Bash Scripting Suite for System Maintenance

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Batch:- 2

Objective:

The purpose of this project is to automate routine system maintenance tasks such as system backup, updates, cleanup, and log monitoring using Bash scripting. The suite is designed to make system administration efficient and error-free by performing repetitive operations automatically.

Environment Used:

- **Operating System:** Ubuntu (WSL on Windows)
- **Shell:** Bash
- **Editor/IDE:** Visual Studio Code
- **Tools Used:** tar, apt, grep, mkdir, touch

List of Scripts:

Script File	Function	Description
Day1.sh	System Backup	Creates compressed system backup of /var/backups directory.
Day2.sh	System Update and Cleanup	Updates packages, removes unused dependencies, and cleans cache.
Day3.sh	Log Monitoring	Scans system logs for error messages and generates an alert file.
Day4.sh	Maintenance Suite Menu	Provides a user menu to choose and execute maintenance scripts interactively.
Day5.sh	Automated Maintenance Log	Automates updates and logs the output into /var/log/maintenance.log.

Day1.sh — System Backup Script

Purpose: This script automates the system backup process by compressing important directories and storing the backup with a timestamp.

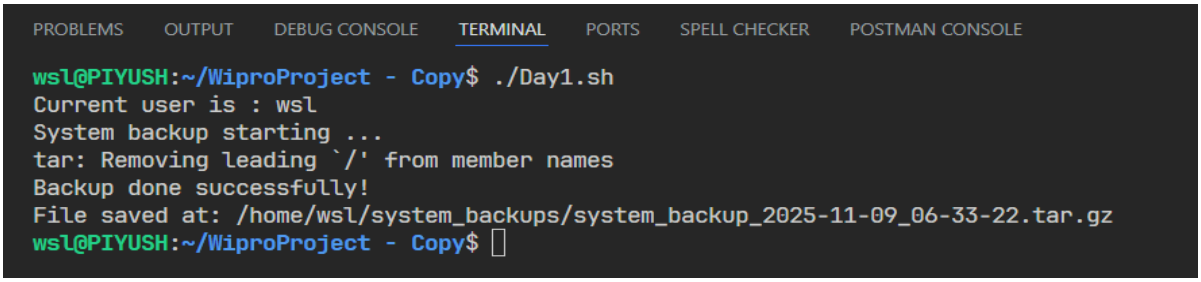
Key Operations:

- Displays the current user.
- Backs up /var/backups directory.
- Stores output in /home/<user>/system_backups/.
- Uses tar command for compression.

Day1 Code Snippet:

```
#!/bin/bash echo "Current
user is : $USER"

source_dir="/var/backups"
dest_dir="/home/$USER/system_backups"  mkdir
-p "$dest_dir"

timestamp=$(date +"%Y-%m-%d_%H-%M-%S")
dest_file="$dest_dir/system_backup_$timestamp.tar.gz"

echo "System backup starting ..." sudo
tar -czf "$dest_file" $source_dir

if [ $? -eq 0 ]; then     echo "Backup
done successfully!"     echo "File
saved at: $dest_file" else     echo
"Backup failed!"
   exit 1
fi
```

Output Screenshot:



Day2.sh — System Update and Cleanup Script

Purpose: Automates the system update, upgrade, and cleanup operations.

Key Operations:

- Updates package lists.
- Installs available upgrades.
- Removes unused dependencies.
- Cleans cached files.

Day 2 Code Snippet:

