Project Report:

Bash Scripting Suite for System Maintenance

1. Project Title

Bash Scripting Suite for System Maintenance

A Linux-based automation toolkit designed to perform essential maintenance tasks such as system backups, updates, cleanup, and log monitoring using Bash scripts.

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2. Full Project Codes

Below are all the scripts used in this project.

2.1 backup.sh

```
#!/bin/bash

# Automated Backup Script


backup_src="/mnt/e/testfile"
backup_dest="/mnt/e/Assignment5/backups/backup_$(date+%F_%T)"log_file="$HOME/backup_log.txt"


mkdir -p "$backup_dest"

echo "Starting backup at $(date)" >> "$log_file"


if cp -r "$backup_src"/* "$backup_dest"/; then

    echo "Backup successful at $(date)" >> "$log_file"

    echo "Backup completed successfully. Files saved in $backup_dest"
else

    echo "Backup failed at $(date)" >> "$log_file"
```

```bash
    echo "Backup failed!"
fi
```

2.2 log_monitor.sh

```bash
#!/bin/bash
# Log monitoring script

log_file="/var/log/syslog"
error_log="/mnt/e/Assignment5/log_monitors/log_errors_$(date +%F_%T).txt"

echo "Scanning logs for errors..."
grep -i "error" "$log_file" > "$error_log"

if [ -s "$error_log" ]; then
    echo "Errors found! Saved in $error_log"
else
    echo "No errors found in logs."
fi
```

2.3 update_cleanup.sh

```bash
#!/bin/bash
# Script for system update and cleanup

echo "Starting system update..."
sudo apt update && sudo apt upgrade -y

echo "Cleaning up..."
sudo apt autoremove -y && sudo apt autoclean -y

echo "System update and cleanup completed successfully."
```

2.4 maintenance_menu.sh

```bash
#!/bin/bash
# Maintenance Suite Menu

# --- Error Handling & Logging ---
set -e
trap 'echo " Error occurred at line $LINENO. Check maintenance_log.txt for details." | tee -a maintenance_log.txt' ERR
exec > >(tee -a maintenance_log.txt) 2>&1
echo "=== Maintenance Session Started at $(date) ==="

while true; do
    echo "=========================="
    echo "   System Maintenance Menu"
    echo "=========================="
    echo "1. Run Backup"
    echo "2. Update & Clean System"
    echo "3. Monitor Logs"
    echo "4. Exit"
    read -p "Enter your choice: " choice

    case $choice in
        1) ./backup.sh ;;
        2) ./update_clean.sh ;;
        3) ./log_monitor.sh ;;
        4) echo "Exiting..."; exit 0 ;;
        *) echo "Invalid option. Try again!" ;;
    esac
    echo
done
```

```
================ System Maintenance Suite ================

1) Run Backup

2) Perform System Update & Cleanup

3) Start Log Monitor (live)

4) View Script Logs

5) Exit

==========================================================
MENU
 read -rp "Choose an option [1-5]: " opt

 case "$opt" in

  1) backups ;;

  2) update_cleanup ;;

  3) monitor ;;

  4) view_logs ;;

  5) echo "Goodbye!"; exit 0 ;;

  *) echo "Invalid option"; sleep 1 ;;

 esac
done
```
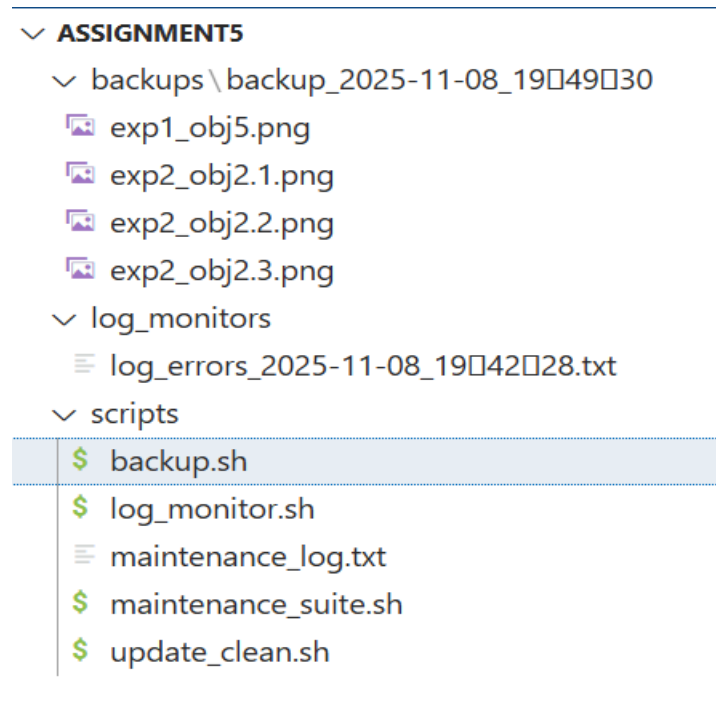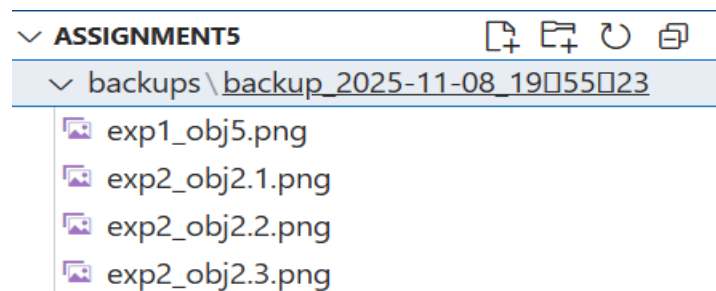
3. SCREENSHOTS

