MIDDLE EAST TECHNICAL UNIVERSITY, NORTHERN CYPRUS CAMPUS
CNG445 Software Development with Scripting Languages – Worksheet 2

Python Basics: Syntax, Primitive Types, Variables, Basic Operators, Decision Making, Loops, Sequences (Strings, Lists, Tuples).

1. Execute the following commands:
In [1]: row2=['Li', 'Be', 'B', 'C', 'N', 'O', 'F', 'Ar']
In [2]: ptable1=["H","Xe",row2]
In [3]: ptable2=ptable1[:]

a. Is ptable1 a list, a list of lists or a mix of both? (Print it out!)
b. Correct element "Xe" in ptable2 to be "He". Is the change propagated to ptable1?
c. Correct element "Ar" in ptable2 to be "Ne". Is the change propagated to ptable1 and to row2?

2. Execute the following commands
In [1]: row2=['Li', 'Be', 'B', 'C', 'N', 'O', 'F', 'Ar']
In [2]: ptable1=["H","Xe",row2]
In [3]: import copy
In [4]: ptable2=copy.deepcopy(ptable1)

Now correct the "Ar" to "Ne" by assigning the right element of ptable2. Inspect to see whether the elements of ptable1 or row2 have changed.

3. Does the following operation create a shallow copy or a deep copy?
In [1]: a = [1,2,3]
In [2]: b = list(a)

4. Write a program that prompts the user to enter a list which consist of sub-lists with two items. The program should then evaluate and sort the list based on the second item of the sub-lists in descending order.

5. Write a program that takes a sentence from the user and capitalize the first letter of each word by using a list compression. You can use the split method to split the sentence into the words, e.g. sentence.split(). You can use the upper method to make a letter uppercase, e.g. letter.upper().

Sample run:
Enter a sentence: This is the third worksheet
This Is The Third Worksheet

6. Suppose that you are given a string and you want to count how many times each letter appears. Write a program that creates a dictionary with characters as keys and counters as the corresponding values. The first time you see a character, you would add an item to the dictionary. After that you would increment the value of an existing item.

7. A postal code ***P*** must be a number in the range of (100000, 999999).
A postal code ***P*** must not contain more than one alternating repetitive digit pair.

Alternating repetitive digits are digits which repeat immediately after the next digit. In other words, an alternating repetitive digit pair is formed by two equal digits that have just a single digit between them.

For example:
121426 # Here, 1 is an alternating repetitive digit.
523563 # Here, NO digit is an alternating repetitive digit.
552523 # Here, both 2 and 5 are alternating repetitive digits.

Your task is to validate whether ***P*** is a valid postal code or not. You are not allowed to use if statements.
Input Format
One single line of input containing the string ***P***.

Output Format
Print "True" if ***P*** is valid. Otherwise, print "False". Do not print the quotation marks.

Sample Input
110000

Sample Output
False

References:

1. An undergraduate course offered by the Research School of Computer Science at Australian National University (Programming for Scientists).
2. Downey, Allen (2009) Python for Software Design: How to Think Like a Computer Scientist, New York, NY: Cambridge University Press. ISBN: 978-0521725965
3. https://www.hackerrank.com/