

Laboratory Assignment #No. 3
On
Design of Operating System (CSE 4049)

Submitted by

Name : Sourav Chandra Dey
Reg. No. : 2141004133
Semester : 5th
Branch : CSE
Section : 15 ('O')
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
FACULTY OF ENGINEERING & TECHNOLOGY (ITER)
SIKSHA 'O' ANUSANDHAN DEEMED TO BE UNIVERSITY
BHUBANESWAR, ODISHA – 751030

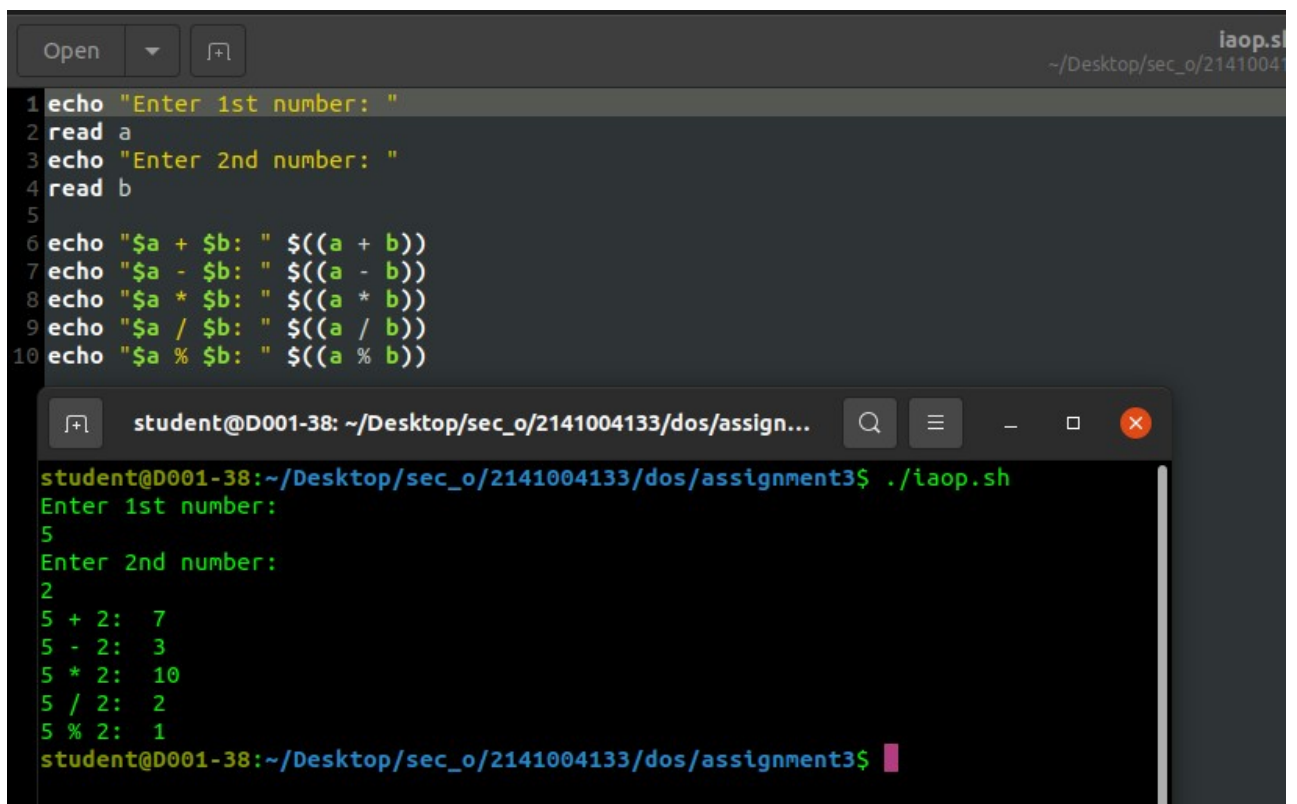
Laboratory Assignments 3
Subject: Design of Operating
Systems
Subject code: CSE 4049

Assignment 3: Shell Programming using user defined variables, arithmetic operators, conditional statements.

