COMSATS University Islamabad, Wah Campus
Electrical & Computer Engineering Department

Lab Rubrics Evaluation sheet

Fall 2023

Program: BCS **Section: 7C**

Subject: Artificial Intelligence **Reg #: FA20-BCS-073, FA20-BCS-157**

Lab No: 02 **Name: Aleena Khan, Fatima Zamir**

Lab Instructor: Engr.Adnan Saleem Mughal **Date: September 27, 2023**

Title of experiment: Data types, Containers, Input/output, and Operators in Python

- **Objectives:**
  - The primary goal of this lab is to provide a foundational understanding of key Python programming concepts, including data types, containers (such as lists and dictionaries), input/output operations, and operators.
  - Participants will become familiar with these fundamental building blocks of Python.

- **Tools:**

  I have utilized Spyder.

LAB TASKS

Question No: 01

Write a Python program to sum all the items in a list.

Code:

```
items = [2, 10, 5, 4, 3]

Sum_of_Items = sum(items)
```

print("Sum of List Items = ", Sum_of_Items)

```
In [2]: runfile('C:/Users/Aleena/.spyde
Users/Aleena/.spyder-py3')
Sum of List Items =  24
```

Question No: 02

Write a Python program to get the largest number from a list.

Code:

list1 = [17, 50, 20, 83, 5]

largestNumber = max(list1)

print("largest Number in list is =", largestNumber)

```
largest Number in list is = 83

In [5]:
```

Question No: 03

Write a Python program to remove duplicates from a list

Code:

list2 = [14, 21, 2, 3, 14, 2, 5]

duplicates_removed = set(list2)

print("List without Duplicates:", duplicates_removed)

```
List without Duplicates: {2, 3, 5, 14, 21}
```

Question No: 04

Write a Python program to convert list to list of dictionaries.

Code:

```
student_names = ["Sadaf", "Ali", "Rabia", "Ibrahim"]

student_ids = ["1", "2", "3", "4"]

# Initialize an empty list to store dictionaries

studentInformationList = []

for i in range(len(student_names)):

    student_info = {'student_name': student_names[i], 'student_id': student_ids[i]}

    studentInformationList.append(student_info)

print(studentInformationList)
```

```
[{'student_name': 'Sadaf', 'student_id': '1'}, {'student_name':
'Ali', 'student_id': '2'}, {'student_name': 'Rabia', 'student_id':
'3'}, {'student_name': 'Ibrahim', 'student_id': '4'}]

In [10]:
```

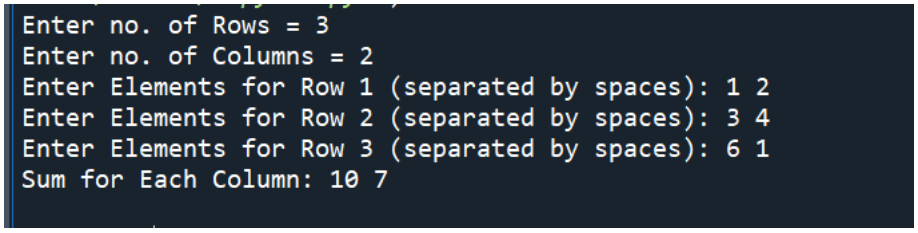
<u>Question No: 05</u>

Write a Python program to read a matrix from console and print the sum for each column. Accept matrix rows, columns and elements for each column separated with a space(for every row) as input from the user.

Code:

```
rows = int(input("Enter no. of Rows = "))

columns = int(input("Enter no. of Columns = "))
```

```
matrix = []

for i in range(rows):

    row = list(map(int, input(f"Enter Elements for Row {i + 1} (separated by spaces): ").split()))

    matrix.append(row)

sum_of_columns = [sum(col) for col in zip(*matrix)]

print("Sum for Each Column:", *sum_of_columns)
```



Question No: 06

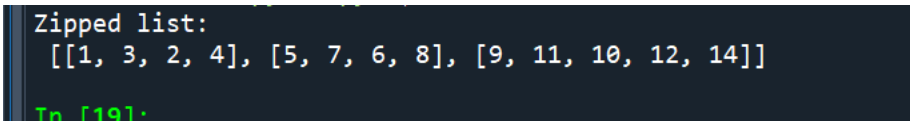
Write a Python program to Zip two given lists of lists.

Original lists: [[1, 3], [5, 7], [9, 11]][[2, 4], [6, 8], [10, 12, 14]]

Zipped list: [[1, 3, 2, 4], [5, 7, 6, 8], [9, 11, 10, 12, 14]]

Code:

```
first_list = [[1, 3], [5, 7], [9, 11]]

second_list = [[2, 4], [6, 8], [10, 12, 14]]

zipped_list = [x + y for x, y in zip(first_list, second_list)]

print("Zipped list:\n", zipped_list)
```



Question No: 07

Write a Python program to extract the nth element from a given list of tuples.

