Operating System - Assignment 3

Jatin Singh Bisht (21105039)

Ques1:


```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem1.sh
echo "Enter the process name:"
read process

# Search for the process using ps aux
pid=$(ps aux | grep -i "$process" | grep -v "grep" | awk '{print $2}')

if [[ -n "$pid" ]]; then
  echo "Process '$process' is running with PID(s): $pid"
else
  echo "Process '$process' is not running."
fi
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem1.sh
Enter the process name:
cmd.exe
Process 'cmd.exe' is running with PID(s): 693
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem1.sh
Enter the process name:
chrome.exe
Process 'chrome.exe' is not running.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ ps -u
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
jbisht     351  0.0  0.1   6072  5408 pts/0    Ss   11:45   0:00 -bash
jbisht     457  0.0  0.1   6072  5252 pts/1    S+   11:45   0:00 -bash
jbisht     692  0.0  0.0   4752  3312 pts/0    S+   12:08   0:00 bash prob
jbisht     693  0.0  0.0   2636  1820 pts/0    S+   12:08   0:00 /init /mn
jbisht     706  0.0  0.1   6072  5408 pts/2    Ss   12:09   0:00 -bash
jbisht     760  0.0  0.1   8280  4244 pts/2    R+   12:13   0:00 ps -u
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem1.sh
Enter the process name:
problem1.sh
Process 'problem1.sh' is running with PID(s): 692
763
766
768
769
```

Ques2:


```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem2.sh
#Program to display disk usage of home directory in human readable format

output=$(du -sh ~)

#Disk usage in tabular format

#Header
echo "-------------------------------"
printf "| %-10s | %-15s |\n" "Size" "Directory"
echo "-------------------------------"

#Body
printf "| %-10s | %-15s |\n" $(echo $output)

echo "-------------------------------"
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem2.sh
-------------------------------
| Size       | Directory       |
-------------------------------
| 28K        | /home/jbisht    |
-------------------------------
```

Ques3:


```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem3.sh
#Fibonacci till N terms

echo "Enter value of N: "
read n
a=0
b=1

echo "Fibonacci series up to $n terms:"
for ((i=0; i<n; i++)); do
  echo -n "$a "
  temp=$((a + b))
  a=$b
  b=$temp
done
echo
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem3.sh
Enter value of N:
5
Fibonacci series up to 5 terms:
0 1 1 2 3
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem3.sh
Enter value of N:
10
Fibonacci series up to 10 terms:
0 1 1 2 3 5 8 13 21 34
```

Ques4:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem4.sh
#Program to search and replace a string in a file

echo "Enter filename:"
read file

# Check if the file exists
if [[ ! -f "$file" ]]; then
  echo "Error: File '$file' does not exist."
  exit 1
fi

echo "Enter string to search:"
read search

# Check if the file contains the search string
if ! grep -q "$search" "$file"; then
  echo "Error: String '$search' not found in '$file'."
  exit 1
fi

echo "Enter replacement string:"
read replace

# Replacing the string
sed -i "s/$search/$replace/g" "$file"

echo "Replacement done successfully."
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat file1.txt
The difference between stupidity and genius is that genius has its limits.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem4.sh
Enter filename:
file1.txt
Enter string to search:
difference
Enter replacement string:
contrast
Replacement done successfully.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat file1.txt
The contrast between stupidity and genius is that genius has its limits.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

Ques5:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem5.sh
#Program to find whether a string or number is a palindrome

echo "Enter a string or number:"
read input

lower_input=$(echo "$input" | tr '[:upper:]' '[:lower:]')

reverse=$(echo "$lower_input" | rev)

if [[ "$lower_input" == "$reverse" ]]; then
  echo "'$input' is a palindrome."
else
  echo "'$input' is not a palindrome."
fi

jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem5.sh
Enter a string or number:
123454321
'123454321' is a palindrome.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem5.sh
Enter a string or number:
Malayalam
'Malayalam' is a palindrome.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ RaceCar
RaceCar: command not found
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem5.sh
Enter a string or number:
RaceCar
'RaceCar' is a palindrome.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem5.sh
Enter a string or number:
apple
'apple' is not a palindrome.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

Ques6:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem6.sh
echo "Enter the filename to monitor:"
read file