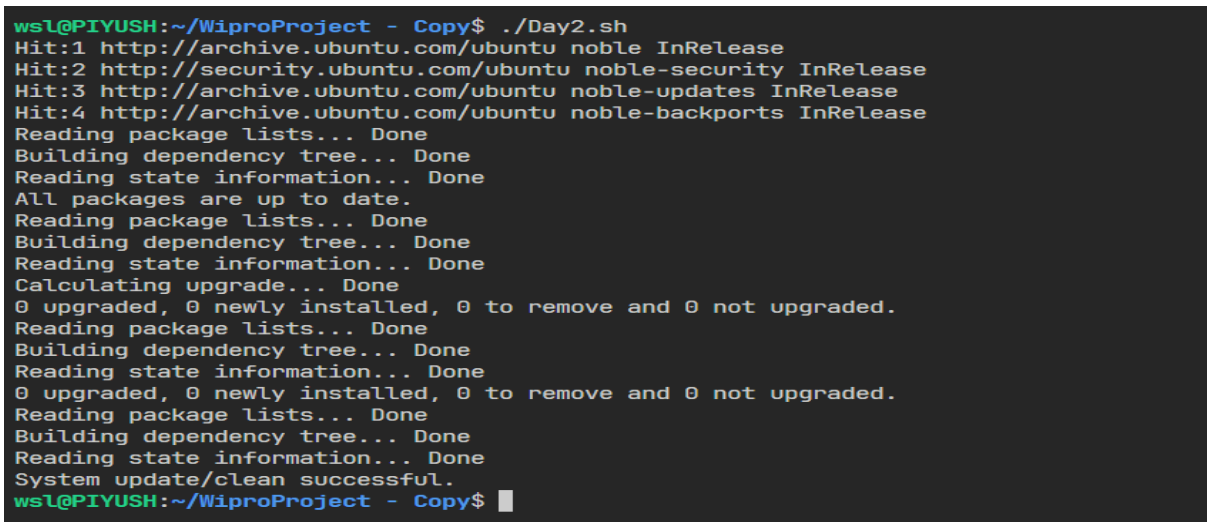
#!/bin/bash sudo apt update -y && sudo

apt upgrade -y sudo apt autoremove -y

sudo apt autoclean -y echo "System

update/clean successful." ***Output***

Screenshot:



Day3.sh — Log Monitoring Script

Purpose: Monitors system logs for error messages and stores them in a separate alert file.

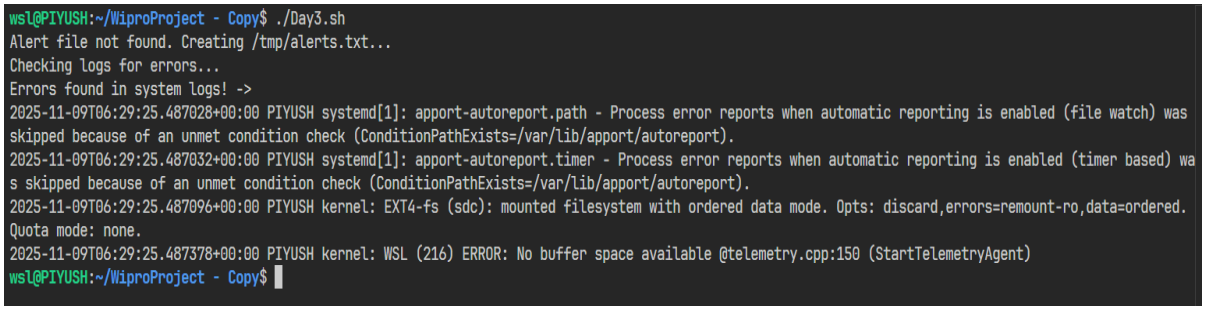
Key Operations:

- Checks if /tmp/alerts.txt exists; creates it if missing.
- Searches /var/log/syslog for “error” entries.
- Displays the detected errors.

Day 3 Code Snippet:

```
#!/bin/bash

LOGS="/var/log/syslog"

ALERT_FILE="/tmp/alerts.txt"


if [ ! -f "$ALERT_FILE" ]; then     echo "Alert file not

found. Creating $ALERT_FILE..."     touch

"$ALERT_FILE"

fi


echo "Checking logs for errors..." grep -i

"error" "$LOGS" > "$ALERT_FILE"


if [ -s "$ALERT_FILE" ]; then     echo

"Errors found in system logs! ->"   cat

"$ALERT_FILE"  else   echo  "No  errors

found."

Fi
```

Output Screenshot:



Day4.sh — Interactive Maintenance Menu

Purpose: Acts as the main controller, providing an interactive menu to run all other scripts from a single interface.

