# Python Variables Python Datatypes
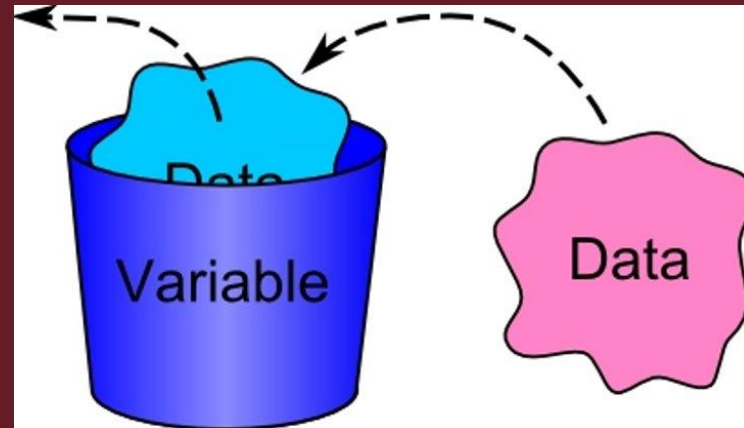
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# Python Variables

- What is a variable

- Variable naming convention

- Single variable assignment

- Multiple variable assignment

- Local and Global variables

- Global Keyword

- Conversion function

# What is a variable

- Reserved location in memory to store data
- Python takes care of creating memory when variable is created

# Variable naming convention

- Variable name cannot start with number.

- Variable name can start with letter or underscore character
  - A-Z, a-z,_ but cannot start with number or other characters

- Variable name can contain alphanumeric and underscore
  - A-Z,a-z,0-9,_

- Variable are case sensitive
  - MyNumer = 10 is not same as mynumber = 30

# Single variable assignment & Mulitple variable assignment

- my_first_var=12

- a=b=c=12

- Var1,var2,var3='we','have','three variables'

# Python Local variable vs global variable

- Local variable are declared inside the function cannot be used outside of function.

- Global variables are declared outside the function, we can use the global variable even inside the function.

# Global keyword

- All function variables are local by default

- We don't have to use global keyword when variable is out the functions

- We can only read the global variable inside the function  but cannot change the value, to do that we have to define global keyword to variable.

# Type conversion functions

**Convert one data type to another data type**

**Types**

- Implicit type conversion
  - Interpreter automatically converts without user involvement
- Explicit type conversion
  - User/developer converts from one datatype to other using default python functions

# Python Datatypes

1. Python has built-in data types
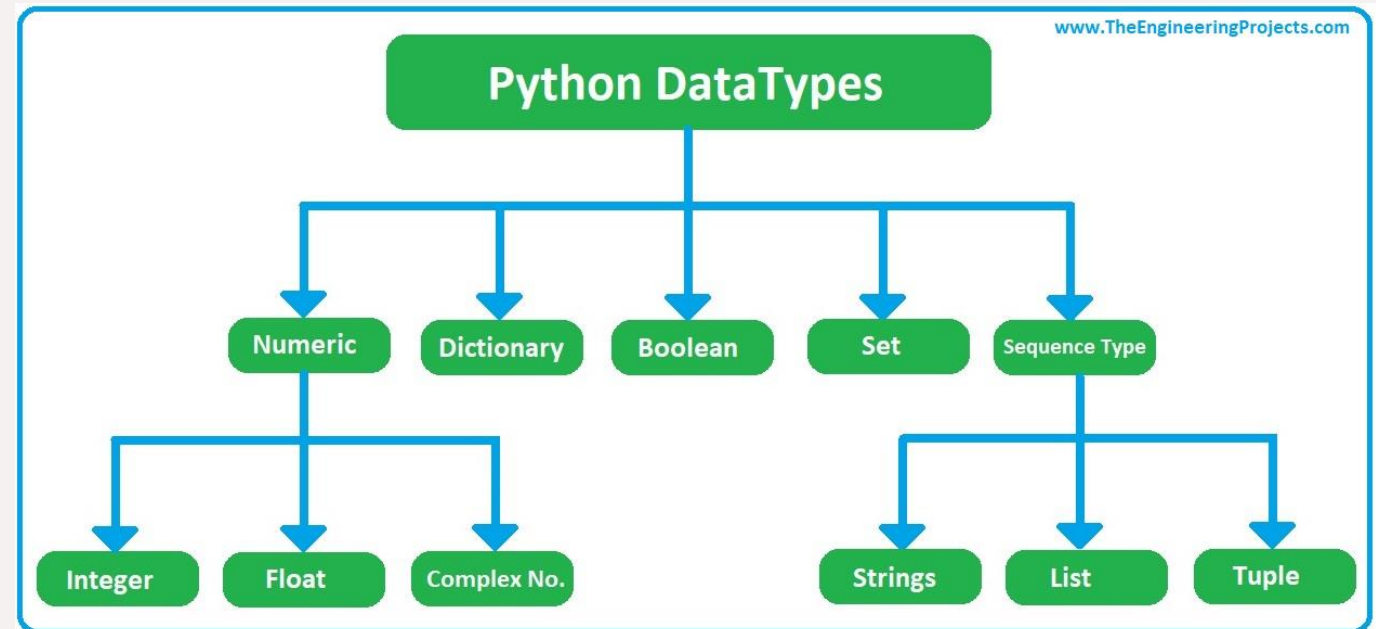   - Boolean
   - Mapping - dict
   - Text – string
   - Sequence
     - List, tuple, range
   - set
   - Numeric
     - Int, float, complex
2. Variable holds data
3. Variable is categorized based on datatype
4. We don't have to specify datatype in python as a part of variable declaration.
5. Python datatype doesn't have max size we give large data till our memory can hold.

# Numeric datatypes

**Int –**
- All whole numbers fall under integer e.g., -2,-1,0,1,2,..
- Max size of integer depends on the size of memory

**Float –**
- Floating point numbers are decimal numbers
- It includes both positive and negative e.g., -2.234,0.4356,1.1234445
- Decimal value is accurate upto 15 digits

**Complex -**
- Used in electricty applications
- Complex number contains real and imaginary number
- e.g., 10+2j

# Boolean datatype

Boolean is defined by keywords True or False

If int, float, complex variables value as 0 then bool type function always retuns False

If int, float, complex variables value as positive/negative then bool type function always retuns True

# Sequence datatype

- List -
  - Using single variable name we can store multiple/collection of data with different datatypes
  - It allows duplicate values
  - Any datatype combination can be placed inside the list
  - List is changeable (can add , modify and delete values from list)
- Tuple -
  - Tuple has all properties of list except tuple has immutability feature.

# Sequence Datatype

- String –
  - A sequence of characters
- String content is placed between single or double quotes
- Machine memory is your maximum size of the string variable

# references

- https://kevinavignon.com/2014/11/18/programming-basics-variables/

- https://www.theengineeringprojects.com/2020/06/how-to-use-data-types-in-python.html