# Linux Plus for AWS and DevOps

Session - 5

CLARUSWAY
WAY TO REINVENT YOURSELF

Shell Scripting
$_
BASH
THE BOURNE-AGAIN SHELL

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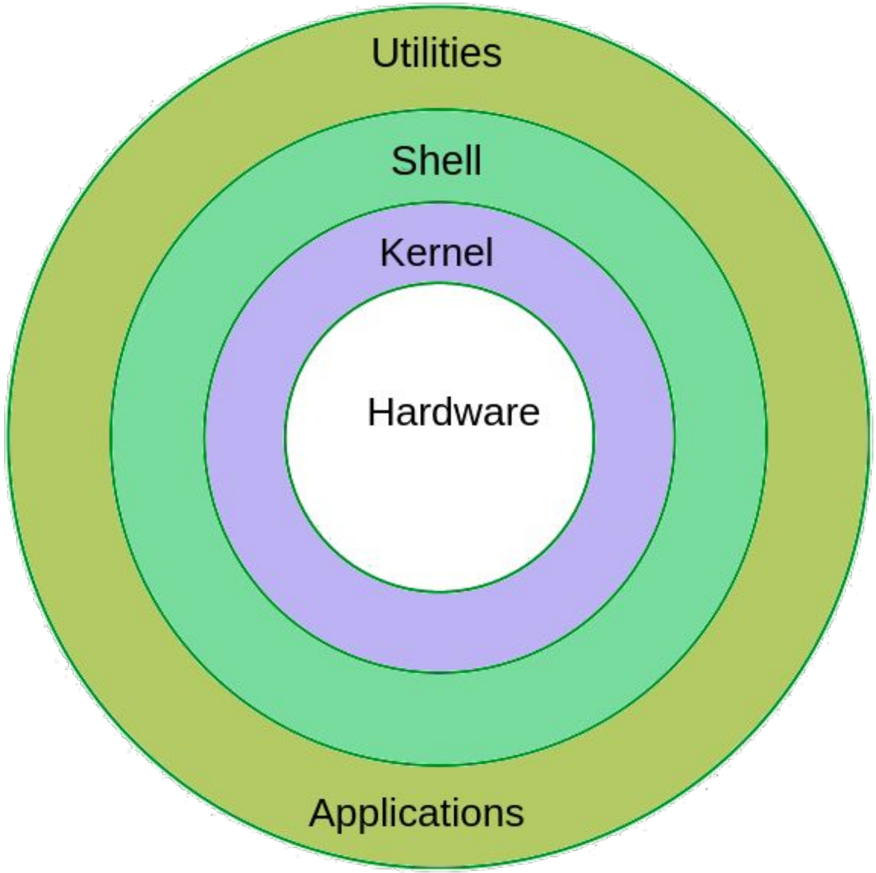
# Components of Linux

USER

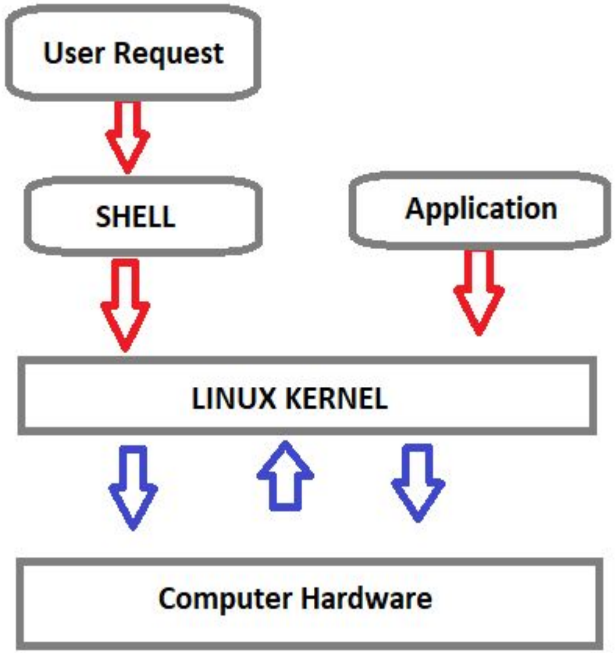


USER

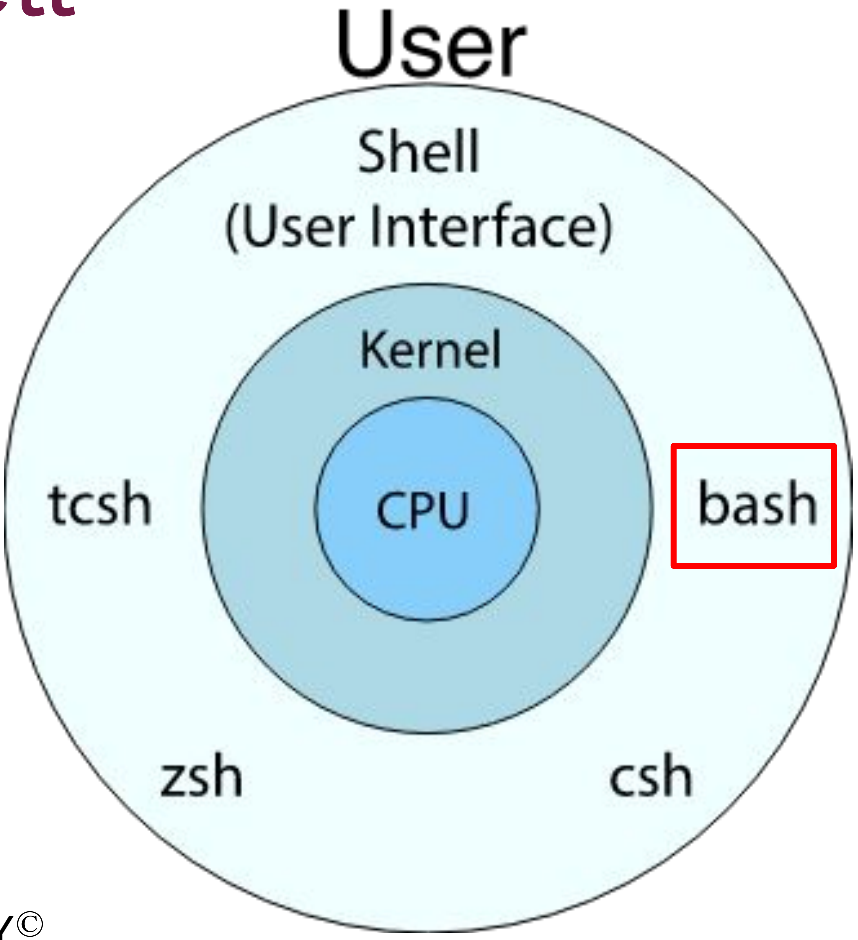
# What is SHELL?