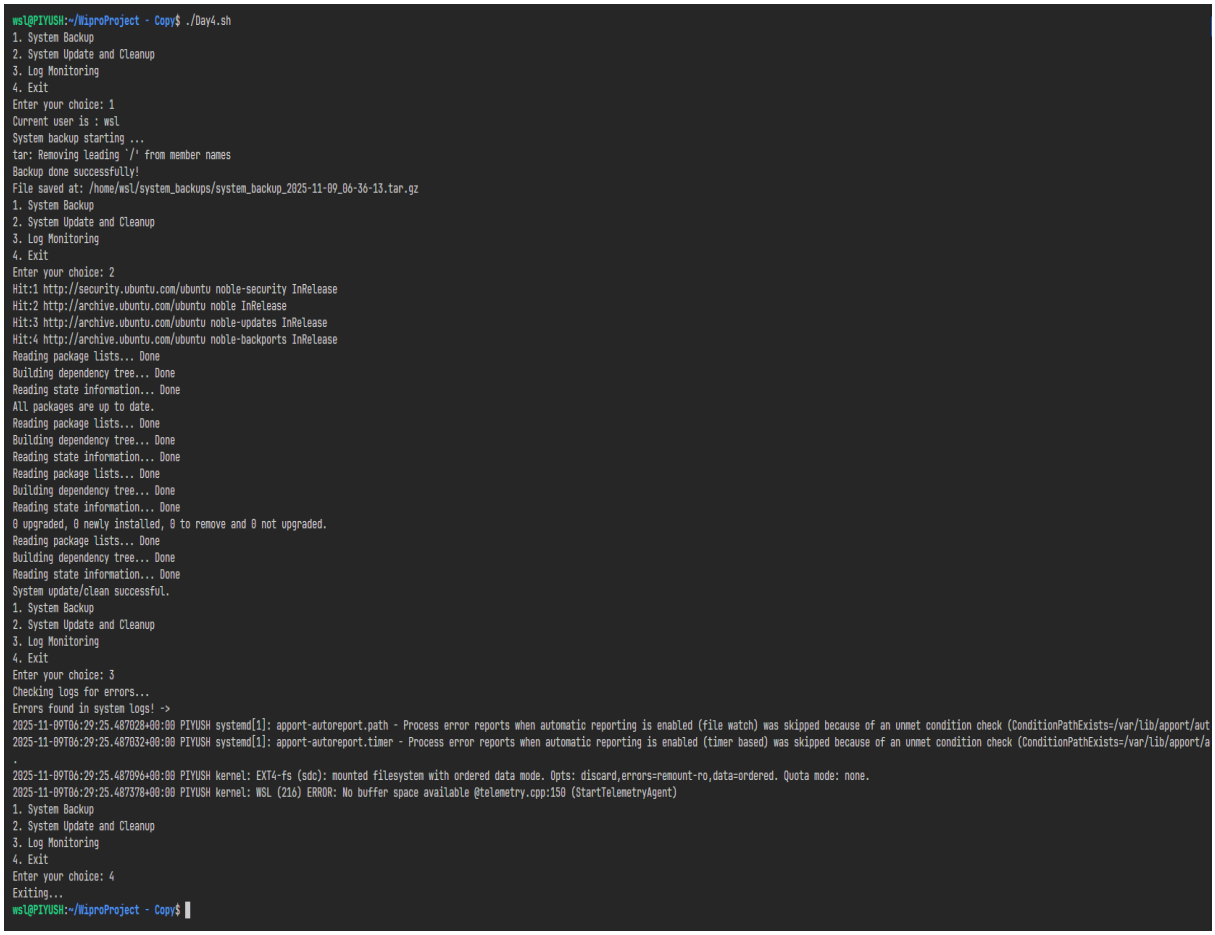
Key Operations:

- Displays a user-friendly menu.
- Calls other scripts (Day1.sh, Day2.sh, Day3.sh) based on user selection.
- Allows graceful exit.

Day 4 Code Snippet:

```
#!/bin/bash while true; do     echo "1.

System Backup"     echo "2. System

Update and Cleanup"     echo "3. Log

Monitoring"     echo "4. Exit"     read -p

"Enter your choice: " num


   case $num in

1) ./Day1.sh ;;

2) ./Day2.sh ;;

3) ./Day3.sh ;;

4) echo "Exiting..."; exit 0 ;;

      *) echo "Invalid choice! Please try again." ;;

esac

done
```

Output Screenshot:



Day5.sh — Automated System Update with Logging

Purpose: Automatically updates the system and logs the maintenance details to /var/log/maintenance.log.

