

# System Maintenance Suite – Automated Backup, Update, and Log Monitoring Tool

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## 1. Objective

The project aims to develop an automated Bash-based maintenance suite capable of performing system backups, updates and cleanup operations, and log scanning for critical issues. It provides a unified command-line menu for simplified system management.

## 2. Codes

### **maint.sh**

```
#!/usr/bin/env bash
set -Eeuo pipefail
banner() { echo -e "\n===== $* =====\n"; }
while true; do
    clear
    echo "System Maintenance Suite"
    echo "1) Run Backup"
    echo "2) Update & Cleanup"
    echo "3) Scan Logs for Issues"
    echo "4) Configure Cron Schedules"
    echo "5) View Logs Directory"
    echo "6) Exit"
    read -rp "Choose an option: " opt
    case "$opt" in
        1) banner "Backup"; ./scripts/backup.sh; read -rp "Press Enter...";;
        2) banner "Update & Cleanup"; ./scripts/update_cleanup.sh; read -rp "Press Enter...";;
        3) banner "Log Monitor"; ./scripts/log_monitor.sh; read -rp "Press Enter...";;
        4) banner "Cron Setup"; echo "Example: 0 2 * * * $(pwd)/scripts/backup.sh"; echo "Open crontab editor now? (y/n)"; read yn; [ "$yn" = "y" ] && crontab -e;;
        5) banner "Logs"; ls -lah logs; read -rp "Press Enter...";;
        6) exit 0;;
        *) echo "Invalid"; sleep 1;;
    esac
done
```

### **backup.sh**

```
#!/usr/bin/env bash
set -euo pipefail
```

```

SRC="${1:-$HOME}"
DEST_DIR="${2:-$(pwd)/backups}"
mkdir -p "$DEST_DIR"
STAMP="$(date +%Y-%m-%d_%H-%M-%S)"
ARCHIVE="$DEST_DIR/backup_${STAMP}.tar.gz"
tar --exclude="$HOME/.cache" --exclude="*/node_modules" -czf "$ARCHIVE" "$SRC"
echo "Backup created: $ARCHIVE"

```

### **update cleanup.sh**

```

#!/usr/bin/env bash
set -euo pipefail
LOG_DIR="$(pwd)/logs"
mkdir -p "$LOG_DIR"
LOG_FILE="$LOG_DIR/update_$(date +%Y-%m-%d_%H-%M-%S).log"
run() { echo "+ $*" | tee -a "$LOG_FILE"; "$@" |& tee -a "$LOG_FILE"; }
if command -v apt >/dev/null 2>&1; then
    PKG="apt"
    run sudo apt update
    run sudo apt -y upgrade
    run sudo apt -y autoremove
    run sudo apt -y autoclean
elif command -v dnf >/dev/null 2>&1; then
    PKG="dnf"
    run sudo dnf -y upgrade --refresh
    run sudo dnf -y autoremove
else
    echo "Unsupported package manager" | tee -a "$LOG_FILE"
    exit 1
fi
echo "Updates complete via $PKG. Log: $LOG_FILE"

```

### **log monitor.sh**

```

#!/usr/bin/env bash
set -euo pipefail
LOG_SRC=""
if [ -f /var/log/syslog ]; then LOG_SRC="/var/log/syslog";
elif [ -f /var/log/messages ]; then LOG_SRC="/var/log/messages";
else echo "No system log found"; exit 1; fi
OUT_DIR="$(pwd)/logs"
mkdir -p "$OUT_DIR"
OUT_FILE="$OUT_DIR/alerts_$(date +%Y-%m-%d').log"

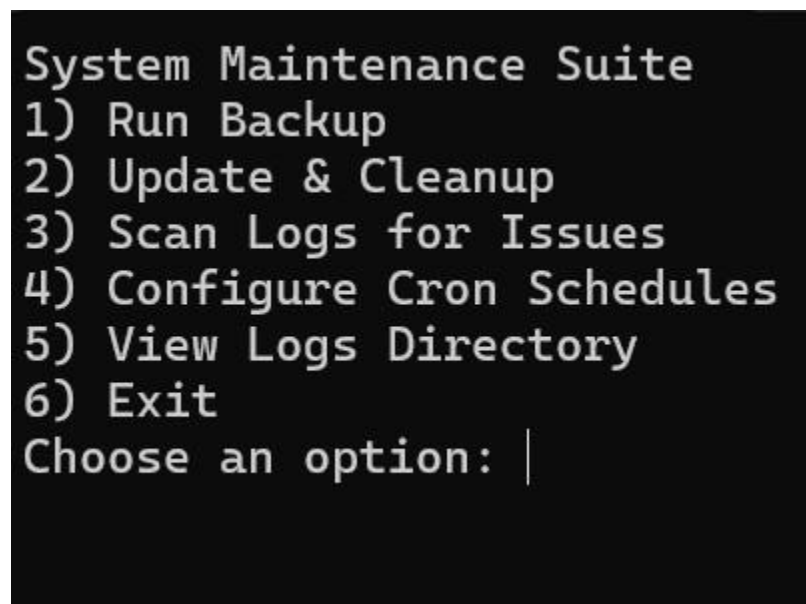
```

```
PATTERN="${1:-'(error|failed|critical|panic)'}"
TAIL_LINES="${2:-500}"
echo "Scanning $LOG_SRC (last $TAIL_LINES lines) for: $PATTERN"
grep -Ei "$PATTERN" <(tail -n "$TAIL_LINES" "$LOG_SRC") | tee -a "$OUT_FILE" || true
echo "Results saved to: $OUT_FILE"
```