3.1 Project folder structure

```
∨ ASSIGNMENT5
  ∨ backups \ backup_2025-11-08_19□49□30
    🖻 exp1_obj5.png
    🖻 exp2_obj2.1.png
    🖻 exp2_obj2.2.png
    🖻 exp2_obj2.3.png
  ∨ log_monitors
    ≡ log_errors_2025-11-08_19□42□28.txt
  ∨ scripts
    $ backup.sh
    $ log_monitor.sh
    ≡ maintenance_log.txt
    $ maintenance_suite.sh
    $ update_clean.sh
```

3.2 Running backup.sh

```
PS C:\WINDOWS\system32> ubuntu
root@USER:~# cd /mnt/e/Assignment5/scripts
root@USER:/mnt/e/Assignment5/scripts# chmod +x backup.sh update_clean.sh log_monitor.sh maintenance_suite.sh
root@USER:/mnt/e/Assignment5/scripts# ./maintenance_suite.sh
=== Maintenance Session Started at Sat Nov  8 19:54:39 UTC 2025 ===
==============================
   System Maintenance Menu
==============================
1. Run Backup
2. Update & Clean System
3. Monitor Logs
4. Exit
Enter your choice: 1
Backup completed successfully. Files saved in /mnt/e/Assignment5/backups/backup_2025-11-08_19:55:23
```

```
∨ ASSIGNMENT5                    [⊹ [⊹ ↻ ⊟
  ∨ backups \ backup_2025-11-08_19□55□23
    🖻 exp1_obj5.png
    🖻 exp2_obj2.1.png
    🖻 exp2_obj2.2.png
    🖻 exp2_obj2.3.png
```

(The backup file will be stored in this folder)

3.3 Running update_cleanup.sh

```
============================
   System Maintenance Menu
============================
1. Run Backup
2. Update & Clean System
3. Monitor Logs
4. Exit
Enter your choice: 2
Starting system update...
```

```
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 iproute2 amd64 6.1.0-1ubuntu6.2 [1120 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libbsd0 amd64 0.12.1-1build1.1 [41.2 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 netplan-generator amd64 1.1.2-2~ubuntu24.04.2 [61.1 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 python3-netplan amd64 1.1.2-2~ubuntu24.04.2 [24.3 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 ethtool amd64 1:6.7-1build1 [229 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 netplan.io amd64 1.1.2-2~ubuntu24.04.2 [69.7 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libnetplan1 amd64 1.1.2-2~ubuntu24.04.2 [132 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 rsyslog amd64 8.2312.0-3ubuntu9.1 [511 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 systemd-hwe-hwdb all 255.1.6 [3684 B]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 ubuntu-pro-client-l10n amd64 36ubuntu0~24.04 [19.8 kB]
```

3.4 Running log_monitor.sh

```
==============================
1. Run Backup
2. Update & Clean System
3. Monitor Logs
4. Exit
Enter your choice: 3
Scanning logs for errors...
Errors found! Saved in /mnt/e/Assignment5/log_monitors/log_errors_2025-11-08_20:03:44.txt
```

```
log_monitors >  ≡ log_errors_2025-11-08_19⎵42⎵28.txt
 1   2025-06-08T18:30:15.702728+00:00 USER kernel: RAS: Correctable Errors collector initialized.
 2   2025-06-08T18:30:15.703003+00:00 USER kernel: WSL (214) ERROR: CheckConnection: getaddrinfo() failed: -5
 3   2025-06-08T18:30:15.703172+00:00 USER systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file
 4   2025-06-08T18:30:15.703188+00:00 USER systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (time
 5   2025-06-08T18:30:16.145771+00:00 USER snapd[195]: helpers.go:160: error trying to compare the snap system key: system-key missing on disk
 6   2025-06-08T18:30:23.437813+00:00 USER kernel: WSL (2 - init-systemd(Ubuntu)) ERROR: WaitForBootProcess:3487: /sbin/init failed to start wit
 7   2025-06-08T18:32:57.520680+00:00 USER systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file
 8   2025-06-08T18:32:57.520688+00:00 USER systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (time
 9   2025-06-08T18:32:57.521705+00:00 USER kernel: RAS: Correctable Errors collector initialized.
10   2025-06-08T18:33:42.535048+00:00 USER kernel: WSL (211) ERROR: CheckConnection: getaddrinfo() failed: -5
11   2025-06-08T18:34:09.897087+00:00 USER systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file
12   2025-06-08T18:34:09.897094+00:00 USER systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (time
13   2025-06-08T18:35:10.864320+00:00 USER systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file
14   2025-06-08T18:35:10.864327+00:00 USER systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (time
15   2025-06-08T19:34:01.904175+00:00 USER kernel: WSL (211) ERROR: CheckConnection: getaddrinfo() failed: -5
16   2025-11-08T06:28:59.939157+00:00 USER systemd[1]: apport-autoreport.path - Process error reports when automatic reporting is enabled (file
17   2025-11-08T06:28:59.939165+00:00 USER systemd[1]: apport-autoreport.timer - Process error reports when automatic reporting is enabled (time
18   2025-11-08T06:28:59.939925+00:00 USER kernel: RAS: Correctable Errors collector initialized.
19   2025-11-08T06:28:59.940110+00:00 USER kernel: WSL (215) ERROR: CheckConnection: getaddrinfo() failed: -5
20   2025-11-08T06:37:05.506060+00:00 USER apt.systemd.daily[674]: An error occurred: 404  Not Found [IP: 185.125.190.83 80]
```

Saved in logs/script_logs.txt

3.5 maintenance menu interface

```
==============================
   System Maintenance Menu
==============================
1. Run Backup
2. Update & Clean System
3. Monitor Logs
4. Exit
Enter your choice:
```

3.6 Github