Shell is **a program** that **receives** the user's **commands** and **gives** them to the **operating system to process** and displays the output.

The standard Linux shell is both a **command-line interpreter** and a **programming language.**



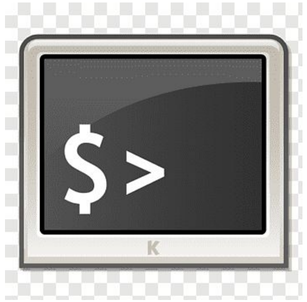
## Shell



SH

↓

Bourne-Again SHell



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## Shell Scripts

# Shell Scripts

**What is Shell Scripting?**

Shell Scripting is an open-source computer program designed to be run by the Unix/Linux shell which could be one of the following:

- The Bourne Shell
- The C Shell
- The Korn Shell
- The GNU Bourne-Again Shell

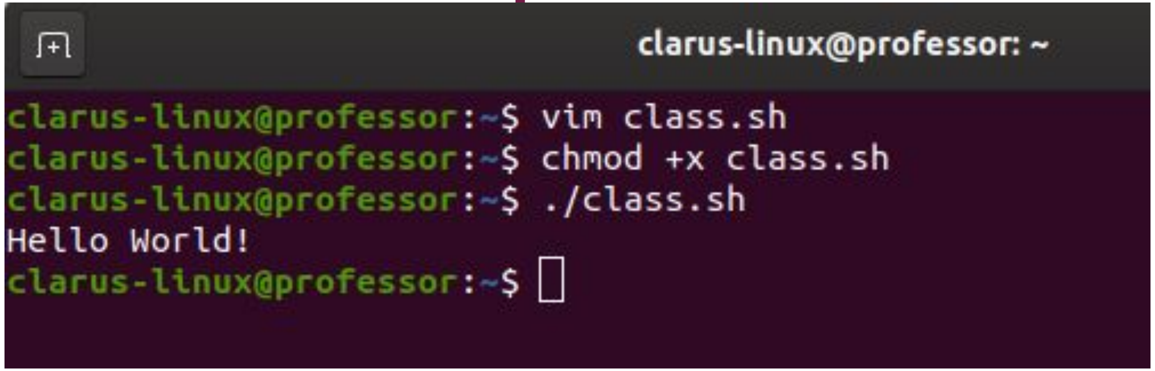
## Shell Scripts

**What is Shell Scripting?**

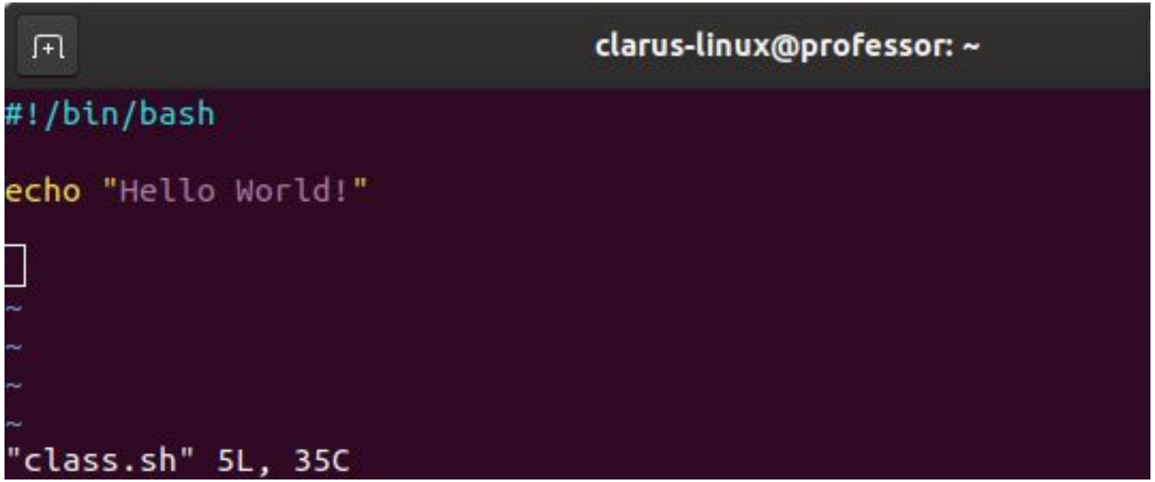
- Typical activities that can be done in a shell, such as file manipulation, program execution, and printing text, can also be done with the shell script.

- Lengthy and repetitive sequences of commands can be combined into a single script that can be stored and executed anytime.

