

# TU Dublin, Tallaght

## Department of Computing

### IT Scripting and Automation

#### Lab 7

#### Instructions:

Create a MS Word document with the solutions of each exercise. Include your name and x-number.

#### Exercise 1.

Provide **screenshots** of your AWK statements for question. You must also show your scripts/awk statements running (**screenshots**).

1. Create a text file called "Buses.txt" with the following content (*You can use VIM editor*):

```
RouteID, Destination, Day1, Day2, Day3, Day4, Company, Province
100, Cork, 32, 36, 36, 32, BusEireann, Munster
200, Belfast, 44, 9, 31, 10, BusEireann, Ulster
300, Limerick, 1, 33, 1, 25, BusEireann, Munster
400, Galway, 13, 39, 44, 34, BusEireann, Connacht
500, Waterford, 19, 39, 40, 23, BusEireann, Munster
```

This file contains the number ("**No**") of customers traveling on the first bus of the day from Dublin, over a 4 day period, to five destinations (in the 4 provinces).

#### Structure of the file

(RouteID, Destination, NoTravellersDay1, NoTravellersDay2, NoTravellersDay3, NoTravellersDay4, BusCompany, Province)

**Note:** the use of "," as the field separator and the first line is the header of the file (the header must be included in your file).

2. Write **AWK statements** that will calculate and display the following:
  - a) The total number of customers traveling to "Connacht" over the four days.
  - b) List the destination name **and** total count of the routes having more than 20 people traveling on Day1.
  - c) Average number of travellers on the five Bus Eireann routes.

Sample output: The average number of travellers per bus route over the four days is: 108.2

- d) The number of routes with more than 30 people traveling to "Munster" on day4.

## Exercise 2.

Create the following scripts (a,b,c). Provide screenshots of the scripts.

- a) A Python script (helloFunction.py) with a function called “hello” which will accept a parameter.

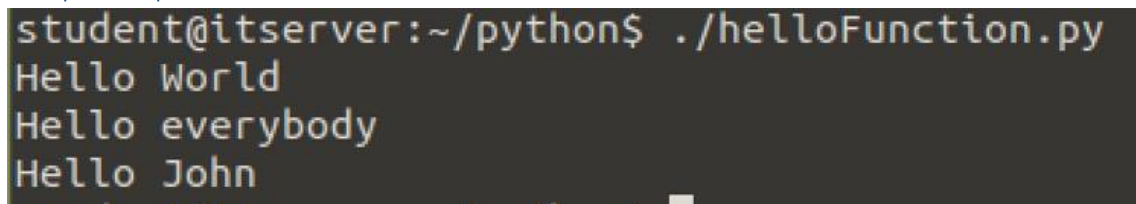
*Hint:*

```
def hello (parameter):  
    # Write the function code here  
    #
```

- within main part of the script call **hello** function using a parameter e.g.:  

```
hello ("World")  
hello ("everybody")  
hello ("John")
```

Sample Script Execution:



```
student@itserver:~/python$ ./helloFunction.py  
Hello World  
Hello everybody  
Hello John
```

- b) A Python script (fahrenheitToCelsius.py) with a function called “fahrenheit” which will accept a parameter and convert Celsius to Fahrenheit degrees.

**Formula:**  $\text{Temp\_in\_Fahrenheit} = (\text{Temp\_in\_celsius} * 9 / 5) + 32$

*Hint:*

```
def fahrenheit(Temp_in_celsius):  
    # Write the function code here  
    #
```

- Within main part of the script calculate Fahrenheit temperatures from 0 to 50 Celsius degrees
- use a loop) and call the function in every loop iteration.

### Sample Script Execution:

```
student@itserver:~/python$ ./fahrenheitToCelsius.py
1 celsius degrees are 33.8 Fahrenheit degrees
2 celsius degrees are 35.6 Fahrenheit degrees
3 celsius degrees are 37.4 Fahrenheit degrees
4 celsius degrees are 39.2 Fahrenheit degrees
5 celsius degrees are 41.0 Fahrenheit degrees
6 celsius degrees are 42.8 Fahrenheit degrees
7 celsius degrees are 44.6 Fahrenheit degrees
8 celsius degrees are 46.4 Fahrenheit degrees
9 celsius degrees are 48.2 Fahrenheit degrees
10 celsius degrees are 50.0 Fahrenheit degrees
11 celsius degrees are 51.8 Fahrenheit degrees
12 celsius degrees are 53.6 Fahrenheit degrees
13 celsius degrees are 55.4 Fahrenheit degrees
14 celsius degrees are 57.2 Fahrenheit degrees
15 celsius degrees are 59.0 Fahrenheit degrees
16 celsius degrees are 60.8 Fahrenheit degrees
17 celsius degrees are 62.6 Fahrenheit degrees
18 celsius degrees are 64.4 Fahrenheit degrees
19 celsius degrees are 66.2 Fahrenheit degrees
20 celsius degrees are 68.0 Fahrenheit degrees
21 celsius degrees are 69.8 Fahrenheit degrees
22 celsius degrees are 71.6 Fahrenheit degrees
23 celsius degrees are 73.4 Fahrenheit degrees
24 celsius degrees are 75.2 Fahrenheit degrees
25 celsius degrees are 77.0 Fahrenheit degrees
26 celsius degrees are 78.8 Fahrenheit degrees
27 celsius degrees are 80.6 Fahrenheit degrees
```

- c) A script (*math\_op.py*) with a function called "sum\_op" which will accept two parameters (numbers). Use the **return** statement.

*Hint:*

```
def sum_op(number1,number2):
    # Write the function code here
    return result

res = return_sum(4,5)
print("Addition result: " + str(res))
```

### Sample Script Execution:

```
student@itserver:~/python$ ./math_op.py
Addition result: 9
```

### Exercise 3.

- a) Create a **Python script** to calculate the:
  - Addition
  - subtraction
  - Multiplication
  - Division
  - The larger number
  - And to show if the numbers are even or odd numbers.of two numbers.
- b) Each of these operations should be created in a function.
- c) Read in the numbers provided by the user. (hint: use *input()* method)
- d) Make sure that the script is reusable (executable in a shell and importable in iPython) use:
  - `If __name__ == "__main__"`

### Exercise 4.

- a) Create a **Python script** to show (use functions – one for each point):
  - The ports that are 'listening' in your system
  - Disk usage in your system
  - Network interfaces
  - Routing table
  - Usage of the /tmp directory
  - All empty files in /tmp directory
  - show all the processes IDs of the user 'root'
- b) Use *'import subprocess'* and *'subprocess.call()'* methods.
- c) Make sure that the script is reusable (executable in bash shell and importable in iPython)