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| Experiment No. 3 |
| To explore basic data types of python like strings, list, dictionaries and tuples |
| Date of Performance:08/02/24 |
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Experiment No. 3

Title: To explore basic data types of python like strings, list, dictionaries and tuples.

Aim: To study and explore basic data types of python like strings, list, dictionaries and tuples.

Objective: To introduce basic data types of python

Theory:

Lists: are just like dynamic sized arrays, declared in other languages (vector in C++ and ArrayList in Java). Lists need not be homogeneous always which makes it a most powerful tool in Python.

Tuple: A Tuple is a collection of Python objects separated by commas. In some ways a tuple is similar to a list in terms of indexing, nested objects and repetition but a tuple is immutable unlike lists that are mutable.

Set: A Set is an unordered collection data type that is iterable, mutable and has no duplicate elements. Python's set class represents the mathematical notion of a set.

Dictionary: in Python is an unordered collection of data values, used to store data values like a map, which unlike other Data Types that hold only single value as an element, Dictionary holds key:value pair. Key value is provided in the dictionary to make it more optimized.



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List, Tuple, Set, and Dictionary are the data structures in python that are used to store and organize the data in an efficient manner.

| List | Tuple | Set | Dictionary |
|--|--|---|--|
| List is a non-homogeneous data structure which stores the elements in single row and multiple rows and columns | Tuple is also a non-homogeneous data structure which stores single row and multiple rows and columns | Set data structure is also non-homogeneous data structure but stores in single row | Dictionary is also a non-homogeneous data structure which stores key value pairs |
| List can be represented by [] | Tuple can be represented by () | Set can be represented by { } | Dictionary can be represented by { } |
| List allows duplicate elements | Tuple allows duplicate elements | Set will not allow duplicate elements | Set will not allow duplicate elements but keys are not duplicated |
| List can use nested among all | Tuple can use nested among all | Set can use nested among all | Dictionary can use nested among all |
| Example: [1, 2, 3, 4, 5] | Example: (1, 2, 3, 4, 5) | Example: {1, 2, 3, 4, 5} | Example: {1, 2, 3, 4, 5} |
| List can be created using list() function | Tuple can be created using tuple() function. | Set can be created using set() function | Dictionary can be created using dict() function. |
| List is mutable i.e we can make any changes in list. | Tuple is immutable i.e we can not make any changes in tuple | Set is mutable i.e we can make any changes in set. But elements are not duplicated. | Dictionary is mutable. But Keys are not duplicated. |
| List is ordered | Tuple is ordered | Set is unordered | Dictionary is ordered |



Creating a set

a=set()

Creating an empty
list

l=[]

Creating an empty
Tuple

t=()

b=set(a)

CODE:

```
list = ["apple", "ball", "cat"]
print(list)
list.pop(1)
print(list)
list.append("dog")
print(list)

tuple = ("lag", "bag", "zag")
print(tuple)

dictionary = {"apple": "4", "ball": "2"}
print(dictionary)

set1 = {"apple", "ball", "cat"}
print(set1)
```



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output:

A screenshot of a Python IDE (likely PyCharm) with a dark theme. The top toolbar shows icons for file operations, running, and debugging. The 'Project' view on the left shows a project named 'python' with a file 'main.py'. The 'Run' view at the bottom shows the output of the program. The code in 'main.py' is as follows:

```
6 print("this is the list",list)
7 tuple=('apple','banana')
8 print("This is the tuple",tuple)
```

The output in the 'Run' view is:

```
C:\Users\student\PycharmProjects\python\.venv\Scripts\python.exe C:\Users\student\PycharmProjects\python\main.py
['apple', 'banana', 'grapes']
This is the list ['apple', 'banana']
This is the list ['apple', 'banana', 'orange']
This is the tuple ('apple', 'banana')
This is the set {'1', '2'}
This is the dictionary {'apple': 1, 'banana': 2}

Process finished with exit code 0
```

The status bar at the bottom indicates the file encoding is UTF-8, the line ending is CRLF, and the Python version is 3.11.

Conclusion:

Basic data types of python has been studied and implemented.