Objective of this Assignment:

- To learn the proper use of user defined variables and arithmetic operators in shell programming.
- To write shell script producing solution to decision making problems.

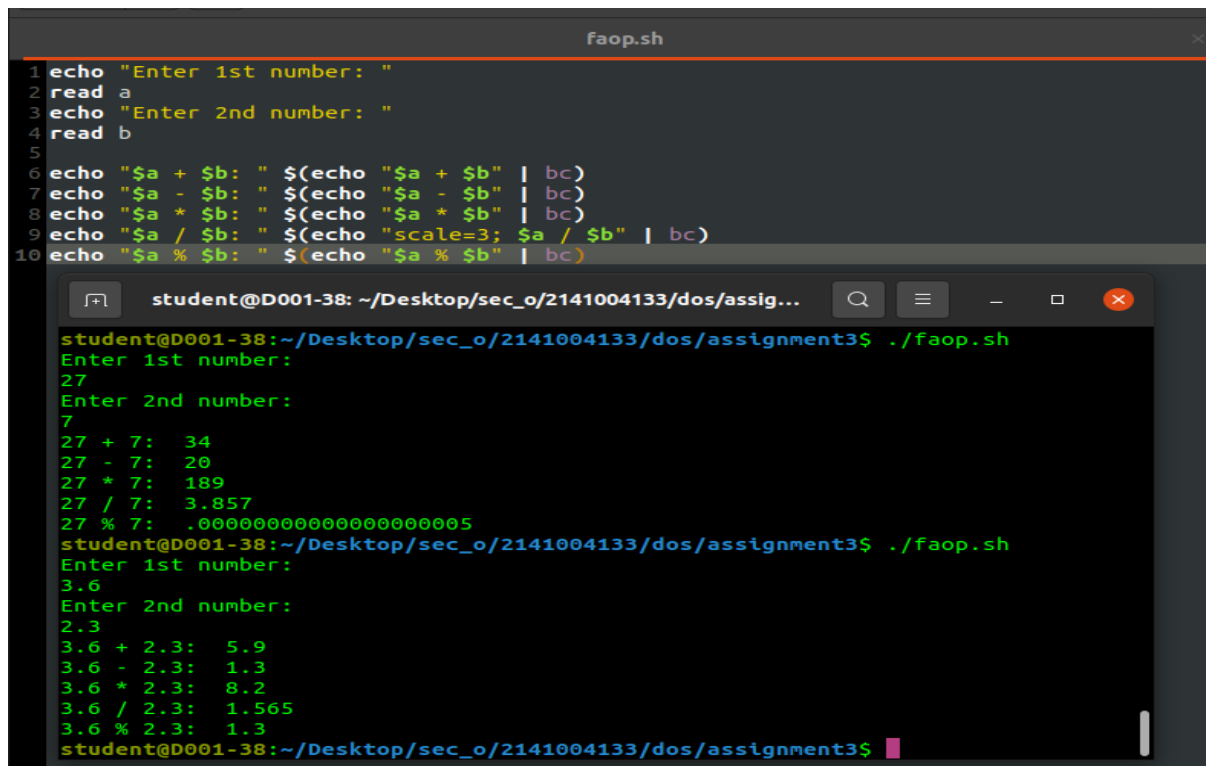
1. Write a shell script **iaop** to perform integer arithmetic on two numbers, where the value of the two numbers will be given during runtime.



```
1 echo "Enter 1st number: "
2 read a
3 echo "Enter 2nd number: "
4 read b
5
6 echo "$a + $b: " $((a + b))
7 echo "$a - $b: " $((a - b))
8 echo "$a * $b: " $((a * b))
9 echo "$a / $b: " $((a / b))
10 echo "$a % $b: " $((a % b))
```

```
student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./iaop.sh
Enter 1st number:
5
Enter 2nd number:
2
5 + 2: 7
5 - 2: 3
5 * 2: 10
5 / 2: 2
5 % 2: 1
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```


- 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.