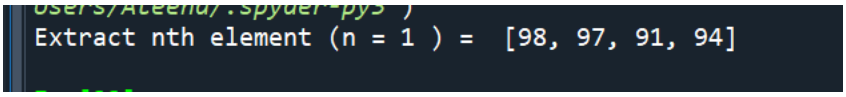
Original list: [('Greyson Fulton', 98, 99), ('Brady Kent', 97, 96), ('Wyatt Knott', 91, 94), ('Beau Turnbull', 94, 98)]

Extract nth element (n = 0) from the said list of tuples: ['Greyson Fulton', 'Brady Kent', 'Wyatt Knott', 'Beau Turnbull']

Extract nth element (n = 2) from the said list of tuples: [99, 96, 94, 98]

Code:

```
original_list = [('Greyson Fulton', 98, 99), ('Brady Kent', 97, 96), ('Wyatt Knott', 91, 94), ('Beau Turnbull', 94, 98)]
n = 1
extracted_list = [item[n] for item in original_list]
print("Extract nth element (n =", n,") = ", extracted_list)
```



<u>Question No: 08</u>

Write a Python program to remove additional spaces in a given list.

Original list: ['abc ', ' ', ' ', 'sdfds ', ' ', ' ', 'sdfds ', 'huy']

Code:

```
originalList = ['abc ', ' ', ' ', 'sdfds ', ' ', ' ', 'sdfds ', 'huy']
removed_spaces = [item.strip() for item in originalList]
print("Spaces Removed from the Original list:")
print(removed_spaces)
```

```
Spaces Removed from the Original list:
['abc', '', '', 'sdfds', '', '', 'sdfds', 'huy']
```

Question No: 09

Write a Python program to multiply all the items in a dictionary

Code:

```
dictionary_items = {'Monday': 1,'Tuesday': 2, 'Wednesday': 3, 'Thursday': 4, 'Friday': 5}
result = 1
for value in dictionary_items.values():
    result *= value
print("Multiplication of all Items of Dictionary = ", result)
```

```
Multiplication of all Items of Dictionary =  120
```

Question No: 10

Write a Python program to print all unique values in a dictionary.

Code:

```
colors = [{'Blue': "A001"},{'Orange': "A009"}, {'Black': "A002"}, {'Green': "A001"}, {'Pink':
"A005"}, {'Purple': "A005"}]
uniqueValues = set(value for item in colors for value in item.values())
print("Unique Values:\n", uniqueValues)
```

```
Unique Values:
 {'A009', 'A002', 'A001', 'A005'}

In [43]:
```

Question No: 11

Write a Python program to create a dictionary of keys x, y, and z where each key has as value a list from 11-20, 21-30, and 31-40 respectively. Access the fifth value of each key from the dictionary.

{'x': [11, 12, 13, 14, 15, 16, 17, 18, 19], 'y': [21, 22, 23, 24, 25, 26, 27, 28, 29], 'z': [31, 32, 33, 34, 35, 36, 37, 38, 39]}

15

25

35

x has value [11, 12, 13, 14, 15, 16, 17, 18, 19]

y has value [21, 22, 23, 24, 25, 26, 27, 28, 29]

z has value [31, 32, 33, 34, 35, 36, 37, 38, 39]

Code:

```
dictionary = {'x': list(range(11, 20)), 'y': list(range(21, 30)), 'z': list(range(31, 40))}
print(dictionary)
print("Fifth Value of each Dictionary:")
for key, values in dictionary.items():
    print(values[4])
```

```
{'x': [11, 12, 13, 14, 15, 16, 17, 18, 19], 'y': [21, 22, 23, 24,
25, 26, 27, 28, 29], 'z': [31, 32, 33, 34, 35, 36, 37, 38, 39]}
Fifth Value of each Dictionary:
15
25
35
```

Question No: 12

Write a Python program to print a tuple with string formatting.

Code:

```
tuple = (100, 200, 300)

print(f"This is a tuple {tuple}")
```

```
This is a tuple (100, 200, 300)
```

Question No: 13

Write a Python program to replace last value of tuples in a list.

Code:

```
tuples = [(12, 20, 37), (28, 57, 60), (41, 2, 13)]

newValue = 100

replaced_LastValue = [(x, y, newValue) for x, y, _ in tuples]

print("Tuples = ", tuples)

print("Last Values Replaced in lTuples = \n", replaced_LastValue)
```

```
Tuples =  [(12, 20, 37), (28, 57, 60), (41, 2, 13)]
Last Values Replaced in lTuples =
 [(12, 20, 100), (28, 57, 100), (41, 2, 100)]
```

Question No: 14

Write a Python program to find the elements in a given set that are not in another set.

Code:

```
set1 = {8, 2, 13, 4, 5}

set2 = {4, 17, 6, 5, 8}

result = set1.difference(set2)

print("Elements in set1 not in set2:", result)
```

```
Elements in set1 not in set2: {2, 13}
```

Question No: 15

Write a Python program to check a given set has no elements in common with other given set.

Code:

```
set1 = {11, 2, 34, 5, 6}
set2 = {43, 5, 6, 18}
if set1.isdisjoint(set2):
    print("The sets have no elements in common.")
else:
    print("The sets have some elements in common.")
```

```
The sets have some elements in common.

In [57]:
```

Question No: 16

Write a Python program that accept name of given subject and marks. Input number of subjects in first line and subject name, marks separated by a space in next line. Print subject name and marks in order of its first occurrence.

Code:

```
numberOfSubjects = int(input("Enter Number of Subjects: "))
marksOfSubject = {}
for _ in range(numberOfSubjects):
```

```
    subject, marks = input("Enter Subject Name and Marks (separated by a space): ").split()
    marksOfSubject.setdefault(subject, int(marks))
for subject, marks in marksOfSubject.items():
    print(subject, marks)
```