Bonus

The Climb

Lab Objectives

In this lab we will go through a set of problems with increasing difficulty.

Tasks

1. Write a Python program which accepts a sequence of comma-separated numbers from user and generate a list with those numbers.
   a. Sample data: 3, 5, 7, 23
   b. Output:
   c. List: ['3', ' 5', ' 7', ' 23']
   d. #Lists#Strings#Input

2. Write a Python program to calculate number of days between two dates.
   a. Sample dates: (2014, 7, 2), (2014, 7, 11)
   b. Expected output: 9 days
   c. #Dictionaries#Integers#Strings#Lists#Conditions#Input

3. Write a Python program to calculate the sum of three given numbers, if the values are equal then return three times of their sum.
   a. #Variables#Condiions

4. Write a Python function to count how many times a value appears in a list. (Input args: value, list)
   a. #Lists#Loops#Conditions#Functions

5. Write a Python functions to check whether a specified value is contained in a group of values.
   (Input args: value, list)
        Test Data:
   a. -3 -> [1, 5, 8, 3]: True
   b. -1 -> [1, 5, 8, 3]: False
   c. #Conditions#Functions

6. Write a Python function that takes a list of values and determines whether all the values are different from each other.
   a. #Dictionaries#Functions#Conditions

7. Write a Python function that takes a filename and determines how often each character appear in it.
   a. #Dictionaries#Functions#Conditions

8. Write a Python program to create all possible strings by using 'a', 'e', 'i', 'o', 'u'. Use the characters exactly once. #Loops#Lists

9. Write a program implementing a "Bubble" Sort on a list of numbers.
   a. Bubble sort:
   b. Each pass of the list - the highest value is found and inserted in the highest slot in the list.
   c. The highest value "Floats to the correct location"

10. Write a program that accepts a set of values and uses it to "generate" a list of potential passwords:
    a. Values: Date-Of-Birth, First Name, Last Name, Spouse First Name, Spouse Last Name, Pet Name

11. Write a program collecting and outputting the results of the following commands on a linux machine:
Distro:
cat /etc/issue
Kernel Version:
uname -a
Root processes:
ps aux | grep root
Networking Details:
ip a
ARP Cache:
arp -e
Current user:
id
Last logins:
who
How can files be uploaded?
find / -name wget
find / -name nc*
find / -name netcat*
find / -name tftp*
find / -name ftp

12. Calculating the Monty Hall problem: As host of the TV game show Let's Make a Deal, Monty Hall would show contestants three closed doors and ask them to choose one. Behind one door was a valuable prize; behind the other two were smelly old goats. As soon as the contestant chose a door, Monty would open one of the remaining doors to reveal a goat. The contestant was then given a final choice: switch doors or stay with their initial pick.
    a. Create a "simulation" that receives a number of runs and calculates how often does the contestant win when not changing door vs when changing it.