**LAB 1 – Introduction to Python**

**Marks = 1.5**

**Submission =**

* **This lab must be completed in the class. You must show the completion to the Instructor/GA to get the grade. Write your answers in front of each question in bold.**
* **Each student should work individually on this lab.**

**NOTE**: Use Python’s **IDLE** interactive tool. Write your answer beside each command in this sheet in **bold**.

**Part 1 - Lists in Python**: Given the following two lists:

list1 = ["apple", 10, 3.14, [1, 2, 3], "class", 20, [4.5, 6.7], 5.5]

list2 = [8, "list in python", [9.1, 7.2], 15, "MAC", [2, 4, 6], 3.33, 12.5]

***1.1 - Work with list indexing and slicing***:

Indicate the results if you type the following commands in IDLE:

1. list1[2][1]
   * **TypeError: 'float' object is not subscriptable**
2. list2[3][0]
   * **TypeError: 'int' object is not subscriptable**
3. list1[4][2][1]
   * **IndexError: string index out of range**
4. len(list2)
   * **8**
5. list1[12]
   * **IndexError: list index out of range**
6. list2[-4:-1]
   * **['MAC', [2, 4, 6], 3.33]**
7. list1[2:14]
   * **[3.14, [1, 2, 3], 'class', 20, [4.5, 6.7], 5.5]**
8. list2+list1
   * **[8, 'list in python', [9.1, 7.2], 15, 'MAC', [2, 4, 6], 3.33, 12.5, 'apple', 10, 3.14, [1, 2, 3], 'class', 20, [4.5, 6.7], 5.5]**
9. list1\*2
   * **['apple', 10, 3.14, [1, 2, 3], 'class', 20, [4.5, 6.7], 5.5, 'apple', 10, 3.14, [1, 2, 3], 'class', 20, [4.5, 6.7], 5.5]**
10. list2[5][1] = 0
    * **[8, 'list in python', [9.1, 7.2], 15, 'MAC', [2, 0, 6], 3.33, 12.5]**
11. del list1[-3]
    * **['apple', 10, 3.14, [1, 2, 3], 'class', [4.5, 6.7], 5.5]**

***1.2 - Work with list methods and data types***:

Type python commands to do the following:

1. append the string 'university' to list1
   1. **list1.append(“university”)**
   2. **['apple', 10, 3.14, [1, 2, 3], 'class', 20, [4.5, 6.7], 5.5, 'university']**
2. remove the last element of list2
   1. **del list2[-1]**
   2. **[8, 'list in python', [9.1, 7.2], 15, 'MAC', [2, 4, 6], 3.33]**
3. insert the item 100 at index 5 in L1
   1. **list1[5] = 100**
   2. **['apple', 10, 3.14, [1, 2, 3], 'class', 100, [4.5, 6.7], 5.5, 'university']**
4. add the integers (together) in the list [44, 50] at the end of list2
   1. **list2 += [44,50]**
   2. **[8, 'list in python', [9.1, 7.2], 15, 'MAC', [2, 4, 6], 3.33, 44, 50]**

**Part 2 - Strings in Python:** Given the following two strings:

str1 = "Django allows a rapid web development and creates scalable systems"

str2 = "There are two areas in cloud computing: performance and security"

***2.1 - Work with string indexing, slicing, assignment, and concatenation***: Indicate the results if you type the following commands in IDLE. Indicate the reason for each answer. Ex. The answer is ‘o’ because o is at index [7].

1. str2[-1:-6:-1]
   1. **'ytiru'**
   2. **It is starting from last and going till -6 and that too in reverse direction**
2. str1[9]
   1. **‘l’**
   2. **As it is at the 9th index of the str1**
3. str2[-2:]
   1. **‘ty’**
   2. **Giving last 2 indexes as we traverse from last 2nd index to the very end**
4. str2[0:20:3]
   1. **'Tra ors'**
   2. **Going from index 0 to 20th [technically 19th], with the gap of 3**
5. str1+" "+str2
   1. **'Django allows a rapid web development and creates scalable systems There are two areas in cloud computing: performance and security'**
   2. **Adding str1 and str2 with a space in between**

***2.2 - Work with string methods***: Use **str** methods to do the following and indicate the corresponding results.

1. Check if the string str1 ends with the word 'systems'
   1. **str1.endswith(“systems”)**
2. Return a list of words from str2
   1. **str2.split()**
3. Convert str1 and str2 to all uppercase letters
   1. **str1.upper()**
   2. **and to store it str1 = str1.upper()**
   3. **str2.upper()**
   4. **and to store it str2 = str2.upper()**
4. Replace the string 'web' of str1 with an empty string
   1. **str1.replace(‘web’,’’)**
5. Count the number of times ‘e’ occurs in str2
   1. **str2.count(‘e’)**

**Part 3- Dictionary in Python:** Define the following *dicts*:

*#dictionary literals*

d1={"name": "Bob", "age": 35, (4, 10):['x', 'y', 'z'], '+1' : "Canada", 44: 99, 19:555}

*#dictionary using sequences*

d2 = dict([("name","Livy"), ('age', 44), ((1, 3, 5), ['a', 'b', 'c']), (0, 'black'), (33, 67)])

*#dictionary using keywords*

d3 = dict(id=2277, name='Michael', siblings=['Janet', 'Martin', 'Richard'])

***Work with dict methods***: Type the following commands at the Python prompt in IDLE interactive mode and indicate the result of each command:

1. d1.keys()
   * **dict\_keys(['name', 'age', (4, 10), '+1', 44, 19])**
2. d2.values()
   * **dict\_values(['Michael', 44, ['a', 'b', 'c'], 'black', 67, 2277, ['Janet', 'Martin', 'Richard']])**
3. d3.get('id')
   * **2277**
4. d2.get('age')
   * **44**
5. d3.get('age')
   * **==>Nothing, as no key as age**
6. d3.set('name', 'Tim')
   * **'Michael'**
7. d2.items()
   * **dict\_items([('name', 'Michael'), ('age', 44), ((1, 3, 5), ['a', 'b', 'c']), (0, 'black'), (33, 67), ('id', 2277), ('siblings', ['Janet', 'Martin', 'Richard'])])**
8. d3['siblings']
   * **['Janet', 'Martin', 'Richard']**
9. d2['siblings']
   * **KeyError: 'siblings'**
10. d2.update(d3)
    * **{'name': 'Michael', 'age': 44, (1, 3, 5): ['a', 'b', 'c'], 0: 'black', 33: 67, 'id': 2277, 'siblings': ['Janet', 'Martin', 'Richard']}**
11. d2[0]
    * **‘black’**
12. d1.get((1,2))
    * **No such tuple presents as a key in d1**
13. d2['siblings']
    * **['Janet', 'Martin', 'Richard']**
14. d2['name']
    * **'Michael'**
15. d1 == d2
    * **False**
16. len(d2)
    * **7**
17. for key in d1.keys():

print(key)

**name**

**age**

**(4, 10)**

**+1**

**44**

**19**

1. for key in d2.keys():

print(d2[key])

**Michael**

**44**

**['a', 'b', 'c']**

**black**

**67**

**2277**

**['Janet', 'Martin', 'Richard']**

**\****means after* update.