Laboratory Assignment #No. 3

On

Design of Operating System (CSE 4049)

Submitted by

Name	**: Aman Kumar Singh**
Reg. No.	**: 2141019334**
Semester	**: 5th**
Branch	**: CSE**
Section	**: 2141009 (CSE-I)**
Session	**: 2023-2024**
Admission Batch	**: 2021**

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

FACULTY OF ENGINEERING & TECHNOLOGY (ITER)

SIKSHA 'O' ANUSANDHAN DEEMED TO BE UNIVERSITY

BHUBANESWAR, ODISHA – 751030

Question1: Write a shell script iaop to perform integer arithmetic on two numbers, where the value of the two numbers will be given during runtime.

Code:

```
echo "1st : " $1
echo "2nd : " $2
sum=$(($1+$2))
sub=$(($1-$2))
mul=$(($1*$2))
div=$(($1/$2))
echo "The sum is " $sum
echo "The diff is "$sub
echo "The Product is "$mul
echo "The Div is "$div
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./iaop.sh 12 23
1st :  12
2nd :  23
The sum is  35
The diff is -11
The Product is 276
The Div is 0
```

Question 2: Write a shell script faop to perform floating point arithmetic on two numbers, where the value of the two numbers will be given during runtime.

Code:

```
echo "The First number is : " $1
echo "The Second number is : " $2
sum=$(bc <<< "$1 + $2")
sub=$(bc <<< "$1 - $2")
mul=$(bc <<< "$1 * $2")
div=$(bc <<< "scale=7; $1 / $2")
echo "The sum is " $sum
echo "The diff is "$sub
echo "The Product is "$mul
echo "The Div is "$div
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./faop.sh 11.0 3
The First number is :  11.0
The Second number is :  33.0
The sum is  44.0
The diff is -22.0
The Product is 363.0
The Div is .3333333
```

Question 3: . Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to calculate his gross salary.

Code:

```
1 echo "Ramesh's Basic Salary is : " $1
2 dearanceAllowance=$(bc <<< "0.4 * $1")
3 rentAllowance=$(bc <<< "0.2 * $1")
4 grossSalary=$(bc <<< "$1 + $dearanceAllowance + $rentAllowance")
5 echo "Ramesh's Gross Salary is : " $grossSalary
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./ass3q3.sh 12000
Ramesh's Basic Salary is :  12000
Ramesh's Gross Salary is :  19200.0
```

Question 4: If a five digit number is input given through the keyboard during runtime, write a program to calculate the sum of its digits.

Code:

```
1 echo "The number you entered is : " $1
2 m=$1
3 sum=0
4 if [ "$1" -ge 10000 ] && [ "$1" -le 99999 ];then
5         echo "It is a five digit number. "
6         while [ "$m" -gt 0 ];
7         do
8         r=$(($m % 10))
9         sum=$((sum+r))
10        m=$((m/10))
11        done
12 else
13        echo "It is not a five digit number. "
14 fi
15 echo "The sum of digits is : "$sum
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./ass3q4.sh 45241
The number you entered is :  45241
It is a five digit number.
The sum of digits is : 16
```

Question 5: If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit was made or loss incurred.

Code:

```
echo "Enter the cost price:"
read cost_price
echo "Enter the selling price:"
read selling_price
if [ $selling_price -gt $cost_price ]; then
    profit=$((selling_price - cost_price))
    echo "Profit: $profit"
elif [ $cost_price -gt $selling_price ]; then
    loss=$((cost_price - selling_price))
    echo "Loss: $loss"
else
    echo "No profit, no loss."
fi
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./ass3q5.sh
Enter the cost price:
12000
Enter the selling price:
14000
Profit: 2000
```

Question 6: Write a shell script which receives any year from the keyboard and determines, whether the year is a leap year or not. If no argument is supplied the current year should be assumed.

Code:

```
if [ $# -eq 0 ]; then
        year=$(date +'%Y')
else
        year=$1
fi

if (( (year % 4 == 0 && year % 100 != 0) || year % 400 == 0)); then
        echo "$year is a leap year"
else
        echo "$year is not a leap year"
fi
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./ass3q6.sh
2023 is not a leap year
```

Question 7: Write a shell script allow that will display a message to enter internal mark and percentage in attendance, if the entered mark is greater than equal to 20 and entered percentage in attendance is greater that equal to 75 then display the message Allowed for Semester otherwise display the message Not allowed.

Code:

```
read -p "Marks : " internal
read -p "Attendance : " attendance
if [ $internal -ge 20 ] && [ $attendance -ge 75 ];
then
        echo "Allowed"
else
        echo "Not Allowed"
fi
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./allow.sh
Marks : 55
Attendance : 84
Allowed
```

Question 8: Write a shell script small3 that will compare three numbers passed as command linearguments and display the smallest one.

