Bash Scripting Suite for System Maintenance

Objective: Write a suite of Bash scripts to automate system maintenance tasks such as backup, system updates, and log monitoring.

Day 1: Write a script for automated system backups.

```bash
$ backup.sh > ...
1    #!/bin/bash
2    # Automated Backup Script (Fixed Version)
3
4    # Use $HOME instead of /home
5    SRC="$HOME/Documents"              # Source directory
6    DEST="$HOME/backup"                # Backup directory
7    DATE=$(date +%Y-%m-%d_%H-%M-%S)    # Timestamp
8
9    mkdir -p "$DEST"                   # Create backup folder safely
10   tar -czf "$DEST/backup_$DATE.tar.gz" "$SRC"
11
12   echo "✅ Backup completed successfully at $DATE."
13   echo "📁 Backup saved to: $DEST/backup_$DATE.tar.gz"
14
```

```
sakib@hp MINGW64 ~/OneDrive/Desktop/Capstone_Project
$ bash backup.sh
tar: Removing leading `/' from member names
✅ Backup completed successfully at 2025-11-08_23-08-05.
📁 Backup saved to: /c/Users/sakib/backup/backup_2025-11-08_23-08-05.tar.gz
```

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

```bash
$ update_cleanup.sh
1    #!/bin/bash
2    # System Update and Cleanup (Windows Simulation)
3
4    echo "Simulating system update..."
5    sleep 1
6    echo "System updated successfully!"
7
8    echo "Simulating cleanup..."
9    sleep 1
10   echo "Temporary files cleaned up!"
11
12   echo "✅ Update and cleanup process completed (simulated)."
13
```

```
sakib@hp MINGW64 ~/OneDrive/Desktop/Capstone_Project
$ bash update_cleanup.sh
Simulating system update...
System updated successfully!
Simulating cleanup...
Temporary files cleaned up!
✅ Update and cleanup process completed (simulated).
```

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

```bash
$ log_monitor.sh > ...
 1   #!/bin/bash
 2   # Log Monitoring Script
 3
 4   LOG_FILE="/var/log/syslog"
 5   ALERT_KEYWORD="error"
 6
 7   echo "Monitoring $LOG_FILE for keyword: $ALERT_KEYWORD"
 8
 9   if grep -i "$ALERT_KEYWORD" "$LOG_FILE" > /dev/null
10   then
11     echo "⚠  Alert: '$ALERT_KEYWORD' found in system log!"
12   else
13     echo "✅ No '$ALERT_KEYWORD' found in logs."
14   fi
15
```

```
sakib@hp MINGW64 ~/OneDrive/Desktop/Capstone_Project
$ bash log_monitor.sh
Monitoring /var/log/syslog for keyword: error
grep: /var/log/syslog: No such file or directory
✅ No 'error' found in logs.
```

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

```
$ maintenance_suit.sh
1    #!/bin/bash
2    # Maintenance Suite Menu
3
4    while true; do
5        echo "==============================="
6        echo "   System Maintenance Suite"
7        echo "==============================="
8        echo "1. Backup System"
9        echo "2. Update & Cleanup"
10       echo "3. Monitor Logs"
11       echo "4. Exit"
12       read -p "Choose an option: " choice
13
14       case $choice in
15           1) bash backup.sh ;;
16           2) bash update_cleanup.sh ;;
17           3) bash log_monitor.sh ;;
18           4) echo "Exiting..."; break ;;
19           *) echo "Invalid option, try again." ;;
20       esac
21   done
22
```

```
sakib@hp MINGW64 ~/OneDrive/Desktop/Capstone_Project
$ bash maintenance_suit.sh
===============================
  System Maintenance Suite
===============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 1
tar: Removing leading `/' from member names
✅ Backup completed successfully at 2025-11-08_23-03-23.
📁 Backup saved to: /c/Users/sakib/backup/backup_2025-11-08_23-03-23.tar.gz
===============================
  System Maintenance Suite
===============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 2
Simulating system update...
System updated successfully!
Simulating cleanup...
Temporary files cleaned up!
✅ Update and cleanup process completed (simulated).
===============================
  System Maintenance Suite
===============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 3
Monitoring /var/log/syslog for keyword: error
grep: /var/log/syslog: No such file or directory
✅ No 'error' found in logs.
===============================
  System Maintenance Suite
===============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 4
Exiting...
```

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

```bash
$ maintenance_suit2.sh > ...
1   #!/bin/bash
2   # Enhanced Maintenance Suite with Logging
3
4   LOG_FILE="/home/$USER/maintenance.log"
5
6   log() {
7       echo "$(date '+%Y-%m-%d %H:%M:%S') - $1" >> "$LOG_FILE"
8   }
9
10  while true; do
11      echo "==============================="
12      echo "  System Maintenance Suite"
13      echo "==============================="
14      echo "1. Backup System"
15      echo "2. Update & Cleanup"
16      echo "3. Monitor Logs"
17      echo "4. Exit"
18      read -p "Choose an option: " choice
19
20      case $choice in
21          1) bash backup.sh && log "Backup completed" || log "Backup failed" ;;
22          2) bash update_cleanup.sh && log "System updated" || log "Update failed" ;;
23          3) bash log_monitor.sh && log "Log monitoring run" ;;
24          4) log "Exited suite"; echo "Exiting..."; break ;;
25          *) echo "Invalid option!"; log "Invalid menu selection" ;;
26      esac
27  done
28
```

```
sakib@hp MINGW64 ~/OneDrive/Desktop/Capstone_Project
$ bash maintenance_suit2.sh
==============================
  System Maintenance Suite
==============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 1
tar: Removing leading `/' from member names
✅ Backup completed successfully at 2025-11-08_23-05-54.
📁 Backup saved to: /c/Users/sakib/backup/backup_2025-11-08_23-05-54.tar.gz
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
==============================
  System Maintenance Suite
==============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 2
Simulating system update...
System updated successfully!
Simulating cleanup...
Temporary files cleaned up!
✅ Update and cleanup process completed (simulated).
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
==============================
  System Maintenance Suite
==============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 3
Monitoring /var/log/syslog for keyword: error
grep: /var/log/syslog: No such file or directory
✅ No 'error' found in logs.
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
```

```
==============================
  System Maintenance Suite
==============================
1. Backup System
2. Update & Cleanup
3. Monitor Logs
4. Exit
Choose an option: 4
maintenance_suit2.sh: line 7: /home//maintenance.log: No such file or directory
Exiting...
```