# Shell Scripts



```
clarus-linux@professor: ~
clarus-linux@professor:~$ vim class.sh
clarus-linux@professor:~$ chmod +x class.sh
clarus-linux@professor:~$ ./class.sh
Hello World!
clarus-linux@professor:~$ 
```



```
clarus-linux@professor: ~
#!/bin/bash

echo "Hello World!"

~
~
~
~
"class.sh" 5L, 35C
```

**Shebang (#!)**

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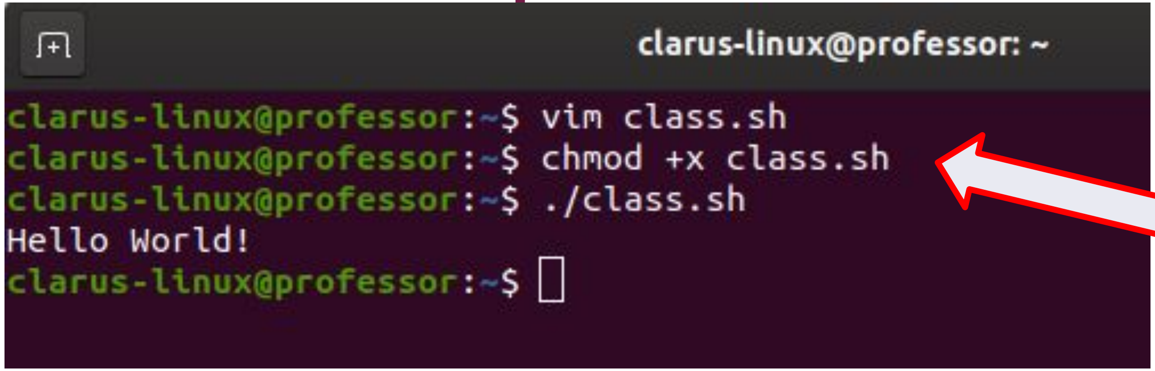
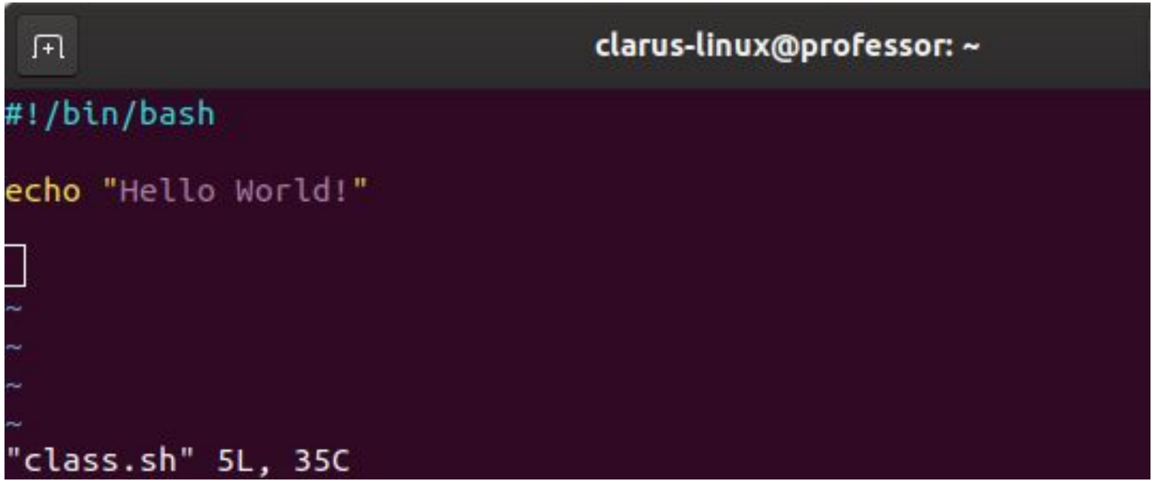
# Shell Scripts



clarus-linux@professor: ~

```
clarus-linux@professor:~$ vim class.sh
clarus-linux@professor:~$ chmod +x class.sh
clarus-linux@professor:~$ ./class.sh
Hello World!
clarus-linux@professor:~$ 
```