```
faop.sh
1 echo "Enter 1st number: "
2 read a
3 echo "Enter 2nd number: "
4 read b
5
6 echo "$a + $b: " $(echo "$a + $b" | bc)
7 echo "$a - $b: " $(echo "$a - $b" | bc)
8 echo "$a * $b: " $(echo "$a * $b" | bc)
9 echo "$a / $b: " $(echo "scale=3; $a / $b" | bc)
10 echo "$a % $b: " $(echo "$a % $b" | bc)

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./faop.sh
Enter 1st number:
27
Enter 2nd number:
7
27 + 7: 34
27 - 7: 20
27 * 7: 189
27 / 7: 3.857
27 % 7: .00000000000000000005
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./faop.sh
Enter 1st number:
3.6
Enter 2nd number:
2.3
3.6 + 2.3: 5.9
3.6 - 2.3: 1.3
3.6 * 2.3: 8.2
3.6 / 2.3: 1.565
3.6 % 2.3: 1.3
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

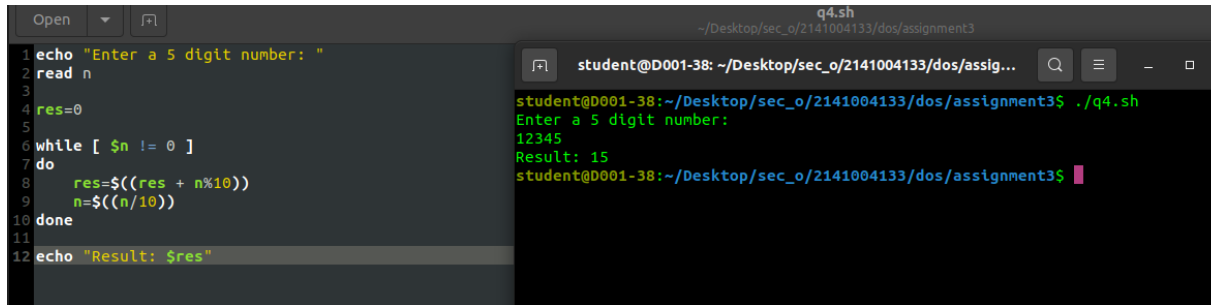
- Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to calculate his gross salary.



```
q3.sh
1 echo "Enter salary: "
2 read s
3
4 dearness=$(echo "$s * 0.4" | bc)
5 rent=$(echo "$s * 0.2" | bc)
6 salary=$(echo "$dearness + $rent + $s" | bc)
7
8 echo "Ramesh Salary: $salary"

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./q3.sh
Enter salary:
20000
Ramesh Salary: 32000.0
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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

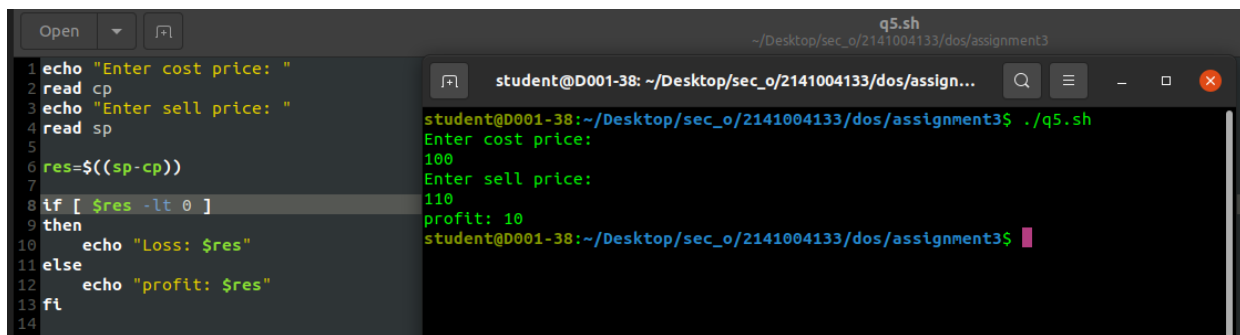


```
q4.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 echo "Enter a 5 digit number: "
2 read n
3
4 res=0
5
6 while [ $n != 0 ]
7 do
8     res=$((res + n%10))
9     n=$((n/10))
10 done
11
12 echo "Result: $res"

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./q4.sh
Enter a 5 digit number:
12345
Result: 15
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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.