# Check if file exists
if [[ ! -f "$file" ]]; then
  echo "Error: File '$file' does not exist."
  exit 1
fi

# Get initial modification timestamp
last_mod=$(stat -c %Y "$file")

echo "Monitoring '$file' for changes..."
while true; do
  new_mod=$(stat -c %Y "$file")
  if [[ "$new_mod" != "$last_mod" ]]; then
    echo "File '$file' has been modified!"
    last_mod=$new_mod  # Update timestamp
  fi
  sleep 1  # Check every second
done
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem6.sh
Enter the filename to monitor:
file1.txt
Monitoring 'file1.txt' for changes...
File 'file1.txt' has been modified!
File 'file1.txt' has been modified!
File 'file1.txt' has been modified!
```

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ echo "hello how are you?" >> file1.txt
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > file1.txt
The difference between stupidity and genius is that genius has its limits.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

Ques7:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem7.sh
#Program to copy numbers from a file and save it to another after sorting

echo "Enter input file name:"
read input_file

# Check if input file exists
if [[ ! -f "$input_file" ]]; then
  echo "Error: File '$input_file' does not exist."
  exit 1
fi

echo "Enter output file name:"
read output_file

# Check if output file already exists
if [[ -f "$output_file" ]]; then
  echo "Warning: File '$output_file' already exists."
  echo "Do you want to overwrite it? (yes/no)"
  read choice
  choice=$(echo "$choice" | tr '[:upper:]' '[:lower:]')

  if [[ "$choice" != "yes" ]]; then
    echo "Operation canceled. The file will not be overwritten."
    exit 0
  fi
fi

# Sort numbers from input file and save them to output file
sort -n "$input_file" > "$output_file"

if [[ $? -eq 0 ]]; then
  echo "Numbers sorted and saved to '$output_file'."
else
  echo "Error: Failed to sort and save the file."
fi
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat fileA.txt
45
12
78
3
89
23
56
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat fileB.txt
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem7.sh
Enter input file name:
fileA.txt
Enter output file name:
fileB.txt
Warning: File 'fileB.txt' already exists.
Do you want to overwrite it? (yes/no)
yes
Numbers sorted and saved to 'fileB.txt'.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat fileB.txt
3
12
23
45
56
78
89
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem7.sh
Enter input file name:
fileA.txt
Enter output file name:
fileB.txt
Warning: File 'fileB.txt' already exists.
Do you want to overwrite it? (yes/no)
no
Operation canceled. The file will not be overwritten.
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

Ques8:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem8.sh
#Program to count files of an extension type in a directory

echo "Enter the directory path:"
read dir

# Check if the directory exists
if [[ ! -d "$dir" ]]; then
  echo "Error: Directory '$dir' does not exist."
  exit 1
fi

echo "Enter the file extension (e.g., txt, sh):"
read ext

count=$(find "$dir" -type f -name "*.$ext" | wc -l)

echo "Number of .$ext files in '$dir': $count"
```

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem8.sh
Enter the directory path:
.
Enter the file extension (e.g., txt, sh):
txt
Number of .txt files in '.': 3
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem8.sh
Enter the directory path:
.
Enter the file extension (e.g., txt, sh):
sh
Number of .sh files in '.': 8
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

Ques9:

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem9.sh
#Program to display system information

# Get system information
os_version=$(lsb_release -d | awk -F"\t" '{print $2}')
kernel_version=$(uname -r)
system_uptime=$(uptime -p)

echo "------------------------------------------"
printf "| %-15s | %-25s |\n" "Parameter" "Value"
echo "------------------------------------------"

printf "| %-15s | %-25s |\n" "OS Version" "$os_version"
printf "| %-15s | %-25s |\n" "Kernel Version" "$kernel_version"
printf "| %-15s | %-25s |\n" "Uptime" "$system_uptime"

echo "------------------------------------------"
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem9.sh
------------------------------------------
| Parameter       | Value                     |
------------------------------------------
| OS Version      | Ubuntu 24.04.1 LTS        |
| Kernel Version  | 5.15.167.4-microsoft-standard-WSL2 |
| Uptime          | up 1 hour, 58 minutes     |
------------------------------------------
```

Ques10:


```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem10.sh
#Multiplication table

echo "Enter a number:"
read num

for ((i=1; i<=10; i++)); do
  echo "$num x $i = $((num * i))"
done
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ bash problem10.sh
Enter a number:
5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
jbisht@JATIN:/mnt/d/operating-sys/Assg3$
```

```
jbisht@JATIN:/mnt/d/operating-sys/Assg3$ cat > problem10.sh
#Multiplication table

echo "Enter a number:"
read num

for ((i=1; i<=10; i++)); do
  echo "$num x $i = $((num * i))"
```