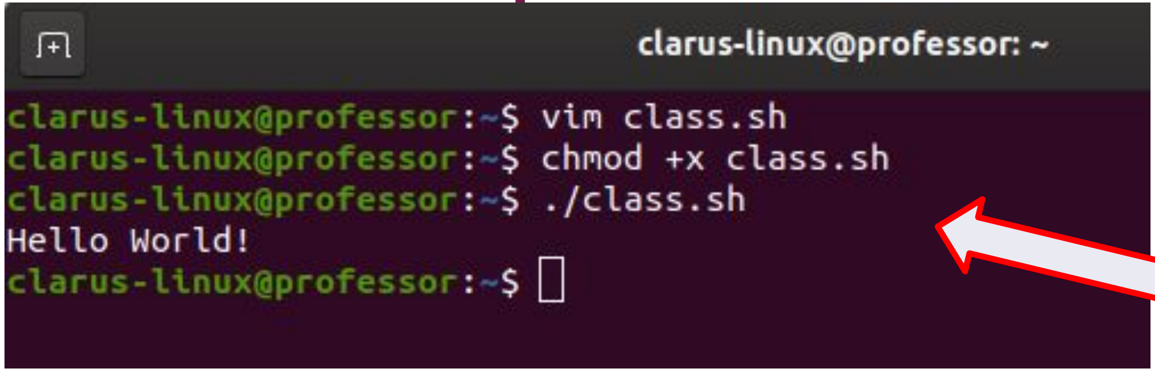


clarus-linux@professor: ~

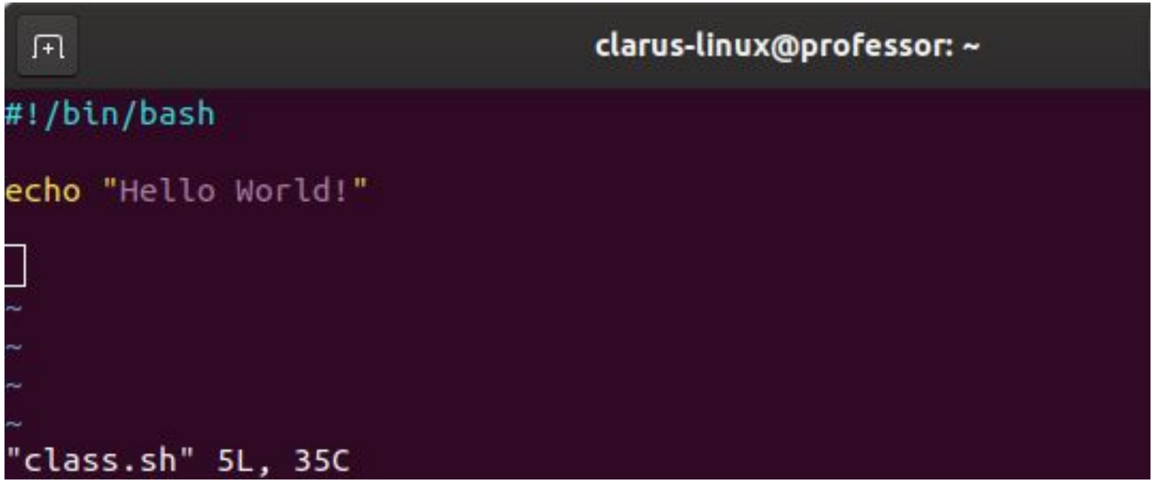
```
#!/bin/bash

echo "Hello World!"


~
~
~
~
"class.sh" 5L, 35C
```

chmod

# Shell Scripts



```
clarus-linux@professor:~$ vim class.sh
clarus-linux@professor:~$ chmod +x class.sh
clarus-linux@professor:~$ ./class.sh
Hello World!
clarus-linux@professor:~$
```



```
#!/bin/bash

echo "Hello World!"


~
~
~
~
"class.sh" 5L, 35C
```

"./"

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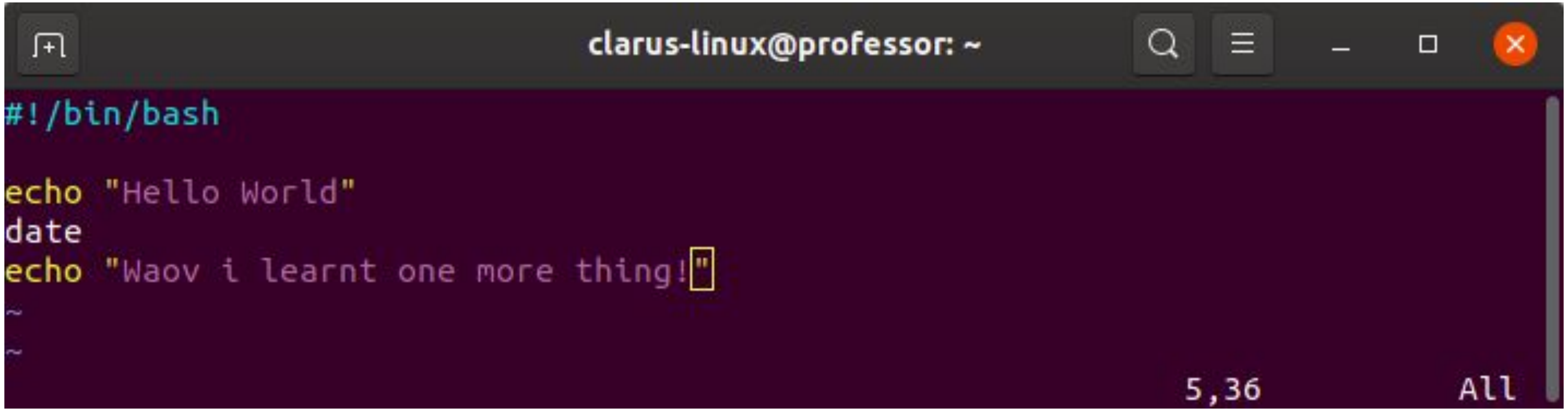
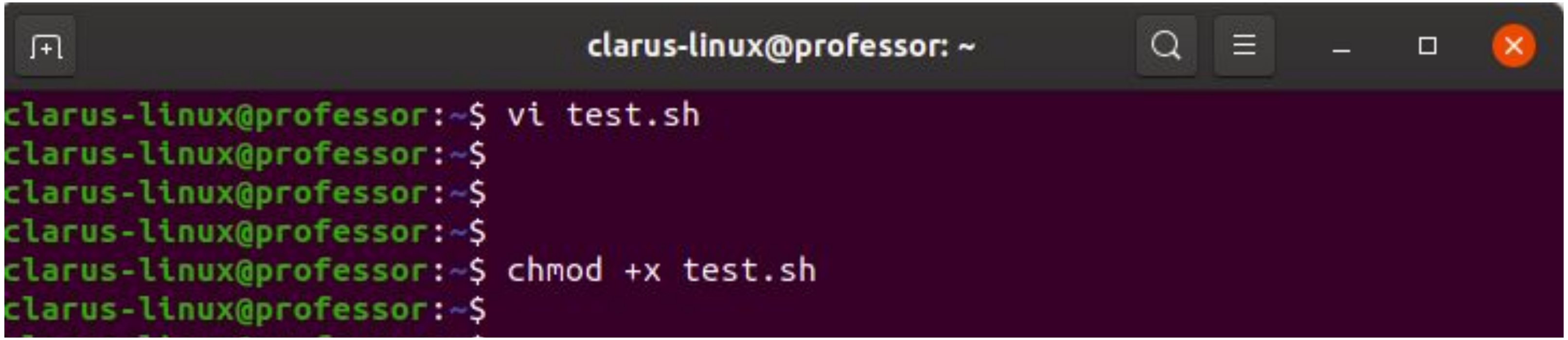
# Shell Scripts



```
#!/bin/bash

echo "Hello World"
date
echo "Waov i learnt one more thing!"
~
~
                                                    5,36          All
```