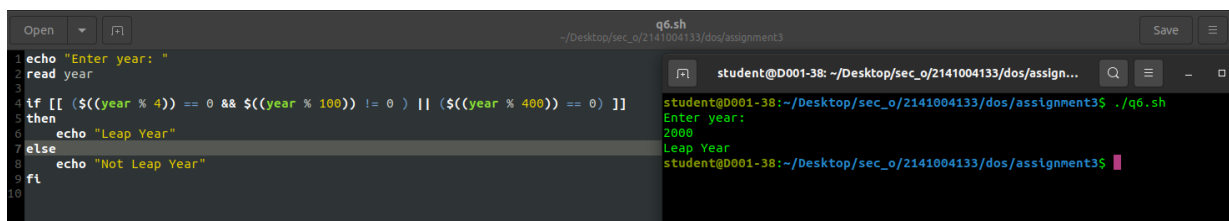


```
q5.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 echo "Enter cost price: "
2 read cp
3 echo "Enter sell price: "
4 read sp
5
6 res=$((sp-cp))
7
8 if [ $res -lt 0 ]
9 then
10     echo "Loss: $res"
11 else
12     echo "profit: $res"
13 fi
14

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./q5.sh
Enter cost price:
100
Enter sell price:
110
profit: 10
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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.

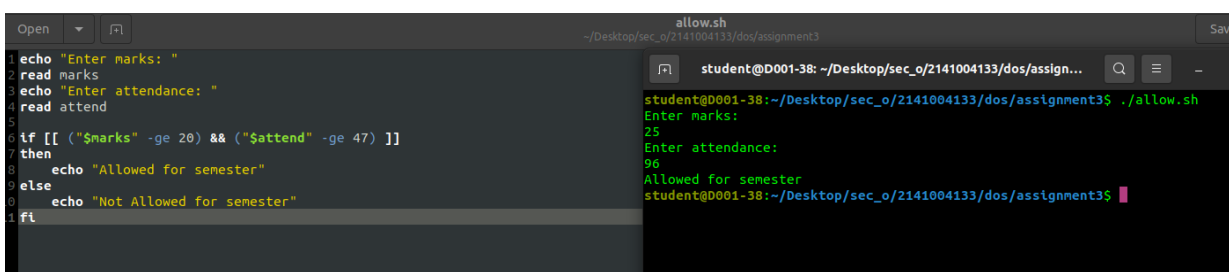


```
q6.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 echo "Enter year: "
2 read year
3
4 if [ [ $(($year % 4)) == 0 && $(($year % 100)) != 0 ] || $(($year % 400)) == 0 ] ]
5 then
6     echo "Leap Year"
7 else
8     echo "Not Leap Year"
9 fi
10

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./q6.sh
Enter year:
2000
Leap Year
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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.

