ASSIGNMENT – 2 OPERATING SYSTEM(SHELL)

--KARTIK SHARMA--
MCA-SHIFT 1

1. Basic salary of A is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a script to calculate his gross salary.

```
kart1@kart1-VirtualBox:~$ sh A2_Q1.sh
Enter basic salary:
250000
Gross Salary:  400000.00
kart1@kart1-VirtualBox:~$
```

```
echo "Enter basic salary: "
read basic_sal
da=$(echo "$basic_sal * 0.40" | bc)
hra=$(echo "$basic_sal * 0.20" | bc)
gross_sal=$(echo "$basic_sal + $da + $hra" | bc)
echo "Gross Salary: " $gross_sal
```

2. If a number is input through the keyboard, write a script to calculate the sum of its digits.

```
echo "Enter a number="
read n
sum=0
while [ $n -gt 0 ]
do
digit=$((n % 10))
sum=$((sum + digit))
n=$((n/10))
done
echo "The sum of the digits= $sum"
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q2.sh
Enter a number=
12321
The sum of the digits= 9
kart1@kart1-VirtualBox:~$
```

3. Write a shell script which will receive either filename or the filename with its full path during execution. This script should obtain information about this file by ls -l and display it in proper format.

```
if [ -z "$1" ];
then
echo "Usage: $0 <filename or full path>"
exit 1
fi
file=$1
if [ ! -e "$file" ]; then
echo "File does not exist."
exit 1
fi
echo "Information about file="
ls -l "$file"
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q3.sh A2_Q2.sh
Information about file=
-rw-rw-r-- 1 ayush ayush 158 Nov 11 17:37 A2_Q2.sh
kart1@kart1-VirtualBox:~$ sh A2_Q3.sh A2_Q4.sh
File does not exist.
kart1@kart1-VirtualBox:~$
```

4. If cost price and selling price of an item is input through the keyboard, write a script to determine whether the seller has made profit or incurred loss. Also determine how much profit was made or loss incurred.

```
echo "Enter the cost price:"
read cp
echo "Enter the selling price:"
read sp
if [ $(echo "$sp > $cp" | bc -l) -eq 1 ];
then
profit=$(echo "$sp - $cp" | bc -l)
echo "Profit is made = $profit"
elif [ $(echo "$cp > $sp" | bc -l) -eq 1 ];
then
loss=$(echo "$cp - $sp" | bc -l)
echo "Loss is made = $loss"
else
echo "No profit, no loss."
fi
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q4.sh
Enter the cost price:
2500
Enter the selling price:
1200
Loss is made = 1300
kart1@kart1-VirtualBox:~$ sh A2_Q4.sh
Enter the cost price:
13000
Enter the selling price:
15500
Profit is made = 2500
kart1@kart1-VirtualBox:~$
```

5. Write a script which receives two file names as arguments. It should check whether the contents of the two files are same or not. If they are same then second file should be deleted.

```
cmp -s $1 $2
if [ $? -eq 0 ]
then
rm $2
else
echo The contents of file are not same
fi
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q5.sh A2_Q3 A2_Q4
The contents of file are not same
kart1@kart1-VirtualBox:~$ touch f1
kart1@kart1-VirtualBox:~$ touch f2
kart1@kart1-VirtualBox:~$ ls
A2_Q1.sh  A2_Q4.sh  Desktop    f1      OS        snap
A2_Q2.sh  A2_Q5.sh  Documents  f2      Pictures  Templates
A2_Q3.sh  A2_Q6.sh  Downloads  Music   Public    Videos
kart1@kart1-VirtualBox:~$ sh A2_Q5.sh f1 f2
kart1@kart1-VirtualBox:~$ ls
A2_Q1.sh  A2_Q4.sh  Desktop    f1      Pictures  Templates
A2_Q2.sh  A2_Q5.sh  Documents  Music   Public    Videos
A2_Q3.sh  A2_Q6.sh  Downloads  OS      snap
kart1@kart1-VirtualBox:~$
```

6. Write a script to read the contents from the file

```
echo Enter file name
read fname
terminal='tty'
exec < $fname
while read line
do
echo $line
done
```

```
kart1@kart1 -VirtualBox:~$ sh A2_Q6.sh
Enter file name
A2_Q6.sh
echo Enter file name
read fname
terminal='tty'
exec < $fname
while read line
do
echo $line
done
kart1@kart1 -VirtualBox:~$
```