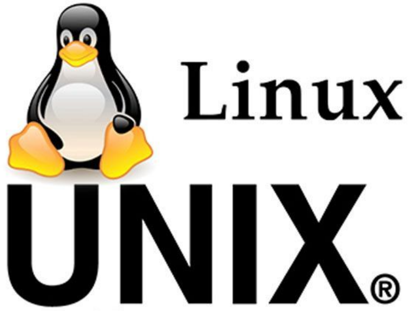
```
clarus-linux@professor:~$ vi test.sh
clarus-linux@professor:~$
clarus-linux@professor:~$
clarus-linux@professor:~$
clarus-linux@professor:~$ chmod +x test.sh
clarus-linux@professor:~$
```

# Exercise 1

1. Create a script named: “**my-first-script.sh**”

   It should print: “**This is my first script.**”

2. Make the script executable.
3. Execute the script.



## Homework

Create an environment that you don’t need to provide “./” before your scripts while executing them.

## Variables

- A variable is pointer to the actual data. The shell enables us to create, assign, and delete variables.
- The name of a variable can contain only letters (a to z or A to Z), numbers ( 0 to 9) or the underscore character (_) and beginning with a letter or underscore character.
- The reason you cannot use other characters such as !, *, or - is that these characters have **a special meaning for the shell.**

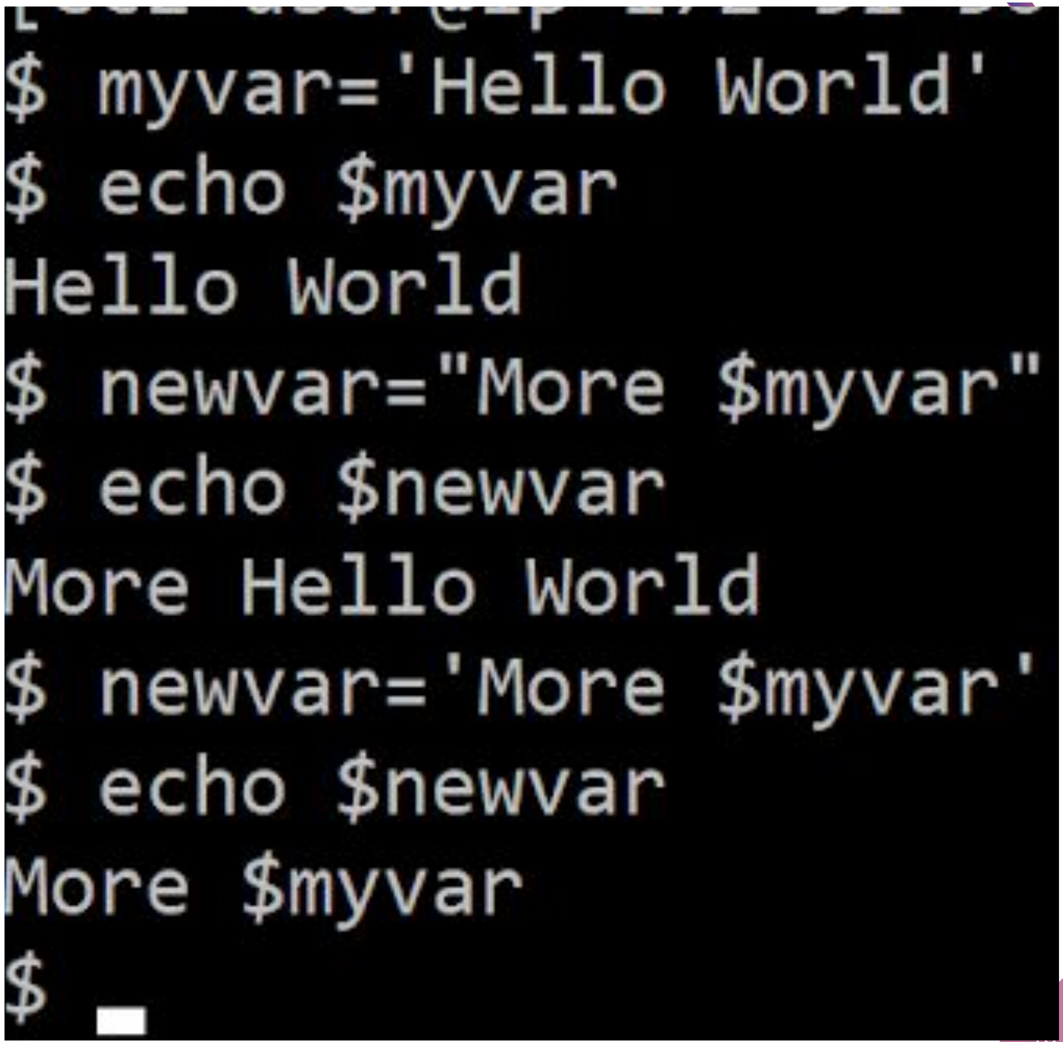
```
$VARIABLE=value
$echo $VARIABLE
value
$
$my_var=my_value
$echo $my_var
my_value
$
$my-var=my-value
my-var=my-value: command not
found
$
$myvar?=my-value
myvar?=my-value: command not
found
```

# Variables

**variable=value**

This is one of those areas where formatting is important. Note there is no space on either side of the equals ( = ) sign. We also leave off the $ sign from the beginning of the variable name when setting it.