### 3. Screenshots

Screenshots based on execution:

#### 1. Main menu interface.

A screenshot of a terminal window showing the main menu of the 'System Maintenance Suite'. The menu is displayed in a monospaced font on a dark background. It lists six numbered options: 1) Run Backup, 2) Update & Cleanup, 3) Scan Logs for Issues, 4) Configure Cron Schedules, 5) View Logs Directory, and 6) Exit. Below the list, the prompt 'Choose an option:' is followed by a vertical cursor bar, indicating that the user is expected to input a choice.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: |
```

## 2. Backup creation message.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: 1

===== Backup =====

tar: Removing leading '/' from member names
Backup created: /home/ayushman/maint-suite/backups/backup_2025-11-09_10-16-55.tar.gz
Press Enter...|
```

## 3. Update and cleanup log creation.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: 5

===== Logs =====

total 12K
drwxr-xr-x 2 ayushman ayushman 4.0K Nov 9 10:22 .
drwxr-xr-x 5 ayushman ayushman 4.0K Nov 9 10:17 ..
-rw-r--r-- 1 ayushman ayushman 0 Nov 9 10:22 alerts_2025-11-09.log
-rw-r--r-- 1 ayushman ayushman 2.1K Nov 9 10:17 update_2025-11-09_10-17-51.log
Press Enter...|
```

## 4. Log monitor output.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: 2

===== Update & Cleanup =====

* sudo apt update

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists...
Building dependency tree...
Reading state information...
All packages are up to date.
* sudo apt --y upgrade

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Reading package lists...
Building dependency tree...
Reading state information...
Calculating upgrade...
The following package was automatically installed and is no longer required:
  liblouis
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
* sudo apt --y autoremove

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Reading package lists...
Building dependency tree...
Reading state information...
The following packages will be REMOVED:
  liblouis
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 129 kB disk space will be freed.
(Reading database ... 80786 files and directories currently installed.)
Removing liblouis:amd64 (1:30.1-1ubuntu1~24.04.2) ...
Processing triggers for libc-bin (2.39-0ubuntu1.6) ...
* sudo apt --y autoremove

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Reading package lists...
Building dependency tree...
Reading state information...
Update complete via apt. Log: /home/ayushman/maint-suite/logs/update_2025-11-09_16-17-51.log
Press Enter...
```

## 5. Cron setup prompt.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: 5

===== Logs =====

total 12K
drwxr-xr-x 2 ayushman ayushman 4.0K Nov  9 10:22 .
drwxr-xr-x 5 ayushman ayushman 4.0K Nov  9 10:17 ..
-rw-r--r-- 1 ayushman ayushman    0 Nov  9 10:22 alerts_2025-11-09.log
-rw-r--r-- 1 ayushman ayushman 2.1K Nov  9 10:17 update_2025-11-09_10-17-51
.log
Press Enter...|
```

## 6. Logs directory listing.

```
System Maintenance Suite
1) Run Backup
2) Update & Cleanup
3) Scan Logs for Issues
4) Configure Cron Schedules
5) View Logs Directory
6) Exit
Choose an option: 4

===== Cron Setup =====

Example: 0 2 * * * /home/ayushman/maint-suite/scripts/backup.sh
Open crontab editor now? (y/n)
|
```

#### 4. Conclusion

The **System Maintenance Suite** project successfully demonstrates how automation can simplify routine system administration tasks using Bash scripting.

It integrates essential maintenance features such as **backup creation, system updates, and log monitoring** into a single unified command-line interface, reducing manual effort and minimizing the risk of system failure due to overlooked maintenance.

Through this project, I gained practical experience in **shell scripting, file management, process automation, and Linux system operations**. The modular script design ensures scalability — new maintenance modules can easily be added in the future.

Overall, the project enhances system reliability, saves time for users, and provides a strong foundation for further development into a **smart automated maintenance assistant**.