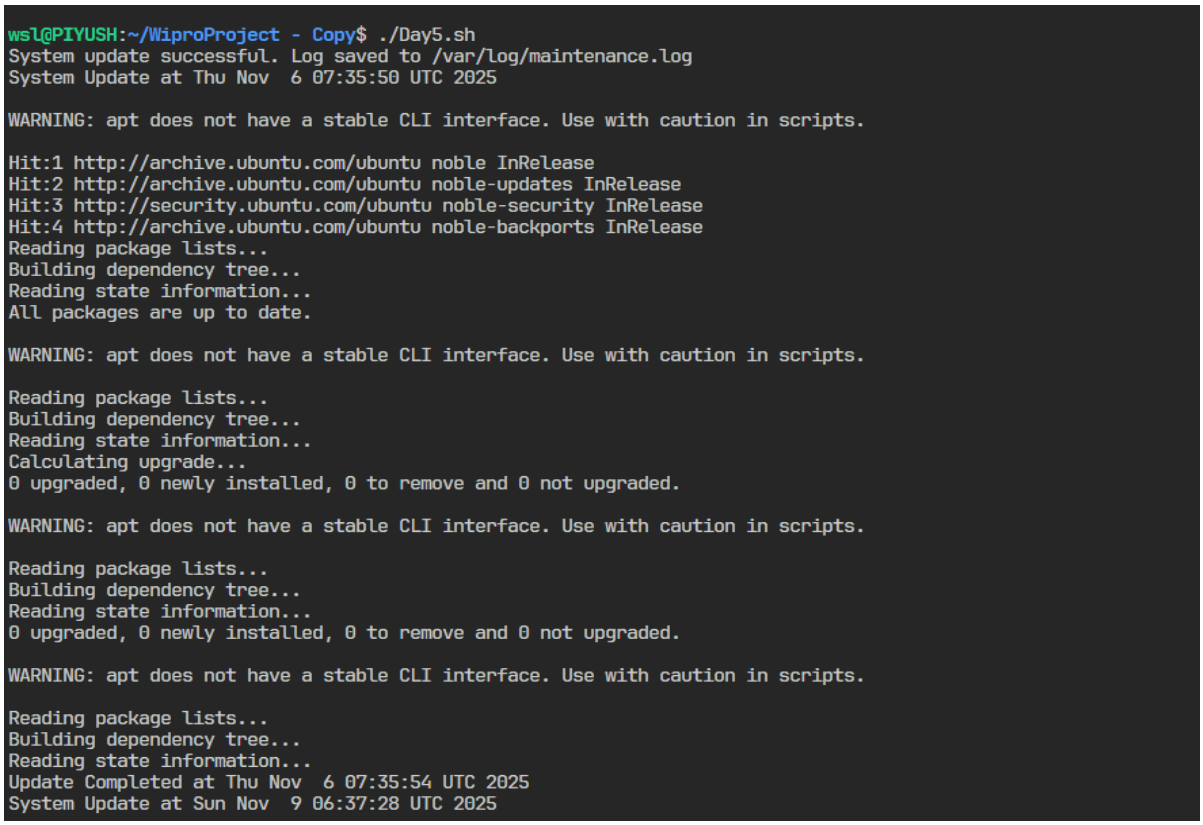
Key Operations:

- Records update start and completion time.
- Redirects both standard output and errors to the log file.
- Displays log contents after execution.

Day 5 Code Snippet:

```
#!/bin/bash

LOGFILE="/var/log/maintenance.log"

{

   echo "System Update at $(date)"

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

sudo apt autoremove -y && sudo apt autoclean -y

echo "Update Completed at $(date)"

} >> "$LOGFILE" 2>&1


if [ $? -eq 0 ]; then     echo "System update successful. Log

saved to $LOGFILE"     cat $LOGFILE else     echo "System

update failed. Check $LOGFILE for details."

fi
```

Output Screenshot:



Project Workflow Summary

Step	Script	Functionality	Result
1	Day1.sh	Backup system files	Success
2	Day2.sh	Update and cleanup system	Success
3	Day3.sh	Monitor logs for errors	Success
4	Day4.sh	Unified control menu	Success
5	Day5.sh	Automated update with logs	Success

Conclusion:

This **Bash Scripting Suite for System Maintenance** effectively automates key system administration tasks — including backups, updates, cleanup, and log monitoring.
The project demonstrates the power of Bash scripting in simplifying Linux system management. Each script is modular, reusable, and easy to extend for additional automation needs.