COMPUTING FUNDAMENTALS USING PYTHON

Ms. Archana A
Assistant Professor

Department of Computer Applications

COMPUTING FUNDAMENTALS USING PYTHON

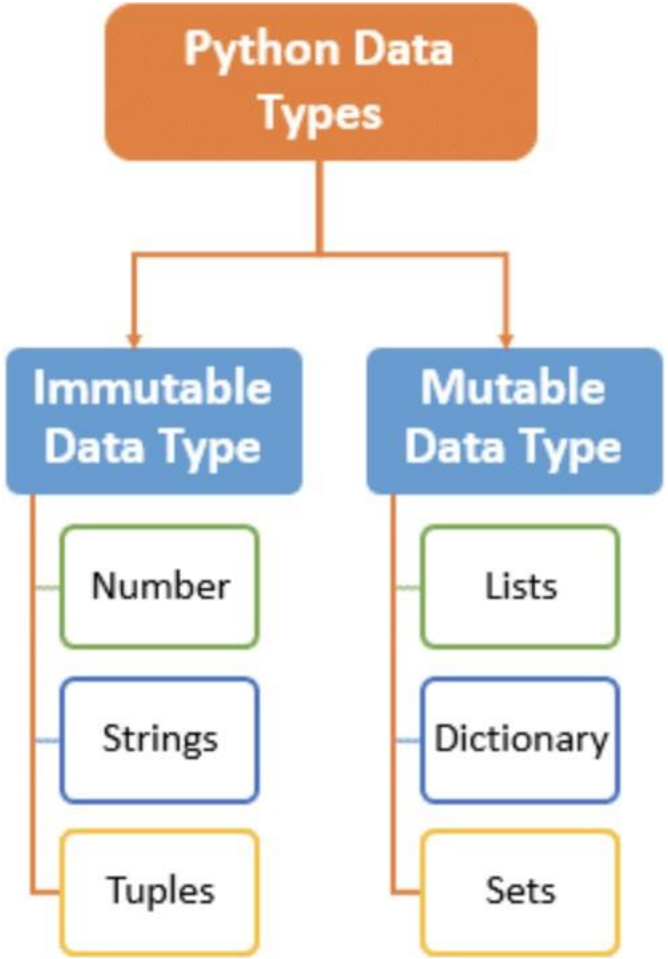
Python Basics Data Types
- List, Tuple, Set, Dictionary

Archana A
Computer Applications

COMPUTING FUNDAMENTALS USING PYTHON

Datatypes

1) Numbers
2) List
3) Tuple
4) Strings
5) Set
6) Dictionary



Data types - Lists

- List is an **ordered sequence of items.**
- It is one of the most used datatype in Python and is very flexible.
- All the items in a list **do not** need to be of the same type.
- Declaring a list is pretty straight forward.
  - **Items separated by commas** are enclosed within brackets **[ ].**

```
a = [1, 2.2, 'python']
```

Data types - Lists

- We can use the **slicing operator [:]** to extract an item or a range of items from a list. The index starts from 0 in Python

```
a = [5,10,15,20,25,30,35,40]

# a[2] = 15
print("a[2] = ", a[2])

# a[0:3] = [5, 10, 15]
print("a[0:3] = ", a[0:3])

# a[5:] = [30, 35, 40]
print("a[5:] = ", a[5:])
```

Output

```
a[2] =  15
a[0:3] =  [5, 10, 15]
a[5:] =  [30, 35, 40]
```

Data types - Lists

- Lists are **mutable** meaning, the **value of elements of a list can be altered**
- For example:

```
a = [1, 2, 3]
a[2] = 4
print(a)
```

Output

```
[1, 2, 4]
```

COMPUTING FUNDAMENTALS USING PYTHON

Data types - Tuples

- Tuple is an ordered sequence of items same as a list. The only difference is that tuples are **immutable**. Tuples once created cannot be modified.

- Tuples are used to write-protect data and are usually faster than lists as they cannot change dynamically.

- It is defined within parentheses () where items are separated by commas.

```
t = (5,'program', 1+3j)
```

COMPUTING FUNDAMENTALS USING PYTHON

Data types - Tuples

```
t = (5,'program', 1+3j)

# t[1] = 'program'
print("t[1] = ", t[1])

# t[0:3] = (5, 'program', (1+3j))
print("t[0:3] = ", t[0:3])

# Generates error
# Tuples are immutable
t[0] = 10
```

Output

```
t[1] =  program
t[0:3] =  (5, 'program', (1+3j))
Traceback (most recent call last):
  File "test.py", line 11, in <module>
    t[0] = 10
TypeError: 'tuple' object does not support item assignment
```

COMPUTING FUNDAMENTALS USING PYTHON

Data types - Sets

- Set is an **unordered collection of unique items**.
- Set is defined by values separated by comma inside braces **{ }**.
- Items in a set are not ordered.

COMPUTING FUNDAMENTALS USING PYTHON

Data types - Sets

```
a = {5,2,3,1,4}

# printing set variable
print("a = ", a)

# data type of variable a
print(type(a))
```

Output

```
a =  {1, 2, 3, 4, 5}
<class 'set'>
```

COMPUTING FUNDAMENTALS USING PYTHON

Data types -- Dictionary

- Dictionary is an unordered collection of **key-value pairs**.

- It is generally used when we have a huge amount of data. Dictionaries are optimized for retrieving data. We must know the key to retrieve the value.

- In Python, dictionaries are defined within braces {} with each item being a pair in the form **key:value**. Key and value can be of any type.

```
>>> d = {1:'value','key':2}
>>> type(d)
<class 'dict'>
```

PES UNIVERSITY

THANK YOU

Ms. Archana A
Assistant Professor
Department of Computer Science
archana@pes.edu
+91 80 6666 3333 Extn 392