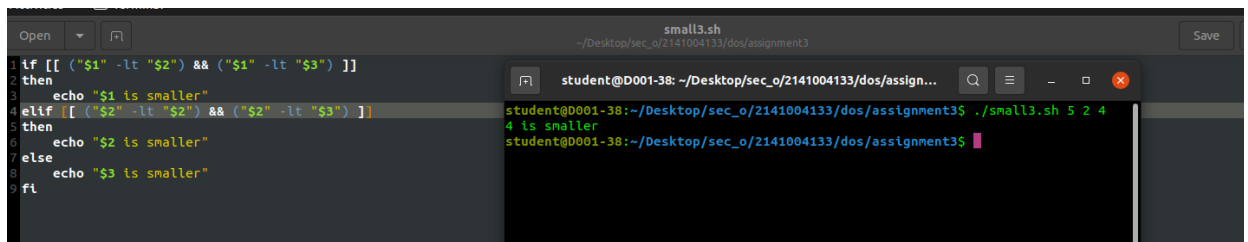


```
allow.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 echo "Enter marks: "
2 read marks
3 echo "Enter attendance: "
4 read attend
5
6 if [ [ ($marks -ge 20) && ($attend -ge 75) ] ]
7 then
8     echo "Allowed for semester"
9 else
10     echo "Not Allowed for semester"
11 fi

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./allow.sh
Enter marks:
25
Enter attendance:
96
Allowed for semester
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

8. Write a shell script **small3** that will compare three numbers passed as command line arguments and display the smallest one.

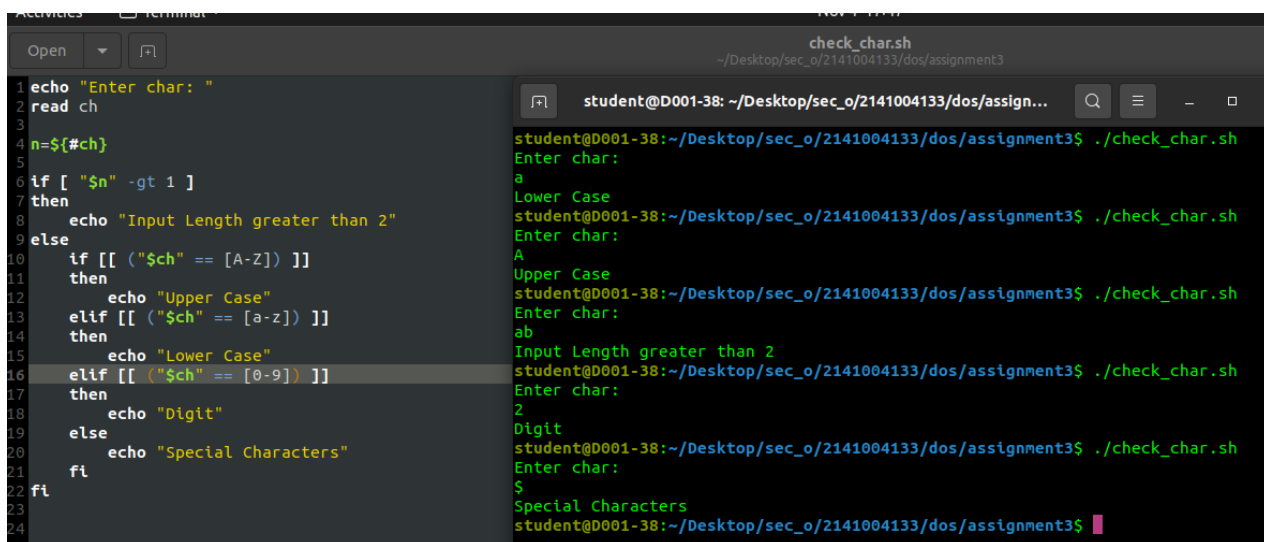


```
1 if [[ (" $1" -lt "$2") && (" $1" -lt "$3") ]]
2 then
3     echo "$1 is smaller"
4 elif [[ (" $2" -lt "$2") && (" $2" -lt "$3") ]]
5 then
6     echo "$2 is smaller"
7 else
8     echo "$3 is smaller"
9 fi
```

```
student@D001-38: ~/Desktop/sec_o/2141004133/dos/assign...
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./small3.sh 5 2 4
4 is smaller
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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:

