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Subject: Operating System

Paper Code: IT-324

Examination: Mid-Sem

Q. Comprehensive Process Management in Modern Operating Systems.

1. Creating Process
2. Killing Process
3. Scheduling Process
4. changing Process priorities
5. which process is running now
6. Background process



Bash Script

```
# Function to create a process
create_process() {
    echo "Creating a process..."
    sleep 100 & # This creates a dummy process that runs in the background
    echo "Process created with PID: $!"
}

# Function to kill a process
kill_process() {
    echo "Enter the PID of the process to kill:"
    read pid
    kill $pid
    if [ $? -eq 0 ]; then
        echo "Process $pid killed successfully."
    else
        echo "Failed to kill process $pid."
    fi
}

# Function to display process scheduling information
schedule_process() {
    echo "Process scheduling information:"
    ps -eo pid,comm,pri,nice,state,etime --sort=-pri | head -n 10
}

# Function to change process priority
change_priority() {
    echo "Enter the PID of the process to change priority:"
    read pid
    echo "Enter the new priority (-20 to 19, lower is higher priority):"
    read priority
    renice $priority -p $pid
    if [ $? -eq 0 ]; then
        echo "Priority of process $pid changed to $priority."
    else
        echo "Failed to change priority of process $pid."
    fi
}

# Function to display the currently running process
current_process() {
    echo "Currently running processes:"
    ps -eo pid,comm,user,state,%cpu,%mem,etime --sort=-%cpu | head -n 10
}
```



Bash Script

```
# Function to handle background processes
background_process() {
    echo "Background processes:"
    jobs -l
}

# Function to show all information about processes
display_all_info() {
    echo "All process information:"
    ps -eo pid,ppid,comm,user,pri,nice,state,%cpu,%mem,etime,start,time --sort=-%cpu
}

# Menu to perform the actions
while true; do
    echo "\nProcess Management Options:"
    echo "1. Create a process"
    echo "2. Kill a process"
    echo "3. Display process scheduling information"
    echo "4. Change process priority"
    echo "5. Display currently running processes"
    echo "6. Show background processes"
    echo "7. Display all process information"
    echo "8. Exit"
    echo "Choose an option (1-8):"
    read choice

    case $choice in
        1)
            create_process
            ;;
        2)
            kill_process
            ;;
        3)
            schedule_process
            ;;
        4)
            change_priority
            ;;
        5)
            current_process
            ;;
        6)
            background_process
            ;;
        7)
            display_all_info
            ;;
        8)
            echo "Exiting..."
            break
            ;;
        *)
            echo "Invalid option. Please choose again."
            ;;
    esac
done
```



Outputs

```
root@ip-172-31-14-18:/home# ./process_management.sh

Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):1
Creating a process...
Process created with PID: 5784
```

```
Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):2
Enter the PID of the process to kill:5784
Process 5784 killed successfully.
```

```
Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):3
Process scheduling information:
  PID COMMAND      PRI  NI S    ELAPSED
    30 khugepaged      0  19 S    27:58
    29 ksm             14   5 S    27:58
  1024 rtkit-daemon    18   1 S    27:44
     1 systemd        19   0 S    27:58
     2 kthreadd        19   0 S    27:58
     3 pool_workqueue_ 19   0 S    27:58
    13 rcu_tasks_rude_ 19   0 I    27:58
    14 rcu_tasks_trace 19   0 I    27:58
    15 ksoftirqd/0     19   0 S    27:58
```



Outputs

```
Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):4
Enter the PID of the process to change priority:5814
Enter the new priority (-20 to 19, lower is higher priority):10
5814 (process ID) old priority 0, new priority 10
Priority of process 5814 changed to 10.
```

```
Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):6
Background processes:
[1]+  5814 Done                  sleep 100
```

```
Process Management Options:
1. Create a process
2. Kill a process
3. Display process scheduling information
4. Change process priority
5. Display currently running processes
6. Show background processes
7. Display all process information
8. Exit
Choose an option (1-8):5
Currently running processes:
  PID COMMAND          USER      S %CPU %MEM    ELAPSED
  1592 snapd             root      S  0.7  3.3     26:26
  1544 fwupd              root      S  0.1  3.9     26:29
    1 systemd            root      S  0.0  1.4     34:33
 1033 lightdm-gtk-gre lightdm    S  0.0 10.6     34:19
   765 amazon-ssm-agen root      S  0.0  1.9     34:22
   899 Xorg                root      S  0.0  6.8     34:21
   190 systemd-udevd       root      S  0.0  0.8     34:30
   125 systemd-journal    root      S  0.0  1.5     34:31
   516 dbus-daemon          message+ S  0.0  0.6     34:24
```