**Data Structures and Data Types**

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* If you’re learning Python from multiple sources, you might encounter the terms data structures and data types being used interchangeably.
* \*\*Definition: \*\*Data structure is a general computer science concept. Its definition reads as follows on Wikipedia:
* **Data structure is a data organization, management, and storage format that enables efficient access and modification.** More precisely, a data structure is a collection of data values, the relationships among them, and the functions or operations that can be applied to the data.
* Whereas Data type is a concept specific to a programming language. In a way, it is a concrete implementation of a data structure in a particular programming language (be it python or any other language).
* \*\*The actual definition of what constitutes a "type" varies among programming languages. \*\*Talking about Python, there are basic data types like int, float, string etc. You can use the built-in types like list, set etc. which we will be covering in this session.
* Calling these data types as data structures won’t be wrong because there is no major difference between the two in Python.

**Data Types in Python**

* Before we proceed to discuss what data types in Python are, there are some basic questions that we would discuss.\*\* What is data? \*\*\

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* Let’s say you are going to meet a friend at her office. When you go to visit her office, the security guard asks you to make an entry in the register before you enter the office. A typical entry register asks for the following information –

**Visitor's name**

**Karen**

**Visitor's phone number**

**32 000 000**

**Visitor's address**

**Leuven**

**Entry time**

**8:30 AM**

* The above information that you just provided is data. \
* We see that the data entry in the previous slide has different varieties:
  + Some are english letters,
  + Some are numerical digits, and
  + There are some special characters, dash (-) and colon ( : ).
  + In this example, our data is divided into 4 categories – name, phone number, address, and time.
  + This\*\* categorization of data\*\*,\*\* **based on their characteristic & our need,** **is called** data types.\*\*\

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* Some of the data types in python include:
  + Integer: whole numbers, positive or negative numbers. Eg: 100
  + Float: Floating-point numbers are real numbers, rational or irrational. In most cases, this means numbers with decimal fractions. Example: 123.45

String: Strings are sequences of characters, or text, enclosed in quotes. Example: "any text", “karen”\

* For further reading\*\*:\*\*
  + ​[operators and data types](https://www.dummies.com/programming/python/python-all-in-one-for-dummies-cheat-sheet/)​
* For practice and different data type examples, visit: <https://www.w3schools.com/python/python_datatypes.asp>​

**Getting the Data Type**

You can get the data type of any object by using the type( ) function:

* \*\*Numerical Types: \*\*int (integer), float (decimal)
* \*\*Text Type: \*\*str (string)
* **Boolean Type:** bool (True or False)