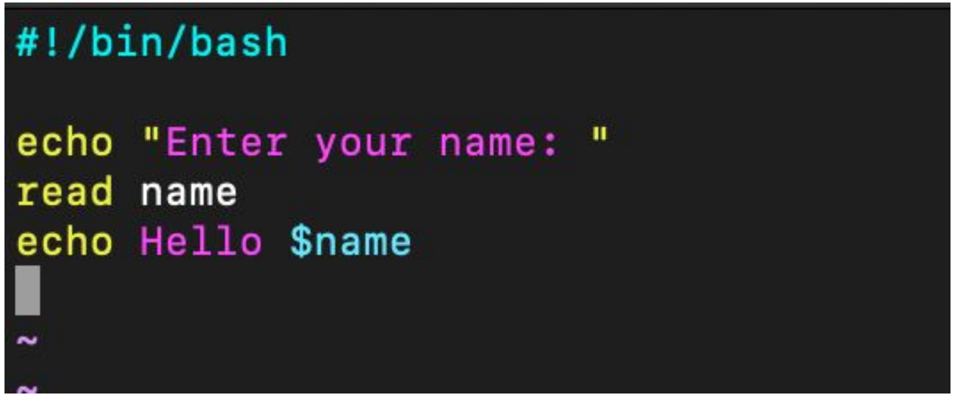
```
sampledir=/etc
ls $sampledir
```



```
$ myvar='Hello World'
$ echo $myvar
Hello World
$ newvar="More $myvar"
$ echo $newvar
More Hello World
$ newvar='More $myvar'
$ echo $newvar
More $myvar
$
```

## Console input

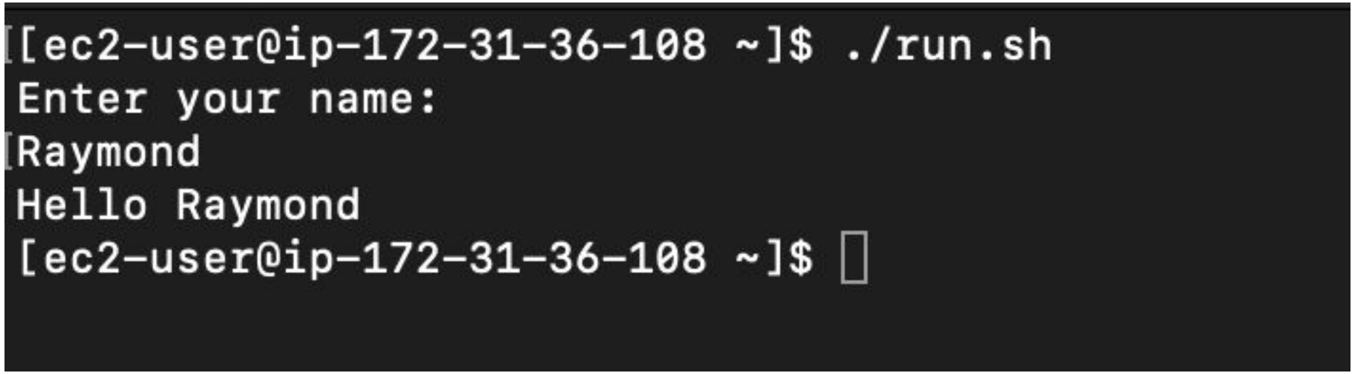
**read [variable-name]**



```
#!/bin/bash

echo "Enter your name: "
read name
echo Hello $name

~
~
```



```
[ec2-user@ip-172-31-36-108 ~]$ ./run.sh
Enter your name:
Raymond
Hello Raymond
[ec2-user@ip-172-31-36-108 ~]$ 
```

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# Console input

**read**

```
#!/bin/bash

read -p "Enter Your Name: "  username
echo "Welcome $username!"
```

```
#!/bin/bash

read -s -p "Enter Password: " pswd
echo $pswd
```

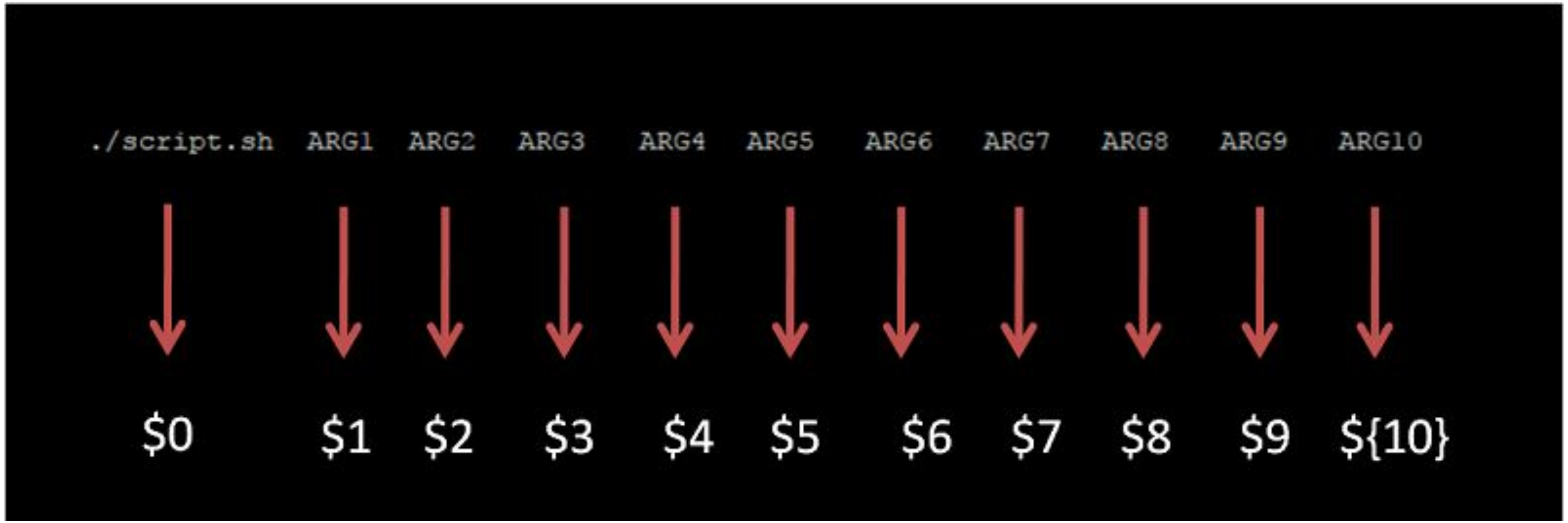
```
#!/bin/bash

read -sp "Enter Password: " pswd
echo $pswd
```

```
#!/bin/bash

echo What cars do you like?

read car1 car2 car3

echo Your first car was: $car1
echo Your second car was: $car2
echo Your third car was: $car3
```

