

## Experiment Number: 6

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**Course Name:** OPERATING SYSTEM

**Course Code:** 21CSH-242

### 1. Aim/Overview of the practical:

To implement an arithmetic calculator using the shell script.

### 2. Platform used:

### 3. DISRIPTION

**GNU nano editor:** It is small, user-friendly text editor which is used for text editing & provides a plenty of enriching features ranging from undo/redo to syntax highlighting, auto-indentation, line numbers, files locking & backing up of files. Originally supposed to be a bug-for-bug emulation of pico text editor, nano is a 'modeless' editor where all keystrokes enter directly to the file, except Control & Meta sequences. Some other features include:

- Type the characters that are not present on the code with Double Esc or Alt+V followed by Unicode character into buffer.
- Provide the messages for any error which has occurred on the status bar.
- Put Anchor (temporary bookmark) for Forward/Backward jump.
- Configure & enable to work along with the mouse clicks.
- Search & replace the occurrence of a particular string inside the current buffer in a forward, literal & case-insensitive way
- Change certain aspects of the editor during editing without CLI or nanorc

**Control Sequence:** The sequence used to control the operation & is entered by holding down the Ctrl key & pressing the desired key.

**Meta Sequence:** It is a sequence of vectors comprising of semantic & syntactic tags & is hold down by pressing the Alt (Meta) key and pressing the desired key.

It is noteworthy that most shells don't type variables like C & other languages. In fact, all variables are strings but an integer string can be used for integer arithmetic. Variables are assigned values which can be printed using the `$<var_name>` to the user and become part of the shell environment until they are unset. There are many control operators supported by the shells from `&&` or `||` similar to their C-equivalents to the `$?` for the return code of last command.

Thus given the various features from the arrays, comments, subroutines, it is possible to even write the reasonably sophisticated applications at par with general-purpose programming languages with proper flow-constructs.

However, shells being used as programming language are limited by the little or no support for the data typing systems, object-oriented basics like classes or the lightweight programs, i.e., threads or the complex mathematical operations. These are far slower than compiled code or interpreted languages written with speed as the primary performance target.


#### 4. Algorithm/Flowchart



- Enter the GNU nano, using command nano calculator.sh.
- Inside calculator, input two numbers from the user & print the sum, difference, product & quotient of the two numbers.
- Save the program by clicking Ctrl+X, followed by clicking Y.
- Run the program from command terminal using chmod +X calculator.sh & print the output ./calculator.sh .
- STOP

## 5. Program Code </>

```
echo "Enter the first number"
read n1 echo "Enter the second
number" read n2
Sum=$(( $n1+$n2 ))
Diff=$(( $n1-$n2 ))
Pro=$(( $n1*$n2 ))
Quo=$(( $n1/$n2 )) echo
```

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```
"n1+n2= $Sum" echo  
"n1-n2= $Diff" echo  
"n1*n2= $Pro" echo  
"n1/n2= $Quo"
```

## 6. Steps for experiment / Screenshots:

- Inside the Oracle VM VirtualBox Manager, run your Ubuntu Virtual Machine & open the command terminal. Now, Creating the calculator.sh & opening it in the nano editor using invoke nano.

```
root@ABHISHEK: ~  
root@ABHISHEK:~# nano calculator.sh_
```

- In editor, write the code as provided above .

```
Select root@ABHISHEK: ~  
GNU nano 4.8 calculator.sh  
echo "enter the First number "  
read n1  
echo "Enter the Second Number"  
read n2  
sum = $((n1+n2))  
diff = $((n1-n2))  
product = $((n1*n2))  
quotient = $((n1/n2))  
echo "n1+n2 = $sum"  
echo "n1-n2 = $diff"  
echo "n1*n2 = $product"  
echo "n1/n2 = $quotient"
```



- On pressing Ctrl+X, you will be prompted to Save Modified Buffer?; press 'Y'



- Press Enter & return to the Command Terminal.
- Now, compile the program using the chmod command and enter the numbers.

```
cameron@cameron-VirtualBox:~$ nano calculator.sh
cameron@cameron-VirtualBox:~$ chmod +x calculator.sh
cameron@cameron-VirtualBox:~$ ./calculator.sh
Enter the first number
20
Enter the second number
10
n1+n2= 30
n1-n2= 10
n1*n2= 200
n1/n2= 2
cameron@cameron-VirtualBox:~$
```

## Learning Outcomes

1. To access the standard I/O using the bash commands editor in Command terminal.
2. To implement the bash commands in Linux using command-line interface.
3. To create, compile & run a shell program in Ubuntu System terminal.
4. To understand the working of nano editor in the Linux OS.
5. To take two numbers as input from the user & print back to the user.





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Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			
4.			