

NPTEL PYTHON FOR DATA SCIENCE

ASSIGNMENT SOLUTIONS (WEEK 2)

1. Package that deals with dataframe is

Answer C - Pandas

DataFrame in Python come with the Pandas library, and they are defined as two-dimensional labeled data structures with columns of different types

2. The data type of the following python object 'a' is

Answer C

Set in Python is a data structure equivalent to sets in mathematics and { } brackets are used to construct it

3. Command to convert 'a' from 'gOOd moRning' to 'Good Morning' is

Answer D – a.title()

```
In [9]: a='good morning'
```

```
In [10]: a.title()
```

```
Out[10]: 'Good Morning'
```

4. Which of the following python data structure is immutable?

Answer C

Though tuples may seem similar to lists, tuples are immutable, and usually contain a heterogeneous sequence of elements that are accessed via indexing or unpacking

5. Identify the braces used to create a dictionary in Python?

Answer B - { }

Use { } curly brackets to construct the dictionary

6. The command used to add elements to a *list*

Answer D - all of the above()

append() – add an item to the end of the list

extend() – extend the list by appending all the items from the iterable

insert() – insert an item at a given position.

Create a **Stationery** list with the below data

Prod = ['Pencil', 'Pen', 'Eraser', 'Pencil Box', 'Scale']

Price= [5, 10, 2, 20, 12]

Brand = ['Camlin', 'Rotomac', 'Nataraj', 'Camel', 'Apsara']

Stationery = [Prod, Price, Brand]

7. The command to add “Notebook” as the first element inside the first level of the list “**Stationery**” is:-

Answer B - Stationery[0].insert(0,'Notebook')

```
In [10]: Stationery[0].insert(0,'Notebook')
```

```
In [11]: Stationery
```

```
Out[11]:
```

```
[['Notebook', 'Pencil', 'Pen', 'Eraser', 'Pencil Box', 'Scale'],  
 [5, 10, 2, 20, 12],  
 ['Camlin', 'Rotomac', 'Nataraj', 'Camel', 'Apsara']]
```

```
- ----
```

8. Command to replace the element of Brand “Camel” with “Camlin” inside the list is:-

Answer C - Stationery[2][3] = "Camlin"

```
In [19]: Stationery[2][3] = "Camlin"
```

```
In [20]: Stationery
```

```
Out[20]:
```

```
[['Notebook', 'Pencil', 'Pen', 'Eraser', 'Pencil Box', 'Scale'],  
 [5, 10, 2, 20, 12],  
 ['Camlin', 'Rotomac', 'Nataraj', 'Camlin', 'Apsara']]
```

9. The list “**Months**” is defined as:-

```
Months = ['Jan', 'Mar', 'June', 'Aug', 'June', 'Feb', 'Nov', 'Dec', 'June', 'Apr', 'May', 'June']
```

Which of the following commands returns the number of occurrences of ‘June’

Answer A Months.count('June')

```
In [24]: Months = ['Jan', 'Mar', 'June', 'Aug', 'June', 'Feb', 'Nov', 'Dec', 'June', 'Apr', 'May', 'June']
```

```
In [25]: Months.count('June')
```

```
Out[25]: 4
```

10. Choose the correct command to sort them in ascending order

```
Ages = [ '20', '26', '56', '54', '32', '28', '23', '99', '87', '10', '65', '88', '66', '48', '42', '27', '33', '38', '83', '94', '66', '44']
```

Answer D Both A and B

```
In [17]: import numpy as np
```

```
In [18]: Ages=[20, 26, 56, 54, 32, 28, 23, 99, 87, 10, 65, 88, 66, 48, 42, 27, 33, 38, 83, 94, 66, 44]
```

```
In [20]: sorted(Ages, reverse=False)
```

```
Out[20]:
```

```
[10,
 20,
 23,
 26,
 27,
 28,
 32,
 33,
 38,
 42,
 44,
 48,
 54,
 56,
 65,
 66,
 66,
 83,
 87,
 88,
 94,
 99]
```

In [23]: Ages.sort()

Name	Type	Size	Value
Ages	list	22	[10, 20, 23, 26, 27, 28, 32, 33, 38, 42, ...]

Answer questions 11 and 12 using the information given below:

D = ['MONDAY', 'TUESDAY', 'WEDNESDAY', 'THURSDAY', 'FRIDAY', 'SATURDAY', 'SUNDAY']

11. The command to print **WEDNESDAY**, **THURSDAY** from the list “D” is

Answer A –

```
print(D[-5], D[-4])
```

```
In [52]: D=['MONDAY', 'TUESDAY', 'WEDNESDAY', 'THURSDAY', 'FRIDAY', 'SATURDAY', 'SUNDAY']
```

```
In [53]: print(D[-5], D[-4])
WEDNESDAY THURSDAY
```

12. The command used to reverse the above list “D” is:-

Answer Both B and C- D.reverse()

```
D=['MONDAY', 'TUESDAY', 'WEDNESDAY', 'THURSDAY', 'FRIDAY', 'SATURDAY', 'SUNDAY']
D.reverse()
```