# Command Line Arguments

**$0** - The name of the Bash script.
**$1 - $9** - The first 9 arguments to the Bash script.
**$#** - How many arguments were passed to the Bash script.
$@ - All the arguments supplied to the Bash script.
**$?** - The exit status of the most recently run process.
**$$** - The process ID of the current script.
**$USER** - The username of the user running the script.
**$HOSTNAME** - The hostname of the machine the script is running on.
**$SECONDS** - The number of seconds since the script was started.
**$RANDOM** - Returns a different random number each time is it referred to.
**$LINENO** - Returns the current line number in the Bash script.

# Command Line Arguments


./script.sh ARG1 ARG2 ARG3 ARG4 ARG5 ARG6 ARG7 ARG8 ARG9 ARG10
$0 $1 $2 $3 $4 $5 $6 $7 $8 $9 ${10}

# Simple Arithmetic

**expr** command **print** the value of expression to **standard output.**

**expr item1 operator item2**

**let** is a builtin function of Bash that helps us to do simple arithmetic. It is similar to **expr** except instead of printing the answer **it saves the result to a variable.**

**let <arithmetic expression>**

We can also evaluate arithmetic expression with double parentheses.

**$((arithmetic expression))**

# Arithmetic Expressions

`expr item1 operator item2`

```
#!/bin/bash
first_number=8
second_number=2

echo "SUM="`expr $first_number + $second_number`
echo "SUB="`expr $first_number - $second_number`
echo "MUL="`expr $first_number \* $second_number`
echo "DIV="`expr $first_number / $second_number`
```

```
$ chmod +x cal.sh
$ ./cal.sh
SUM=10
SUB=6
MUL=16
DIV=4
```

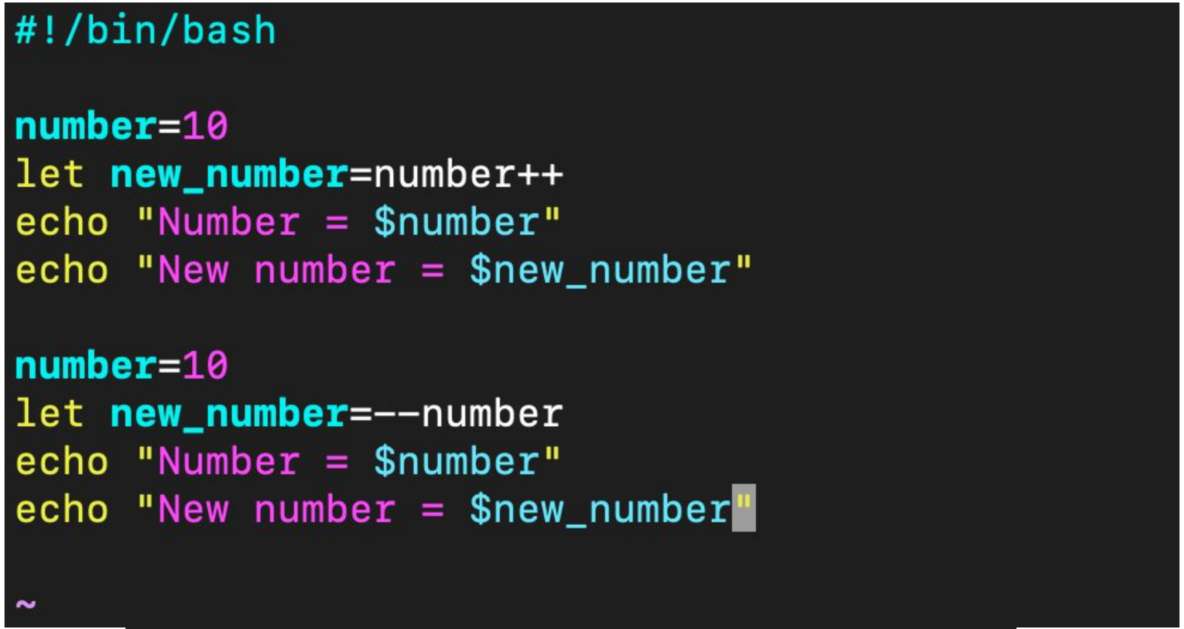
# Arithmetic Expressions

`let [expression]`

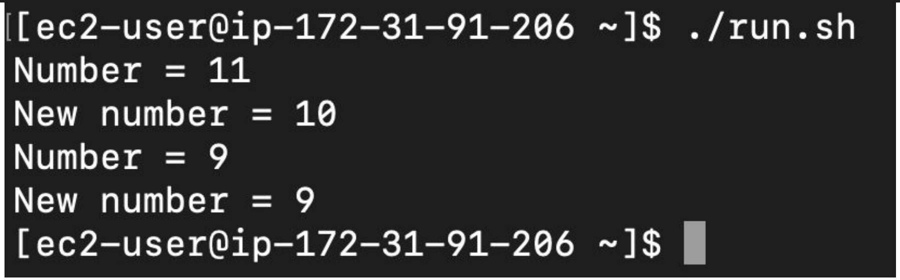
```bash
#!/bin/bash

number1=8
number2=2

let total=number1+number2
let diff=number1-number2
let mult=number1*number2
let div=number1/number2

echo "Total = $total"
echo "Difference = $diff"
echo "Multiplication = $mult"
echo "Division = $div"
```

```
$ ./run.sh
Total = 10
Difference = 6
Multiplication = 16
Division = 4
```

