

**Laboratory Assignment**  
**On**  
**Design Principles of Operating System**  
**(CSE 3249)**

**Submitted by**

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## 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.

```
dinanath@DINANATH:~$ nano iaop
dinanath@DINANATH:~$ chmod +x iaop
dinanath@DINANATH:~$ ./iaop
Enter the first integer: 10
Enter the second integer: 20
Division: 0
Sum: 30
Difference: -10
Product: 200
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano faop
dinanath@DINANATH:~$ chmod +x faop
dinanath@DINANATH:~$ ./faop
Enter the first number: 20
Enter the second number: 10
Division: 2.00
Sum: 30
Difference: 10
Product: 200
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano gross_salary
dinanath@DINANATH:~$ chmod +x gross_salary
dinanath@DINANATH:~$ ./gross_salary
Enter Ramesh's basic salary: 10000
Dearness Allowance (40%): 4000.0
House Rent Allowance (20%): 2000.0
Gross Salary: 16000.0
dinanath@DINANATH:~$ █
```

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

```
dinanath@DINANATH:~$ nano sum_of_digits
dinanath@DINANATH:~$ chmod +x sum_of_digits
dinanath@DINANATH:~$ ./sum_of_digits
Enter a five-digit number: 12345
Sum of the digits: 15
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano profit_loss
dinanath@DINANATH:~$ chmod +x profit_loss
dinanath@DINANATH:~$ ./profit_loss
Enter the cost price of the item: 100
Enter the selling price of the item: 70
Loss incurred: 30
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano leap_year
dinanath@DINANATH:~$ chmod +x leap_year
dinanath@DINANATH:~$ ./leap_year
2024 is a leap year.
dinanath@DINANATH:~$ █
```

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 than equal to 75 then display the message Allowed for Semester otherwise display the message Not allowed.

```
dinanath@DINANATH:~$ nano allow
dinanath@DINANATH:~$ chmod +x allow
dinanath@DINANATH:~$ ./allow
Enter internal marks: 20
Enter attendance percentage: 75
Allowed for Semester
dinanath@DINANATH:~$ █
```

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

```
dinanath@DINANATH:~$ nano small3
dinanath@DINANATH:~$ chmod +x small3
dinanath@DINANATH:~$ ./small3 10 20 5
The smallest number is: 5
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano check_char
dinanath@DINANATH:~$ chmod +x check_char
dinanath@DINANATH:~$ ./check_char
Enter a character: s
You entered a lower case alphabet.
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~$ nano class_time
dinanath@DINANATH:~$ chmod +x class_time
dinanath@DINANATH:~$ ./class_time
Enter a day (e.g., Monday, Tuesday): Wednesday
DOS class time: 2:00 PM - Room 202
dinanath@DINANATH:~$ █
```

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.

```
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ nano filechk
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ chmod +x filechk
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ ./filechk a.txt b.txt
Files a.txt and b.txt have different content.
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ █
```

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

```
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ nano calculator
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ chmod +x calculator
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ ./calculator 10 + 5
10 + 5 = 15
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ ./calculator 10 x 5
10 x 5 = 50
dinanath@DINANATH:~/DOS_2241004161/DOSass3$ █
```