ;;
        4)
            ls -l "$BASE"
            ;;
        5)
            {
                echo "---- $(date) ----"
                "$BACKUP"
                "$UPDATE"
                "$MONITOR"
                echo "Full maintenance completed"
            } | tee -a "$MASTERLOG"
            ;;
        6)
            echo "Exiting. Bye!"
            exit 0
            ;;
        *)
            echo "Invalid choice, please try again."
            ;;
    esac
    read -p "Press Enter to return to the menu..."
```

done

Output and Screenshots:

```
=====  
 System Maintenance Suite - MENU  
=====  
1) Run Backup Now  
2) Run Update & Cleanup  
3) Run Log Monitor  
4) Show Scripts Directory  
5) Run FULL Maintenance (with logging)  
6) Exit  
=====  
Choose an option [1-6]: |
```

backup

```
apurva1111@apurvahp: /opt/ | + | ~  
=====  
 System Maintenance Suite - MENU  
=====  
1) Run Backup Now  
2) Run Update & Cleanup  
3) Run Log Monitor  
4) Show Scripts Directory  
5) Run FULL Maintenance (with logging)  
6) Exit  
=====  
Choose an option [1-6]: 1  
→ Running backup...  
Backup completed!  
Press Enter to return to menu...|
```

Update and cleanup

```
apurva1111@apurvahp: /opt/ | + | ~  
=====  
 System Maintenance Suite - MENU  
=====  
1) Run Backup Now  
2) Run Update & Cleanup  
3) Run Log Monitor  
4) Show Scripts Directory  
5) Run FULL Maintenance (with logging)  
6) Exit  
=====  
Choose an option [1-6]: 2  
→ Running update & cleanup...  
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease  
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease  
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease  
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
All packages are up to date.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Calculating upgrade... Done  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
System updated and cleaned!  
Press Enter to return to menu...|
```

Log monitor

```
apurva1111@apurvahp:~/opt/ | + | x
System Maintenance Suite - MENU
=====
1) Run Backup Now
2) Run Update & Cleanup
3) Run Log Monitor
4) Show Scripts Directory
5) Run FULL Maintenance (with logging)
6) Exit
=====
Choose an option [1-6]: 3
→ Running log monitor...
Log monitoring completed!
Monitor output (tail):
2025-11-07T20:20:44.863671+00:00 apurva1hp wsl-pro-service[2335]: #033[33mWARNING#033[0m Could not ensure valid Landscape configuration: could not ensure valid Landscape configuration: could not register distro to Landscape: could not enable Landscape: /usr/bin/Landscape-config: error: exit status 2.
2025-11-07T20:20:44.863958+00:00 apurva1hp wsl-pro-service[2335]: landscape-config: error: no such option: --register-if-needed
2025-11-07T20:31:45.613975+00:00 apurva1hp wsl-pro-service[2335]: #033[33mWARNING#033[0m Exiting after could not ensure valid Landscape configuration: could not register distro to Landscape: could not enable Landscape: /usr/bin/Landscape-config: error: exit status 2.
2025-11-07T20:31:45.615098+00:00 apurva1hp wsl-pro-service[2335]: landscape-config: error: no such option: --register-if-needed
2025-11-07T21:31:09.378961+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-07T21:38:38.764524+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-07T21:38:38.764524+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T03:04:59.776278+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T06:45:02.125046+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T06:45:02.125046+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T14:16:56.375706+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T15:00:38.358100+00:00 apurva1hp kernel: message repeated 4 times: [ WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5]
2025-11-08T15:00:38.383860+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -3
2025-11-08T15:00:40.390204+00:00 apurva1hp kernel: WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5
2025-11-08T16:07:38.566483+00:00 apurva1hp kernel: message repeated 3 times: [ WSL (218) ERROR: CheckConnection: getaddrinfo() failed: -5]
2025-11-08T16:17:16.161811+00:00 apurva1hp systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file watch ) was skipped because of an unmet condition check (ConditionPathExists=/var/lib/apport'autoreport).
2025-11-08T16:17:16.161815+00:00 apurva1hp systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (timer bas ed) was skipped because of an unmet condition check (ConditionPathExists=/var/lib/apport'autoreport).
2025-11-08T16:31:03.473216+00:00 apurva1hp systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file watch ) was skipped because of an unmet condition check (ConditionPathExists=/var/lib/apport'autoreport).
```

Script directory