# “num++” “++num” “num--” “--num”



```
#!/bin/bash

number=10
let new_number=number++
echo "Number = $number"
echo "New number = $new_number"

number=10
let new_number=--number
echo "Number = $number"
echo "New number = $new_number"

~
```

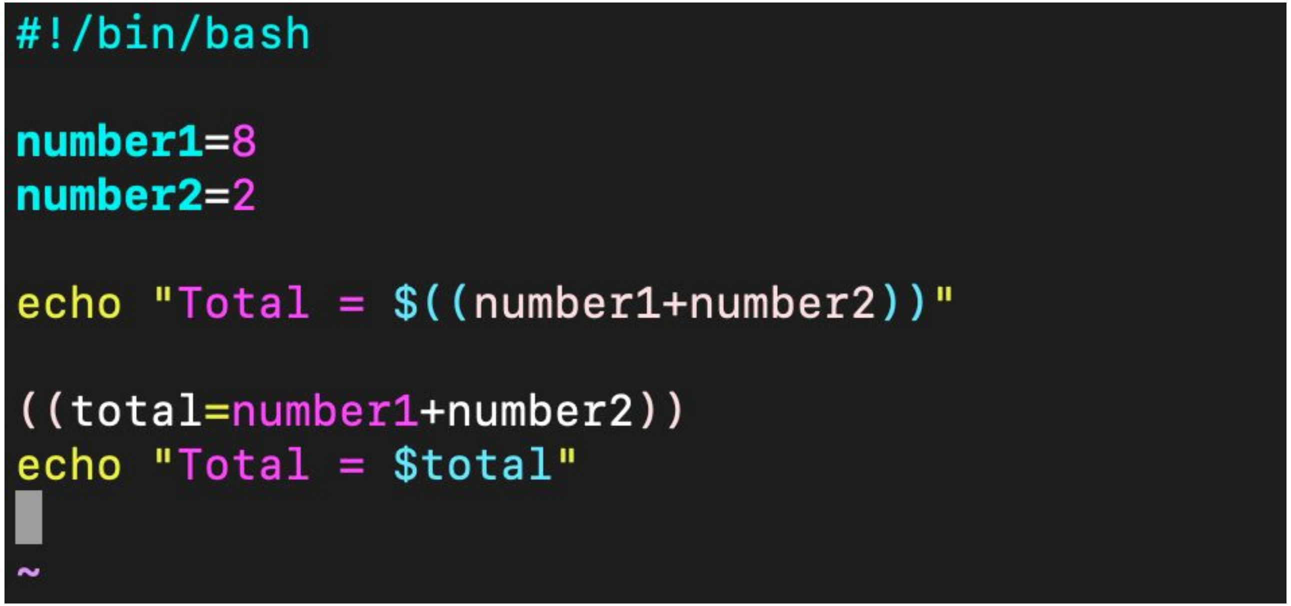


```
[ec2-user@ip-172-31-91-206 ~]$ ./run.sh
Number = 11
New number = 10
Number = 9
New number = 9
[ec2-user@ip-172-31-91-206 ~]$
```

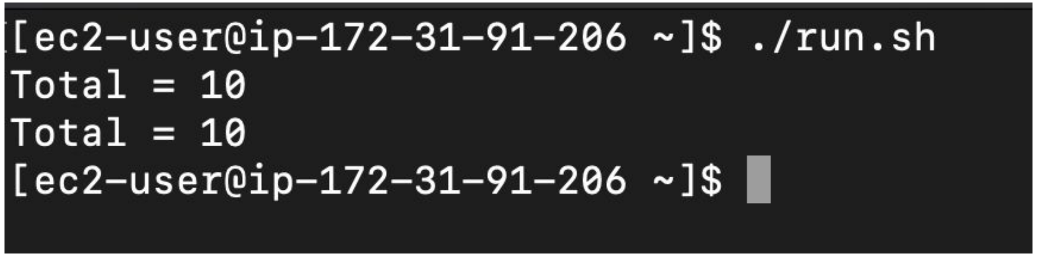
# Arithmetic Expressions

`$((Expression))`

`((Expression))`



```
#!/bin/bash

number1=8
number2=2

echo "Total = $((number1+number2))"

((total=number1+number2))
echo "Total = $total"

~
```



```
[ec2-user@ip-172-31-91-206 ~]$ ./run.sh
Total = 10
Total = 10
[ec2-user@ip-172-31-91-206 ~]$
```

# Exercise 1

1. Ask user to enter two numbers to variables **num1** and **num2.**
2. Calculate the total of 2 numbers.
3. Print the **total** number and increase it by 1.
4. Print the new value of the **total** number.
5. Subtract **num1** from the **total** number and print result.
6. Change the **num1** and **num2** variables to be passed from the **Command line arguments** instead of receiving them from the user

# Exercise 2

1. Create a script named **calculate.sh:**

   Create a variable named **base_value** with default value of **5**

   Request another number from user and assign it to **user_input** variable

   Add **user_value** to the **base_value** and assign it to **total** variable

   Print **total** to the screen with the message "**Total value is:** "

2. Make the script executable.
3. Execute the script.

# THANKS!

**Any questions?**