BINF2111 – Introduction to Bioinformatics Computing
BASH 101 – while wild loops of function

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RAW Lab
Lecture 11 – Thursday Sep 27th, 2022

Learning Objectives

- Review quiz/bonus

- Review lab 4

- Review bash for loops

- Bash while loops

- Bash functions

- Quiz 11

Bonus 9

- Write a bash script that prints the working directory, counts all the sequences within a fasta files within the working directory, and prints the first five lines of the file into std_out.txt?

Quiz 10

Provide unique commands to convert a tsv to csv?

awk '{gsub(/\t/, ","); print}'
awk '{gsub(/\t /, ","); print}',
awk '{gsub(/\t/ , ","); print}'
awk '{gsub(/\t, ","); print}'

My input is:
more file.tsv
bill rod david
Xi abdul larry

command: head -1 file.txt | tail +2

What will the command do?

Quiz 10

My input is:
more file.tsv
bill rod david
Xi abdul larry
bill rod david
Xi abdul larry
steve bill larry

What is the command to print only lines 2 and 5 with the correct line numbers?

```
#!/bin/bash
for i in *.txt
do
   head "$i"
done
```
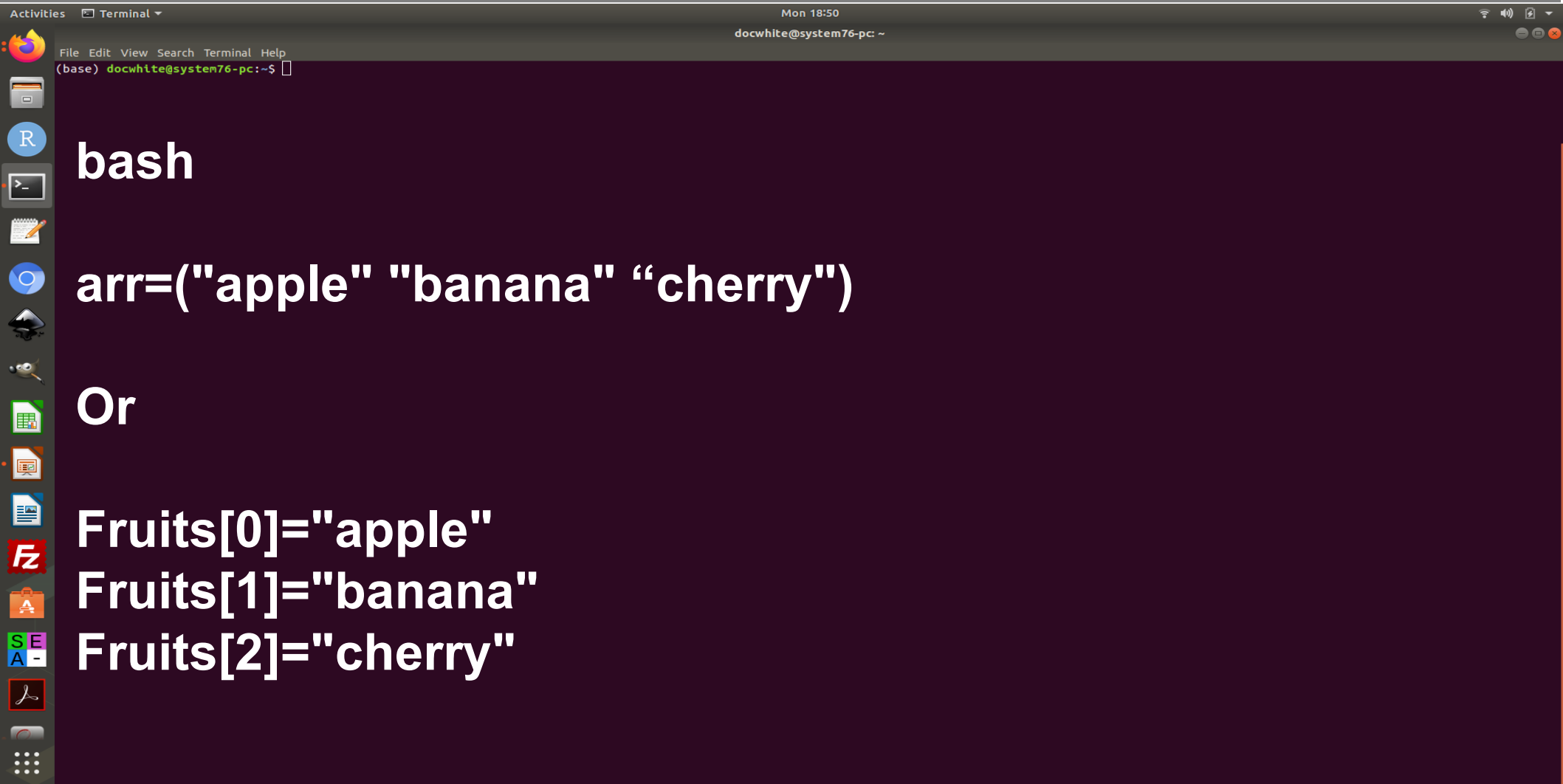
Will do what to files labeled .txt?