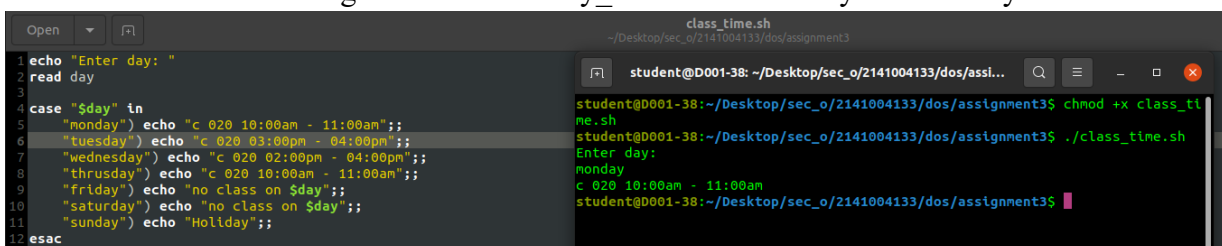
- You entered a lower case alphabet
- You entered an upper case alphabet.
- You have entered a digit.
- You have entered a special symbol.
- You have entered more than one character



```
1 echo "Enter char: "
2 read ch
3
4 n=${#ch}
5
6 if [ "$n" -gt 1 ]
7 then
8     echo "Input Length greater than 2"
9 else
10    if [[ (" $ch" == [A-Z] ) ]]
11    then
12        echo "Upper Case"
13    elif [[ (" $ch" == [a-z] ) ]]
14    then
15        echo "Lower Case"
16    elif [[ (" $ch" == [0-9] ) ]]
17    then
18        echo "Digit"
19    else
20        echo "Special Characters"
21    fi
22 fi
```

```
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./check_char.sh
Enter char:
a
Lower Case
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./check_char.sh
Enter char:
A
Upper Case
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./check_char.sh
Enter char:
ab
Input Length greater than 2
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./check_char.sh
Enter char:
2
Digit
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./check_char.sh
Enter char:
$
Special Characters
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

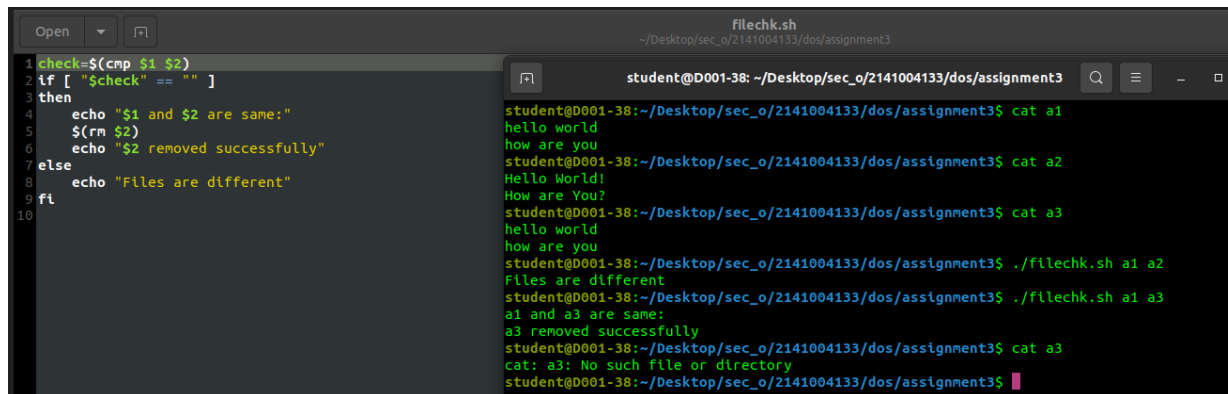
10. Write a shell script **class_time** which will display one message to enter a day and according to the day entered it will display the DOS class time along with the room information or the message “No class on day_name” or “Holiday” for Sunday.



```
1 echo "Enter day: "
2 read day
3
4 case "$day" in
5     "monday") echo "c 020 10:00am - 11:00am";;
6     "tuesday") echo "c 020 03:00pm - 04:00pm";;
7     "wednesday") echo "c 020 02:00pm - 04:00pm";;
8     "thrusday") echo "c 020 10:00am - 11:00am";;
9     "friday") echo "no class on $day";;
10    "saturday") echo "no class on $day";;
11    "sunday") echo "Holiday";;
12 esac
```

```
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ chmod +x class_time.sh
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./class_time.sh
Enter day:
monday
c 020 10:00am - 11:00am
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