7. Write a program to calculate overtime pay of 5 employees. Overtime is paid at the rate of Rs.12/hr for every hour worked above 40 hours. Assume that employees do not work for fractional part of an hour.

```
emp=1
while [ $emp -le 5 ]
do
echo Enter working hours
read hours
if [ $hours -gt 40 ]
then
otpay=$(($($hours-40)*12))
echo overtime pay= Rs. $otpay
else
echo No overtime pay
fi
emp=$($($emp+1))
done
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q7.sh
Enter working hours
60
overtime pay= Rs. 240
Enter working hours
55
overtime pay= Rs. 180
Enter working hours
50
overtime pay= Rs. 120
Enter working hours
45
overtime pay= Rs. 60
Enter working hours
40
No overtime pay
kart1@kart1-VirtualBox:~$
```

8. Write a program to find the factorial value of any number entered through the keyboard.

```
echo "Enter a number"
read num
fact=1
i=1
while [ $i -le $num ]
do
fact=$((fact * i))
i=$((i + 1))
done
echo "The factorial of $num is $fact"
```

```
kart1@kart1 -VirtualBox:~$ sh A2_Q8.sh
Enter a number
4
The factorial of 4 is 24
kart1@kart1 -VirtualBox:~$
```

9. The marks obtained by a student in 5 different subjects are input through the keyboard. The student gets a division as per the following rules:

--percentage above or equal to 60 – First Division

--percentage between 50 and 59 –Second Division

--percentage between 40 and 49 – Third Division

--percentage less than 40 – Fail

```
echo Enter marks in five subjects
read m1 m2 m3 m4 m5
per=$(((m1 + m2 + m3 + m4 + m5)/5))
if [ $per -ge 60 -a $per -le 100 ]
then
echo First Division
elif [ $per -ge 50 -a $per -le 59 ]
then
echo Second Division
elif [ $per -ge 40 -a $per -le 49 ]
then
echo Third division
elif [ $per -lt 40 -a $per -ge 0 ]
then
echo Fail
else
echo Invalid Input
fi
```

```
kart1@kart1 -VirtualBox:~$ sh A2_Q9.sh
Enter marks in five subjects
101 101 101 101 101
Invalid Input
kart1@kart1 -VirtualBox:~$ sh A2_Q9.sh
Enter marks in five subjects
58 65 98 63 23
First Division
kart1@kart1 -VirtualBox:~$
```

10. Write a script to receive an adapter name (MA or CGA or VGA or EGA) from the keyboard and then decide and print as per the following rule:

    if MA it is monochrome adapter

    if CGA it is color graphics adapter

    if [$adapter = “CGA”]

    if EGA it is enhanced graphics adapter

    if VGA it is video graphics adapter

```
echo Enter the Adapter name MA/CGA/EGA/VGA/SGA
read adapter
if [ $adapter = "MA" -o $adapter = "ma" ]
then
echo You have Monochrome Adapter
elif [ $adapter = "CGA" ]
then
echo You have Color Graphics Adapter
elif [ $adapter = "EGA" ]
then
echo You have Enhanced Graphics Adapter
elif [ $adapter = "VGA" ]
then
echo You have Video Graphics dAapter
elif [ $adapter = "SGA" ]
then
echo You have Super Graphics Adapter
else
echo Any other adapter
fi
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q10.sh
Enter the Adapter name MA/CGA/EGA/VGA/SGA
MA
You have Monochrome Adapter
kart1@kart1-VirtualBox:~$ sh A2_Q10.sh
Enter the Adapter name MA/CGA/EGA/VGA/SGA
SGA
You have Super Graphics Adapter
kart1@kart1-VirtualBox:~$ sh A2_Q10.sh
Enter the Adapter name MA/CGA/EGA/VGA/SGA
LK
Any other adapter
kart1@kart1-VirtualBox:~$
```

11. Write a script to input a file name and check if file is readable, writable and executable or does not exist.

```
echo Enter any file name
read fname
if [ -e $fname ]
then
if [ -r $fname -a -w $fname -a -x $fname ]
then
echo "You have read, write and execute permissions to $fname"
else
echo "Read, Write, Execute permissions denied"
fi
else
echo "Improper file name"
fi
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q11.sh
Enter any file name
A2_Q11.sh
Read, Write, Execute permissions denied
kart1@kart1-VirtualBox:~$ chmod 777 A2_Q11.sh
kart1@kart1-VirtualBox:~$ sh A2_Q11.sh
Enter any file name
A2_Q11.sh
You have read, write and execute permissions to A2_Q11.sh
kart1@kart1-VirtualBox:~$
```