```
apurva1111@apurvahp:~/opt/ | + | x
4) Show Scripts Directory
5) Run FULL Maintenance (with logging)
6) Exit
=====
Choose an option [1-6]: 4
→ Listing /opt/maintenance
total 24
-rwxr-xr-x 1 apurva1111 apurva1111 284 Nov  7 21:36 backup.sh
drwxr-xr-x 2 root      root      4096 Nov  8 17:19 backups
-rwxr-xr-x 1 apurva1111 apurva1111 251 Nov  7 21:35 log_monitor.sh
drwxr-xr-x 2 apurva1111 apurva1111 4096 Nov  8 16:56 logs
-rwxr-xr-x 1 apurva1111 apurva1111 2580 Nov  8 17:13 maintenance_menu.sh
-rwxr-xr-x 1 apurva1111 apurva1111 184 Nov  7 21:33 update_clean.sh

Logs:
total 80
-rw-r--r-- 1 root root    93 Nov  8 17:19 backup.log
-rw-r--r-- 1 root root 62612 Nov  8 17:19 log_monitor.log
-rw-r--r-- 1 root root    92 Nov  8 16:54 maintenance_menu2025-11-0816-54-41.log
-rw-r--r-- 1 root root    92 Nov  8 16:56 maintenance_menu2025-11-0816-56-35.log

Master log: /var/log/maintenance_suite.log
[2025-11-08 17:17:49] Starting backup
[2025-11-08 17:17:49] Backup completed
[2025-11-08 17:17:57] Starting backup
[2025-11-08 17:17:57] Backup completed
[2025-11-08 17:18:06] Starting backup
[2025-11-08 17:18:06] Backup completed
[2025-11-08 17:18:17] Starting backup
[2025-11-08 17:18:17] Backup completed
[2025-11-08 17:18:22] Starting update & cleanup
[2025-11-08 17:18:27] Update & cleanup completed
[2025-11-08 17:19:19] Starting backup
[2025-11-08 17:19:19] Backup completed
[2025-11-08 17:19:54] Starting log monitor
[2025-11-08 17:19:54] Log monitor completed
Press Enter to return to menu...|
```

Maintanence suite

```
1) Show Scripts Directory
2) Run Update & Cleanup
3) Run Log Monitor
4) Show Scripts Directory
5) Run FULL Maintenance (with logging)
6) Exit
=====
Choose an option [1-6]: 5
→ Running FULL maintenance (1→2→3)...
Step 1/3: Backup
Backup completed!
Step 2/3: Update/Cleanup
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
System updated and cleaned!
Step 3/3: Log Monitor
Log monitoring completed!
Full run completed.
Press Enter to return to menu...|
```

```
=====
 System Maintenance Suite - MENU
=====
1) Run Backup Now
2) Run Update & Cleanup
3) Run Log Monitor
4) Show Scripts Directory
5) Run FULL Maintenance (with logging)
6) Exit
=====
Choose an option [1-6]: 6
Exiting. Bye! 🌟
apurval1111@apurvahp:/opt/maintenance$ |
```

[GitHub Repository Link](#)

Key Learnings

- Learned Linux Bash scripting and automation.
- Understood file handling, backup creation, and log analysis in Linux.
- Gained hands-on experience with WSL and system-level scripting.

Conclusion

The project successfully automates essential maintenance tasks such as system backup, updates, and log monitoring using Bash scripting. The integrated menu-driven interface makes the suite efficient, easy to use, and well-organized.