Array Variables in Bash

An array is a variable containing multiple values. Any variable may be used as an array.

There is no maximum limit to the size of an array, nor any requirement that member variables be indexed or assigned contiguously.

Arrays are zero-based: the first element is indexed with the number 0.

BASH arrays

docwhite@system76-pc: ~

File Edit View Search Terminal Help

(base) docwhite@system76-pc:~$

```
bash

arr=("apple" "banana" "cherry")

Or

Fruits[0]="apple"
Fruits[1]="banana"
Fruits[2]="cherry"
```

BASH for loop in arrays

Use a for loop to iterate over the elements of this array arr=("apple" "banana" "cherry")

BASH for loop in arrays

Use a for loop to iterate over the elements of this array arr=("apple" "banana" "cherry"), C-style?

BASH for loop in arrays

docwhite@system76-pc: ~

File Edit View Search Terminal Help

```
(base) docwhite@system76-pc:~$ ▯
```

How do we iterate over the indices of this array?
arr=("apple" "banana" "cherry")

BASH for loop in arrays

docwhite@system76-pc: ~

File Edit View Search Terminal Help

(base) docwhite@system76-pc:~$ ▯

Loop through specific indices of this array?

arr=([2]="apple" [4]="banana" [9]="cherry")

Lab Question 3

Write a bash script to count the number of ATG (starts) and TAA, TAG, TGA (stops) from the example2.fasta file.

Remember that ATG encodes for methionine so the only count the from the beginning of the sequence or the end for the stops.

HOW WOULD YOU DO THIS?

for i in file.*;do command $i done

BASH - for loop (C-style)

```
for ((i = 0 ; i < 100 ; i++)); do
  command $i
done
```

```
for (i = 0 ; i < 100 ; i++){
        command (i);
}
```

for **x in file:**

    command **(x)**

```bash
while[ condition ]
do
    command1
    command2
    command3
done
```

BASH - while loop

Command1 to Command3 will be executed repeatedly till condition is false. The argument for a while loop can be any boolean expression. Infinite loops occur when the conditional never evaluates to false. The while loop should be used as long as a certain condition is true, such as the a counter is less than a maximum value or the ping time to a server is lower than a threshold or forever if you loop while TRUE or while 1.

Here is the while loop one-liner syntax:
while [condition]; **do** commands; **done**
while control-command; **do** COMMANDS; **done**

BASH - until loop

The until loop is similar to the while loop but with reverse logic. Instead of looping while a condition is true you are assuming the condition is false and looping until it becomes true. They are reverse of each other in logical expression.

until [CONDITION]; do
    LINES OF CODE
    MORE LINES OF CODE
done

Function_name( ){
command
}

Think of a function as a small script within a script.
It's a small chunk of code which you may call
multiple times within your script.

MY FAVORITE WAY! (There is another way)

Function function_name( ){

command

}

Not my favorite. But, you may like it?

Quiz 11

- On canvas now

Bonus 11

- Write a function that will return the number of lines it has in it?