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.



```
filechk.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 check=$(cmp $1 $2)
2 if [ "$check" == "" ]
3 then
4     echo "$1 and $2 are same:"
5     $(rm $2)
6     echo "$2 removed successfully"
7 else
8     echo "Files are different"
9 fi
10

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assignment3
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ cat a1
hello world
how are you
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ cat a2
Hello World!
How are You?
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ cat a3
hello world
how are you
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./filechk.sh a1 a2
Files are different
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./filechk.sh a1 a3
a1 and a3 are same:
a3 removed successfully
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ cat a3
cat: a3: No such file or directory
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$
```

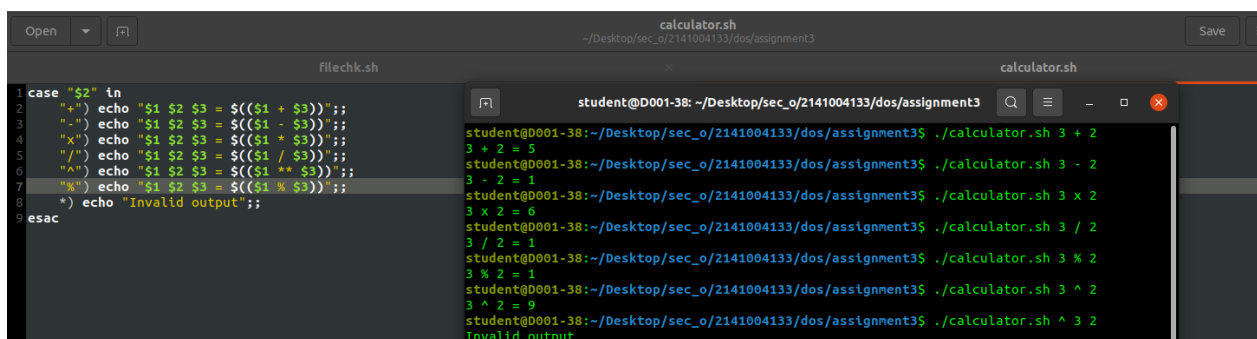
12. Write a shell script **calculator** that will take three command line arguments, where the first argument will specify the first operand, second argument will specify the operator and the third argument will specify the second operand and display the output of the arithmetic operation specified in 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:	^



```
calculator.sh
~/Desktop/sec_o/2141004133/dos/assignment3

1 case "$2" in
2     "+") echo "$1 $2 $3 = $((($1 + $3)))";;
3     "-") echo "$1 $2 $3 = $((($1 - $3)))";;
4     "x") echo "$1 $2 $3 = $((($1 * $3)))";;
5     "/" ) echo "$1 $2 $3 = $((($1 / $3)))";;
6     "%" ) echo "$1 $2 $3 = $((($1 % $3)))";;
7     "^") echo "$1 $2 $3 = $((($1 ** $3)))";;
8     *) echo "Invalid output";;
9 esac

student@D001-38: ~/Desktop/sec_o/2141004133/dos/assignment3
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 + 2
3 + 2 = 5
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 - 2
3 - 2 = 1
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 x 2
3 x 2 = 6
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 / 2
3 / 2 = 1
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 % 2
3 % 2 = 1
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh 3 ^ 2
3 ^ 2 = 9
student@D001-38:~/Desktop/sec_o/2141004133/dos/assignment3$ ./calculator.sh ^ 3 2
Invalid output
```



```
calculator.sh
~/2141001057/DOS_2141001057

1 case "$2" in
2     "+" ) echo $(( $1 + $3 ));;
3     "-" ) echo $(( $1 - $3 ));;
4     "x" ) echo $(( $1 * $3 ));;
5     "/" ) echo $(( $1 / $3 ));;
6     "%" ) echo $(( $1 % $3 ));;
7     "^" ) echo $(( $1 ** $3 ));;
8     *) echo "Invalid Input";;
9 esac

student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 + 2
9
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 - 2
5
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 / 2
3
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 ^ 2
49
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 x 2
14
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ ./calculator.sh 7 % 2
1
student@D001-38:~/2141001057/DOS_2141001057/D0Sass3$ 
```