12. A friend of yours has promised to log in at a particular time. However, he has not kept the promise. You want to contact him as soon as he logs in. Write a shell script which checks after every 1 minute whether your friend has logged in or not. The Logname should be supplied to the shell script at command prompt.

```
echo "Waiting for $1"
while [ 1 ]
do
whoami | grep "$1" > /dev/null
if [ $? -eq 0 ]
then
echo "$1 logged in"
break
fi
sleep 60
done
```

13. Write a menu driven program which has following options:

    1. Content of /etc/passwd
    2. List of users who have currently logged in
    3. Present Working Directory
    4. Exit

```
while true
do
    echo "Menu:"
    echo "1. Content of /etc/passwd"
    echo "2. List of users who have currently logged in"
    echo "3. Present Working Directory"
    echo "4. Exit"
    echo -n "Enter your choice (1-4): "
    read choice

    case $choice in
        1)
            echo "Content of /etc/passwd:"
            cat /etc/passwd
            ;;
        2)
            echo "List of currently logged in users:"
            who
            ;;
        3)
            echo "Present Working Directory:"
            pwd
            ;;
        4)
            echo "Exiting..."
            exit 0
            ;;
        *)
            echo "Invalid choice. Please enter a number between 1 and 4."
            ;;
    esac
    echo ""
done
```

```
kart1@kart1-VirtualBox:~$ sh A2_Q13.sh
Menu:
1. Content of /etc/passwd
2. List of users who have currently logged in
3. Present Working Directory
4. Exit
Enter your choice (1-4): 2
List of currently logged in users:
ayush    seat0        2024-11-11 17:22 (login screen)
ayush    tty2         2024-11-11 17:22 (tty2)

Menu:
1. Content of /etc/passwd
2. List of users who have currently logged in
3. Present Working Directory
4. Exit
Enter your choice (1-4): 3
Present Working Directory:
/home/ayush

Menu:
1. Content of /etc/passwd
2. List of users who have currently logged in
3. Present Working Directory
4. Exit
Enter your choice (1-4): 4
Exiting...
kart1@kart1-VirtualBox:~$
```

14. Write a script to do the following: the output of who should be sorted and displayed on the screen and the same output with the number of users should also be stored on a file “file1”

```
ch=1
while [ $ch -eq 1 ]
do
    clear
    echo "AIM: Menu-driven program"
    tput cup 2 10
    echo "1. Content of /etc/passwd"
    tput cup 3 10
    echo "2. List of users who have currently logged in"
    tput cup 4 10
    echo "3. Present working directory"
    tput cup 5 10
    echo "4. Exit"
    tput cup 6 10
    read -p "Enter your choice: " choice

    case $choice in
        1)
            tput cup 8 10
            read -p "Enter the name of user: " user
            grep "$user" /etc/passwd
            ;;
        2)
            tput cup 8 10
            echo "List of currently logged-in users:"
            who
            ;;
        3)
            tput cup 8 10
            echo "Present working directory is: $(pwd)"
            ;;
        4)
            ch=0
            exit 0
            ;;
        *)
            tput cup 8 10
            echo "Invalid choice"
            ;;
    esac
    echo ""
    tput cup 10 10
    read -p "Do you want to continue? Press 1 for Yes or 0 for No: " ch
done
```

```
AIM: Menu-driven program

          1. Content of /etc/passwd
          2. List of users who have currently logged in
          3. Present working directory
          4. Exit
          Enter your choice: 1

          Enter the name of user: KART1
kartik:x:1000:1000:KART1 :/home/KART1 :/bin/bash
          Do you want to continue? Press 1 for Yes or 0 for No: 1
AIM: Menu-driven program

          1. Content of /etc/passwd
          2. List of users who have currently logged in
          3. Present working directory
          4. Exit
          Enter your choice: 2

          List of currently logged-in users:
KART1     seat0        2024-11-11 17:22 (login screen)
KART1     tDo you want to continue? Press 1 for Yes or 0 for No: 1
AIM: Menu-driven program

          1. Content of /etc/passwd
          2. List of users who have currently logged in
          3. Present working directory
          4. Exit
          Enter your choice: 3

          Present working directory is: /home/KART1

          Do you want to continue? Press 1 for Yes or 0 for No: 2
kart1@kart1-VirtualBox:~$
AIM: Menu-driven program

          1. Content of /etc/passwd
          2. List of users who have currently logged in
          3. Present working directory
          4. Exit
          Enter your choice: 4
kart1@kart1-VirtualBox:~$
```