



Department of Computer Science and Engineering (Data Science)

S.Y. B.Tech. Sem: IV Subject: Statistics for Data Science

Experiment 0

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Date:	Experiment Title: Data Structures in Python
Aim	To study data types in Python and its functions.
Software	Google Colab : https://colab.research.google.com/github/SmayanKulkarni/AI-and-ML-Course/blob/master/SDS/EXP-0.ipynb
Implementation	<p>Question: Write a comment in Python. Code:</p> <pre>1 #this is a comment in python</pre> <p>Question: Write a multiline comment/paragraph in Python. Code:</p> <pre>1 """ 2 this is a multiline comment in python 3 """ '\nthis is a multiline comment in python\n'</pre> <p>Primitive Data Types</p> <p>Question: Write a program to print an integer, float, string, complex number, Boolean, and bytes in Python and display their data type. Code:</p> <pre>1 i = 5 2 print(i) 3 i = 234.12123 4 print(i) 5 str = "This is a string" 6 print(str) 7 x = 5 8 y = 3 9 print(complex(x, y)) 10 a = True 11 print(a)</pre> <pre>5 234.12123 This is a string (5+3j) True</pre>



Data Structures

Lists

Question: Write a program to create a list. Collect heterogeneous data in it.

Code:

```
1 heterogenous = [4,2,1,"this", True, [3,5,3,1]]
2 print(heterogenous)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1]]
```

Question: Write a program to print a list.

Code:

```
1 print(heterogenous)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1]]
```

Question: Write a program to print a new list. Append an item in this list.

Code:

```
1 heterogenous.append(34)
2 print(heterogenous)
```

```
[6]
```

```
... [4, 2, 1, 'this', True, [3, 5, 3, 1], 34]
```

Question: Write a program to make a copy of the previous list.

Code:

```
1 het = heterogenous.copy()
2 print(het)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34]
```

Question: Write a program to concatenate 2 lists and print the output.

Code:



```
1 list2 = het + heterogenous
2 print(list2)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34]
```

Question: Write a program to count the number of elements present in a list.

Code:

```
1 print(list2)
2 print("The length of the list is: ",len(list2))
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34]
The length of the list is: 14
```

Question: Write a program to print the length of a list.

Code:

```
1 print(list2)
2 print("The length of the list is: ",len(list2))
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34]
The length of the list is: 14
```

Question: Write a program to append more than 1 item in a list.

Code:

```
1 list2.extend([5,4])
2 print(list2)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4]
```

Question: Write a program to extend a list.

Code:

```
1 list2.extend([5,4])
2 print(list2)
```

```
[4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4]
```

Question: Write a program to insert a value at a position in a list.

Code:

```
1 list2.insert(4,3)
2 print(list2)
```

```
[4, 2, 1, 'this', 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5, 4]
```

Question: Write a program to delete a value at a given position in a list.

Code:

```
1 print(list2)
2 del list2[3]
3 print(list2)
```

[4, 2, 1, 'this', 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5, 4]
[4, 2, 1, 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5, 4]

Question: Write a program to remove a value from the list.

Code:

```
1 print(list2)
2 list2.pop()
3 print(list2)
```

[4, 2, 1, 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5, 4]
[4, 2, 1, 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5]

Question: Write a program to slice the data in a list.

Code:

```
1 print(list2[4:])
```

[True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5]

Question: Write a program to slice data in a list using positions.

Code:

```
1 print(list2[:8])
```

[4, 2, 1, 3, True, [3, 5, 3, 1], 34, 4]

Question: Write a program to print the last 8 elements.

Code:

```
[ ] print(lists[-8:])
```

➡ [1, 3, 4, 5, 6, 7, 8]

Question: Write a program to print the last value of a list.

Code:

```
1 print(list2[-1])
```

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Question: Write a program to print the central value of a list.

Code:

```
1 def find_middle_elements(arr):
2     result = []
3     n = len(arr)
4     if n % 2 == 0:
5         result.append(arr[n // 2 - 1])
6         result.append(arr[n // 2])
7     else:
8         result.append(arr[n // 2])
9
10    return result
11
12    middle = find_middle_elements(list2)
13    print(middle)
```

[2]

Tuples

Question: Write a program to create a tuple. Collect heterogenous data in it.

Code:

```
1 tup = ([1,2,3,4], "This is a string", 3,2,1)
2 print(tup)
```

0]

• ([1, 2, 3, 4], 'This is a string', 3, 2, 1)

Question: Write a program to print the position of an item in the tuple.