D	list	7	['SUNDAY', 'SATURDAY', 'FRIDAY', 'THURSDAY', 'WEDNESDAY', 'TUESDAY', ' ...
---	------	---	--

```
D=['MONDAY', 'TUESDAY', 'WEDNESDAY', 'THURSDAY', 'FRIDAY', 'SATURDAY', 'SUNDAY']
list(reversed(D))
['SUNDAY', 'SATURDAY', 'FRIDAY', 'THURSDAY', 'WEDNESDAY', 'TUESDAY', 'MONDAY']
```

13. The command to clear all the elements from a *Set* is:-

Answer C - clear()

clear()-removes all the elements from an existing set

Answer questions 14 and 15 using the information given below:

Mylist=['a', 'a', 'b', 'b', 'b', 'c', 'c', 'd', 'e']

14. The output of the code: Mylist.index('d') is

Answer A – 7 (In Python indexing starts at 0)

15. The output after you run the command

Mylist.pop(0)

print(Mylist)

Answer B - ['a', 'b', 'b', 'b', 'c', 'c', 'd', 'e']

```
In [72]: Mylist =['a', 'a', 'b', 'b', 'b', 'c', 'c', 'd', 'e']
```

```
In [73]: Mylist.pop(0)
```

```
Out[73]: 'a'
```

```
In [74]: print(Mylist)
```

```
['a', 'b', 'b', 'b', 'c', 'c', 'd', 'e']
```

16. The command to find the number of elements in the following list “N”

N = [24, 27, 29, 26, 25, 23, 20]

Answer A - len(N)

```
In [78]: N = [24, 27, 29, 26, 25, 23, 20]
```

```
In [79]: len(N)
```

```
Out[79]: 7
```

Create a dictionary ‘Country’ that maps the following countries to their capitals respectively:

Country	India	China	Japan	Qatar	Australia
State	Delhi	Beijing	Tokyo	Doha	Sydney

17. The command to replace “Sydney” with “**Canberra**” is:-

Answer D- Both A and B

```
In [37]: Country={'India': 'Delhi', 'China': 'Beijing', 'Iran' : 'Tehran', 'Japan' :
'Tokyo', 'Malaysia' : 'Kualalumpur', 'Qatar' : 'Doha', 'Australia': 'Sydney'}
```

```
In [38]: Country['Australia']="Canberra"
```

```
In [39]: Country
```

```
Out[39]:
{'Australia': 'Canberra',
 'China': 'Beijing',
 'India': 'Delhi',
 'Iran': 'Tehran',
 'Japan': 'Tokyo',
 'Malaysia': 'Kualalumpur',
 'Qatar': 'Doha'}
```

```
In [41]: Country={'India': 'Delhi', 'China': 'Beijing', 'Iran' : 'Tehran', 'Japan' :
'Tokyo', 'Malaysia' : 'Kualalumpur', 'Qatar' : 'Doha', 'Australia': 'Sydney'}
```

```
In [42]: Country.update({"Australia": "Canberra"})
```

```
In [43]: Country
```

```
Out[43]:
{'Australia': 'Canberra',
 'China': 'Beijing',
 'India': 'Delhi',
 'Iran': 'Tehran',
 'Japan': 'Tokyo',
 'Malaysia': 'Kualalumpur',
 'Qatar': 'Doha'}
```

Create the following sets X1 and X2 using the data provided below and answer the questions 18 and 19

X1	9	5	6	3	7	8	1
X2	7	1	3	2	0	4	8

18. The output of X1.intersection(X2) will be

Answer B - {1,3,7,8}

```
In [86]: X1={9,5,6,3,7,8,1}
```

```
In [87]: X2={4,1,3,2,0,8,7}
```

```
In [88]: X1.intersection(X2)
```

```
Out[88]: {1, 3, 7, 8}
```

s

19. The command X1.symmetric_difference(X2)

Answer C - returns elements not common to both sets

```
In [36]: X1={9,5,6,3,7,8,1}
...: X2={4,1,3,2,0,8,7}
```

```
In [37]: X1.symmetric_difference(X2)
Out[37]: {0, 2, 4, 5, 6, 9}
```

20. Which of the following is a code template for creating objects in Python?

Answer D - Class

List, Set and Dictionary are Data Structures in Python while Class is code template

Create the following **Matrix “Y”** in Python and answer questions 21 to 23

4	9	6
2	8	4
5	10	15

21. The determinant of the matrix “Y” rounded off to the Zeroth decimal place is

Answer A -110

```
In [89]: Y = np.matrix("4,9,6;2,8,4;5,10,15")
```

```
In [90]: np.linalg.det(Y)
```

```
Out[90]: 110.00000000000004
```

22. Inverse of Matrix “Y” rounded off to second decimal place is

Answer B

```
In [91]: Z=np.linalg.inv(Y)
```

```
In [92]: np.matrix.round(Z,2)
```

```
Out[92]:
```

```
array([[ 0.73, -0.68, -0.11],  
       [-0.09,  0.27, -0.04],  
       [-0.18,  0.05,  0.13]])
```

23. The column sum of Y^T is

Answer C

```
In [93]: Y = np.matrix("4,9,6;2,8,4;5,10,15")
```

```
In [94]: Y=np.transpose(Y)
```

```
In [95]: np.sum(Y, axis=0)
```

```
Out[95]: matrix([[19, 14, 30]])
```