Assignment 1

Sp21-bcs-017 (Muhammad Haroon Shahzad)

Sp21-bcs-43 (Farhan Mehmood)

Introduction to Data Science SP2024

Marks 5

Due date: 08-March-2024 at 11:30 AM

**Question**:

**Important**: Go through the Python Programming Language tutorial such as <https://www.w3schools.com/python/> and create 10 nested data-structures using all of the following:

* Lists
* Tuples
* Dictionaries
* Sets

**Important**: Fill the data and print the output. Paste the code and screenshots in submission. Strictly not more than two students per submission. Only one submission per group is enough.

*#1. Lists within tuples*

cars=(["AUDI","BMW","TOYATA"],

      ["VOLVO","FORD","TESLA"],

      ["FERRARI","LAMBORGHINI","BUGATTI"])

print("The selected car is:",cars[1][2])

The selected car is: TESLA

*#2.List within Lists:*

coins=[

    {"Bigcoins":["BTC","ETH","SOL"]},

    {"Altcoins":["DOGE","SHIB","PEPE"]},

]

print("Alt coins are:",coins[1]["Altcoins"])

print("Selected coin is",coins[0]["Bigcoins"][1])

Alt coins are: ['DOGE', 'SHIB', 'PEPE']

Selected coin is ETH

*#3.tuples within tuples*

CoreSubjects=(("Artificial Intelligence","Computer Networks","Data Structures","Operating Systems"),

              ("Database Management Systems","Software Engineering","Web Development"),

              ("Computer Graphics","Computer Vision","Machine Learning"))

for x in CoreSubjects:

    for y in x:

     print(y)

Artificial Intelligence

Computer Networks

Data Structures

Operating Systems

Database Management Systems

Software Engineering

Web Development

Computer Graphics

Computer Vision

Machine Learning

*#4.List and Tuple within Lists:*

Students=[("Farhan","Ali",["Maths","Physics","Chemistry"]),

            ("Ali","Ahmed",["English","Urdu","Islamiat"]),

            ("Usman","Khan",["Biology","Computer","Statistics"])]

print("The subjects of Ali are:",Students[1][2])

The subjects of Ali are: ['English', 'Urdu', 'Islamiat']

*#5.tuples in sets*

Places={("India","USA","UK","Canada"),

         ("Australia","New Zealand","South Africa"),

         ("Brazil","Argentina","Chile")}

for x in Places:

   for y in x:

    print(y)

Australia

New Zealand

South Africa

India

USA

UK

Canada

Brazil

Argentina

Chile

*# Nested Dictionary*

nested\_dict = {

    'Farhan': {

        'Batch': 21-25,

        'age': 20,

        'grades': {

            'math': 90,

            'science': 85,

            'history': 88

        }

    },

    'Haroon': {

        'Batch': 21-25,

        'age': 22,

        'grades': {

            'math': 95,

            'science': 92,

            'history': 89

        }

    }

}

for subject, grade in nested\_dict['Farhan']['grades'].items():

    print(f"\t\t{subject}: {grade}")

math: 90

science: 85

history: 88

*# 7 Nested set*

nested\_set = {

    frozenset({'Lahore', 'Rawalpindi', 'Kasur'}),

    frozenset({'Karachi', 'Thatta'}),

    frozenset({'Quetta', 'Gawader', 'Ormara'})

}

*# Printing nested set*

print("\nNested Set:")

print("Set 1:", list(nested\_set)[0])

print("Set 2:", list(nested\_set)[1])

print("Set 3:", list(nested\_set)[2])

Nested Set:

Set 1: frozenset({'Ormara', 'Gawader', 'Quetta'})

Set 2: frozenset({'Rawalpindi', 'Kasur', 'Lahore'})

Set 3: frozenset({'Thatta', 'Karachi'})

*#8 Nested Dictionary with set*

nested\_dict\_with\_sets = {

    'Asia': {'Pakistan', 'China', 'Japan'},

    'Africa': {'South Africa', 'kenya', 'Rwanda'},

    'Europe': {'UK', 'Ireland', 'Itlay'}

}

print(nested\_dict\_with\_sets)

{'Asia': {'China', 'Pakistan', 'Japan'}, 'Africa': {'Rwanda', 'kenya', 'South Africa'}, 'Europe': {'UK', 'Ireland', 'Itlay'}}

*#9 Nested set with list*

nested\_set\_with\_lists = {

    frozenset({1, 2, 3}),

    frozenset({4, 5, 6}),

    frozenset({7, 8, 9})

}

print(nested\_set\_with\_lists)

{frozenset({1, 2, 3}), frozenset({4, 5, 6}), frozenset({8, 9, 7})}

*#10 Nested Dictionary with set and list*

mixed\_nested\_dict\_with\_sets = {

    'set\_dict1': {'set1': {1, 2, 3}, 'set2': {4, 5, 6}},

    'set\_dict2': {'set3': {7, 8, 9}, 'set4': {10, 11, 12}},

    'set\_dict3': {'set5': {13, 14, 15}, 'set6': {16, 17, 18}}

}

print(mixed\_nested\_dict\_with\_sets['set\_dict1']['set1'])

{1, 2, 3}

**Declaration:** I/We declare that:

1. I/We have created at least 50% of the answers by our own (not copied and without any help from any source).
2. I/We have executed the code at least once.
3. There are no bug/s in the code.
4. I/We understand the working of the code.

Signature/s:

Roll No./s: sp21-bcs-017 sp21-bcs-043.

**Answer**: (Code & screen shot/s of the execution & Architecture)