Code:

```
1 pos = tup.index("This is a string")
2 print(pos)
```

[21]

... 1

Question: Print a new tuple. Write a program to concatenate two tuples.
Code:

```
1 tup2 = (4,2,1,2,3)
2 ls = list(tup2)
3 # list2 = list(tup) + list(tup2)
4 tup = tuple(list2)
5 print(tup)
6
```

(4, 2, 1, 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5)

Question: Write a program to print the value at position 2 in the concatenated tuple.

Code:

```
1 print(tup.index(2))
```

[3]

1

Question: Write a program to change the element of a tuple.

Question: Write a program to change the element of a tuple.
Code:

```
1 ls= list(tup)
2 ls[2] = 234
3 tup = tuple(ls)
4 print(tup)
```

(4, 2, 234, 3, True, [3, 5, 3, 1], 34, 4, 2, 1, 'this', True, [3, 5, 3, 1], 34, 5, 4, 5)

Dictionary

Question: Write a program to create and print a dictionary.

Code:

```
1 print(dic["Name"])
```

Smayan

Question: Write a program to print values of a dictionary using keys.

Code:

```
1 print(dic["Name"])
```

Smayan

Question: Write a program to create a multidimensional dictionary.

Code:

```
1 dic2 = {"Id" : {"Name" : "smayan" }, "age" : 24}
2 print(dic2)
```

```
{'Id': {'Name': 'smayan'}, 'age': 24}
```

Question: Write a program to print values from the multidimensional dictionary using keys.

```
1 print(dic2)
2 print(dic2["Id"]["Name"])
```

```
{'Id': {'Name': 'smayan'}, 'age': 24}
```

smayan

Code:

If-Else Condition

Question: Brother is 12 years old. Sister is 15 years old. Write a program that prints who is older using if-else statement.

Code:

```
1 b = 12
2 s = 15
3 if(b>s): print("Brother is older than sister")
4 else : print("Sister is older than brother")
```

Sister is older than brother

Question: Take the input of ages from the user. Write a program that prints who is older using if-else statement.

Code:



```
1 b = input("Enter brothers age")
2 s = input("Enter sisters age")
3 if(b>s): print("Brother is older than sister")
4 else : print("Sister is older than brother")
```

Brother is older than sister

For Loop

Question: Write a program that prints the elements of a list using for loop.

Code:

```
1 for i in range(len(list2)):
2     print(list2[i])
```

```
4
2
1
3
True
[3, 5, 3, 1]
34
4
2
1
this
True
[3, 5, 3, 1]
34
5
4
5
```

Question: Write a program that enumerates and prints the elements of a list using for loop.


```
1 for i,val in enumerate(list2):  
2     print(val)
```

```
4  
2  
1  
3  
True  
[3, 5, 3, 1]  
34  
4  
2  
1  
this  
True  
[3, 5, 3, 1]  
34  
5  
4  
5
```

Code:

Functions

Question: Write a program to create a function.

Code:

```
1 def func():  
2     print("This does absolutely nothing")  
3  
4 func()
```

```
This does absolutely nothing
```

Question: Create a function that adds two numbers.

Code:

```
1 def add(x,y):  
2     return x+y  
3 a = add(4,3)  
4 print(a)
```

Question: Create a function that adds two numbers. Take input from the user.

Code:

```
1 a = int(input("Enter a number"))
2 b = int(input("Enter a number"))
3 c = add(a,b)
4 print(c)
```

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Question: Create a function that adds two strings. Take input from the user.

Code:

```
1 def adstr(s1,s2):
2     return s1+s2
3
4 s3 = adstr("This is str1 ", " This is str2")
5 print(s3)
```

This is str1 This is str2

Sets

Question: Write a program to create and print a set.

Code:

```
1 s = {3,2,1,4,2}
2 print(s, type(s))
```

```
{1, 2, 3, 4} <class 'set'>
```

Question: Write a program to print a set with duplicate values.

Code:



	<pre>1 """ 2 It is not possible to do this function in python 3 """ '\nIt is not possible to do this function in python\n'</pre> <p>Question: Write a program to print the length of a set. Code:</p> <pre>1 print(len(s)) 40] .. 4</pre> <p>Question: Write a program to create a set and print its data type. Code:</p> <pre>1 s = {3,2,1,4,2} 2 print(s, type(s)) {1, 2, 3, 4} <class 'set'></pre> <p>Question: Write a program to check if a set takes duplicate values with different capitalization/formatting. Code:</p> <pre>1 se = {"Yes", "yes", "it", "is pssible "} 2 print(se) {'is pssible ', 'Yes', 'yes', 'it'}</pre>
Conclusion	Hence, we have studied and implemented data structures in Python.

Signature of Faculty