*Python Program*ming
Data types and variables

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Is Data the new Oil of the Digital Economy?

- Your personal info
  - Age
  - Name
  - Current Job
  - Address
  - Mobile Number
- Your sharing
  - Images, videos, posts
- Your connections / interactions
- A lot of data!
  - What is the **data type**?!

Data type: We vs Programming

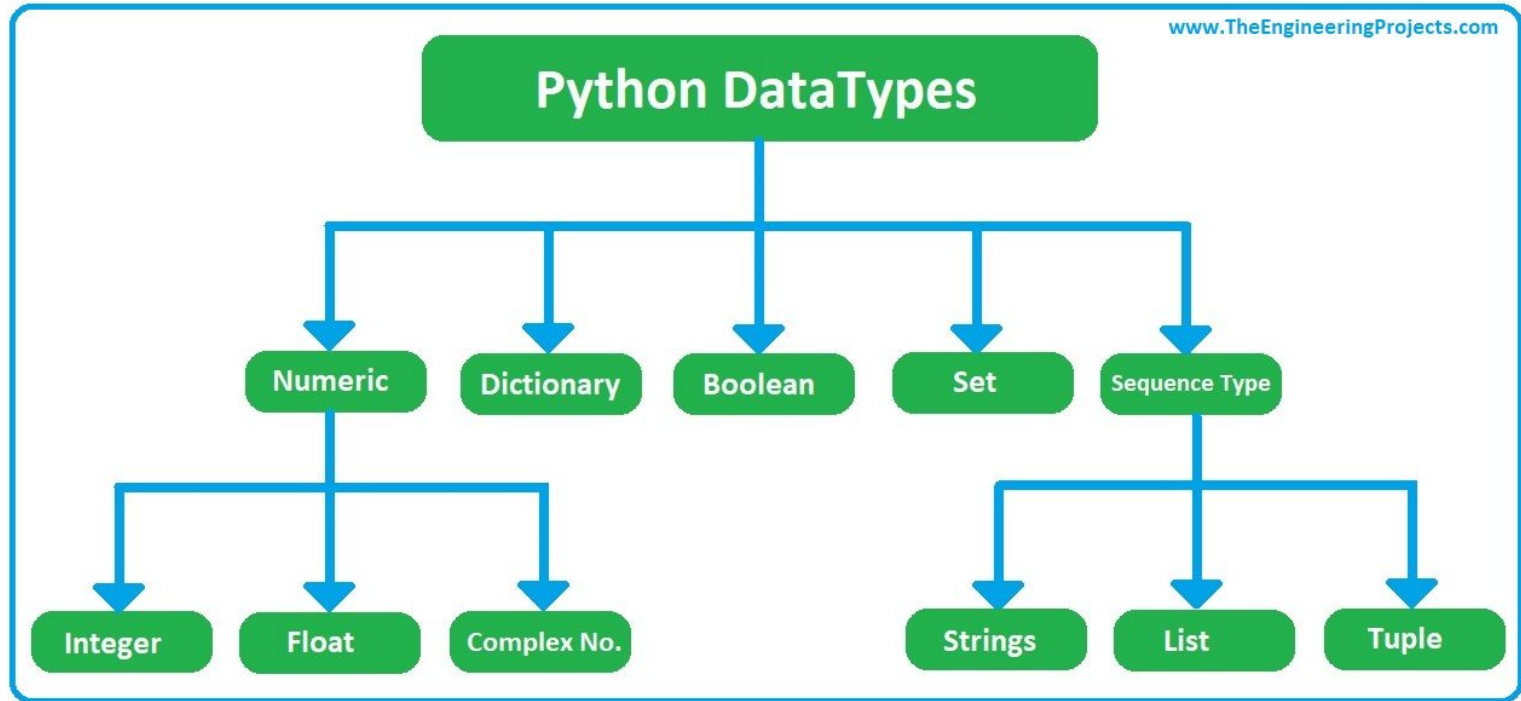| Value	We call it	Data Type
52 *(I am 52 years old)*	Number	Integer
12.**7** *(The baby is 12.7 kg)*	Number	Floating point
Computer	Word	String / Sequence of characters
Male of Female?	Status of 2 things	Boolean (2)

Data types: integer, floating point, string

- integer
  - 10, 200, 100, 200, 1000000
- Floating point (has .)
  - 10.5, 200.0, 2000000.1
- String
  - 'Hello', "World", '2000', "3000", 'مرحبا'

Data type: Boolean

- Some things are of two types only. E.g. a person is Male of Female?
  - Programmers call them **boolean**. Their values are true or false
  - E.g. Male is True, Femail is False (or the opposite)
  - E.g. coin is head or tail. We can think head is true and tail is false
  - E.g. Light can be on or off. Computers "understand" on and off.
    - On = True
    - Off = False

More data types later

The need for names!

- Let say we want to build a program for hospital
  - We need to refer to patients
  - One of them is called "Mostafa". He is 55 years old. He has 2 children!
  - We also has a Doctor: who has name, salary, address, etc
- How can we represent this information?
  - We need to put them in memory when the program starts
  - We need to have names to **refer** to them?
  - E.g. I want to know mostafa's age?

Computer Memory Like Streets

- Each home has street address (location)
  - Name and number
  - 37 John Street
  - 37 = location
  - John = Name
- There are people in the home
  - People have types
    - Male, Femal, Child

Img

Computer Memory (RAM)

- Think of it as boxes
- Each box has
  - Address location
  - Type (e.g. integer or floating point)
  - Name: E.g. age, name or salary
- We call it **variable**
  - A box in the memory

Location	Name/Value	Data Type
1	EMPTY	NA
2	**Age = 55**	Integer
3	**Weight = 92.5**	Floating point
4	**Gender = Male**	Boolean
5	**Name = "Mostafa"**	String

Memory

So

- Age = 52
- Variable
    - **Name** (aka identifier) = Age
    - **Value** = 52
    - **Datatype** = Integer
    - **Memory address** = Somewhere in RAM

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."