Code:

```
read -p "Number 1 : " n1
read -p "Number 2 : " n2
read -p "Number 3 : " n3

if [ $n1 -lt $n2 ] && [ $n1 -lt $n3 ]; then
        echo "Smallest : $n1"
elif [ $n2 -lt $n1 ] && [ $n1 -lt $n3 ]; then
        echo "Smallest : $n2"
else
        echo "Smallest : $n3"
fi

```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./small3.sh
Number 1 : 14
Number 2 : 24
Number 3 : 7
Smallest : 7
```

Question 9: Write a shell script check_char which will display one message to enter a character and according to the character entered it will display appropriate message from the following options:

a. You entered a lower case alphabet

b. You entered an upper case alphabet.

c. You have entered a digit.

d. You have entered a special symbol.

e. You have entered more than one character.

Code:

```
read -p "Enter Character : " char

if [[ -z "$char" ]];then
        echo "no char"
elif [[ ${char} -gt 1 ]];then
        echo "you have entered one character"
elif [[ "$char" =~ [a-z] ]];then
        echo "you have entered alphabet"
elif [[ "$char" =~ [A-Z] ]];then
        echo "you have entered uppercase"
elif [[ "$char" =~ [0-9] ]];then
        echo "you have entered digit"
else
        echo "Special"
fi
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./check_char.sh
Enter Character : A
you have entered uppercase
```

Question 10: Write a shell script class_time which will display one message to enter a day and according to the day entered it will display the DOS class time along with the room information or the message “No class on day_name” or “Holiday” for Sunday.

Code:

```
echo "Enter the day : "
read day

if [ "$day" == "Monday" ]; then
    echo "DOS Class Time: 08:00 AM - 10:00 AM"
    echo "Room: C-021"
elif [ "$day" == "Tuesday" ]; then
    echo "No DOS Class on Tuesday"
elif [ "$day" == "Wednesday" ]; then
    echo "No DOS Class on Wednesday"
elif [ "$day" == "Thursday" ]; then
    echo "DOS Class Time: 11:00 AM - 12:00 AM"
    echo "Room: C-112"
elif [ "$day" == "Friday" ]; then
    echo "DOS Class Time: 01:00 PM - 02:00 PM"
    echo "Room: C-112"
elif [ "$day" == "Saturday" ]; then
    echo "DOS Class Time: 11:00 AM - 12:00 PM"
    echo "Room: C-112"
elif [ "$day" == "Sunday" ]; then
    echo "Holiday No class on Sunday"
else
    echo "Invalid day entered. Please enter a valid day."
fi

```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./class_time.sh
Enter the day :
Monday
DOS Class Time: 08:00 AM - 10:00 AM
Room: C-021
```

Question 11: Write a shell script filechk that will take two file names as command line arguments, and check whether the content of two files are same or not . If contents of two files are same, then it will display the message: Files filename1 and filename2 have same content. then delete the second file and display the message: So filename2 is deleted. Otherwise display the message: Files filename1 and filename2 have different content.

Code:

```
if [ $# -ne 2 ]; then
    echo "Usage: $0 <filename1> <filename2>"
    exit 1
fi

file1="$1"
file2="$2"

if cmp -s "$file1" "$file2"; then
    echo "Files $file1 and $file2 have the same content."
    rm "$file2"
    echo "So $file2 is deleted."
else
    echo "Files $file1 and $file2 have different content."
fi
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./filechk.sh small3.sh allow.sh
Files small3.sh and allow.sh have different content.
```

Question 12: Write a shell script calculator that will take three command line arguments, where the first argument will specify the first operand, second argument will specify the operator and the third argument will specify the second operand and display the output of the arithmetic operation specified in the following format: op1 operator op2 = result . If the arguments will be passed in any other sequence, it will display the message:

"Invalid input "

Enter input in following format: op1 operator op2

The symbols to be used for different operators are as follows:

Addition:	+	Subtraction:	-
Multiplication:	x	Division:	/
Modulo:	%	Exponent:	^

Code:

```bash
if [ "$#" -ne 3 ]; then
    echo "Invalid input"
    echo "Enter input in the following format: op1 operator op2"
    exit 1
fi

op1="$1"
operator="$2"
op2="$3"

case $operator in
    "+")
        result=$(echo "$op1 + $op2" | bc)
        ;;
    "-")
        result=$(echo "$op1 - $op2" | bc)
        ;;
    "x")
        result=$(echo "$op1 * $op2" | bc)
        ;;
    "/")
        result=$(echo "scale=2; $op1 / $op2" | bc)
        ;;
    "%")
        result=$(echo "$op1 % $op2" | bc)
        ;;
    "^")
        result=$(echo "$op1 ^ $op2" | bc)
        ;;
    *)
        echo "Invalid operator. Supported operators are +, -, x, /, %, ^"
        exit 1
        ;;
esac

echo "$op1 $operator $op2 = $result"
```

Output:

```
aks_1299@Ghost:~/2141019334/DOS_2141019334/DOS_Assignment3$ ./calculator.sh 12 - 1
12 - 1 = 11
```