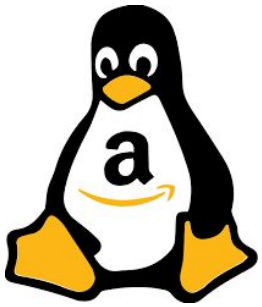
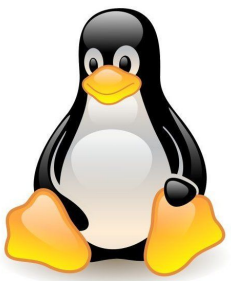
For Today's Class ...
Connect to a Linux EC2 Instance

1. Do Not log in as root user!
2. EC2 Service from AWS Console
3. Launch or Start Instance
4. Parameters, if launching:
   a. AMI: Amazon Linux 2
   b. Ensure Public IP is enabled
   c. Tag: Name=<your choice>
   d. SG: <open port 22 / your IP or 0.0.0.0/0>
   e. Key Pair: <your key pair>
5. From shell, WSL or gitbash:
   a. *ssh -i <pemfile.pem> ec2-user@<public dns>*



CLARUSWAY
WAY TO REINVENT YOURSELF

Linux Plus
for
AWS and DevOps
Session - 5



CLARUSWAY
WAY TO REINVENT YOURSELF

Shell Scripting

BASH

THE BOURNE-AGAIN SHELL

3 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 (#!)

#!/bin/bash Options

Special Character	Explanation
#!/bin/bash **-e**	Abort script at first error, when a command exits with non-zero status *(except in until or while loops, if-tests, list constructs)*
#!/bin/bash **-v**	Print each command to stdout before executing it
#!/bin/bash **-x**	Similar to -v, but expands commands

Can combine options:
#!/bin/bash **-xe**

Many options available; **-x** and **-v** are helpful for debugging

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

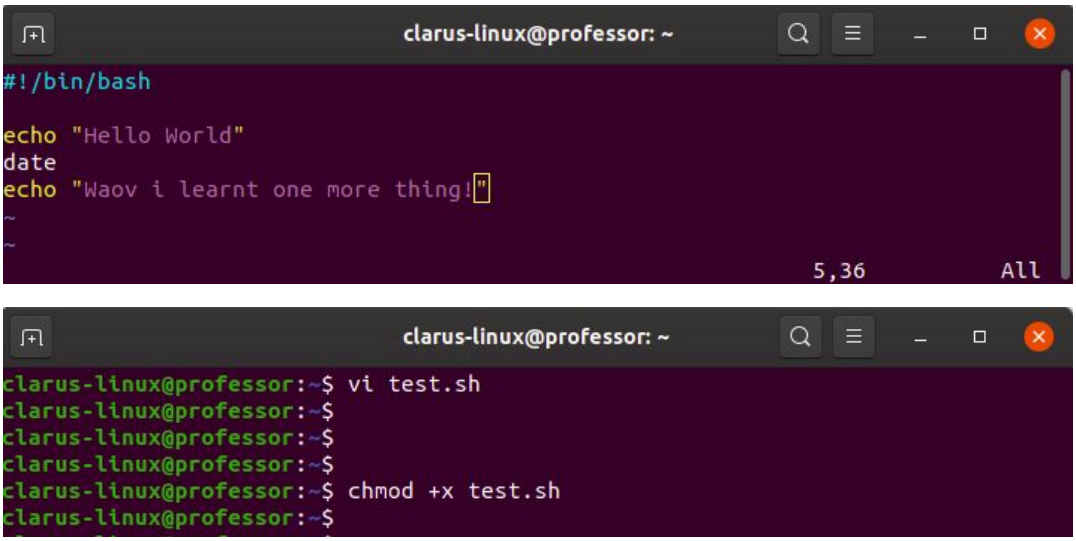
```
clarus-linux@professor: ~
#!/bin/bash

echo "Hello World!"

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

"./"

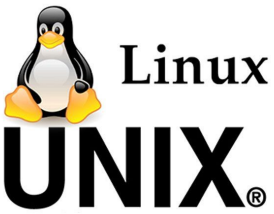
Shell Scripts



Exercise 1

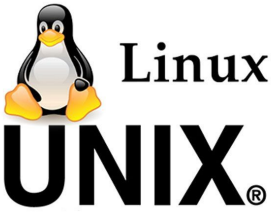
1. Create a script named: "**my-first-script.sh**"

   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.



CLARUSWAY
WAY TO REINVENT YOURSELF

Break
return @ 8pm

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 ~]$
```

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

CLARUSWAY
WAY TO REINVENT YOURSELF

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]`

```
#!/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 ~]$
```

CLARUSWAY©
WAY TO REINVENT YOURSELF

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 ~]$
```

CLARUSWAY©
WAY TO REINVENT YOURSELF

Exercise 1

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

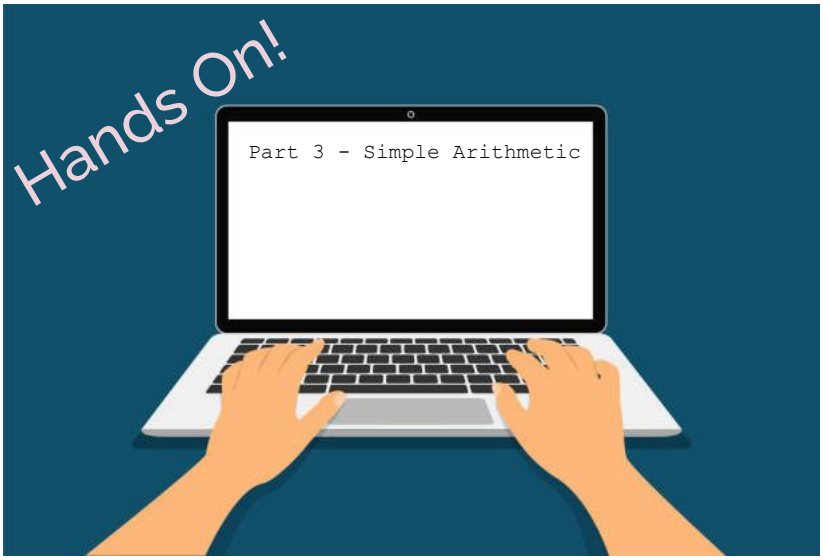
   Add **user_value** to the **base_value** and assign it to **total** variable

   Print **total** to the screen with the message "**Total value is:** "
2. Make the script executable.
3. Execute the script.

Exercise 2

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 this so that **num1** and **num2** are passed in from the command line

   (don't worry about checking for number of parameters passed in)



Kahoot!

THANKS!

Any questions?