

## STUDY GUIDE

# DATA TYPES IN PYTHON

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## Key Terms and Definitions

- » **Python:** One of the most popular programming languages for data science.
- » **REPL (Read, Evaluate, Print, Loop):** Allows the user to type and evaluate one line at a time. It reads the user's input, evaluates it, prints the output, then loops back to prompting the user for input.
- » **Python Enhancement Protocols (PEPs):** Documents that explain the "why" behind each new Python feature. A new PEP must be written for the community to consider a new feature.
- » **Expression:** Any valid piece of code that evaluates to something.
- » **Operators:** Pieces of Python code that act on one (unary operators) or two (binary operators) objects and evaluate to a single object. Some examples include:
  - **=:** The assignment operator, which associates a name with a value to create a variable. It is not a comparison, it's a definition.
  - **[]:** The indexing operator used to get a particular part of the variable (a character in a string, item in a list, etc.).
  - **==:** The comparison operator, which tests whether two objects are identical and evaluates to either True or False.
  - **%:** The modulus operator, which returns the remainder of the division of two objects.
- » **Data Types:** Indicators of how a computer should evaluate a particular object. For example, the same binary sequence (set of 1s and 0s) can evaluate to either a number or letter, depending on its type. The complete list of Python's built-in data types is: none, Booleans, numbers (int/float/long/complex), strings, lists, tuples, sets, and dictionaries.
- » **Primitive Data Types:** Data types that are single objects and are immutable (cannot be changed without being redefined). These are:
  - *Integers:* Whole numbers (with an optional + or - prefix).
  - *Floats:* Decimal numbers (formally called floating point numbers).
  - *Booleans:* Also called flags; these can only be True or False.
  - *Strings:* Sequences of characters, always enclosed in quotation marks.
- » **Constructor:** A built-in function of Python data types that assists with creation or conversion of these objects.
- » **Objects:** Everything in Python is an object, which is just a particular grouping of functions and variables.

- » **Methods:** Functions that "belong to" an object and act on its variables.
- » **Attributes:** The variables within an object.
- » **Indexing:** Referencing a character or item within an object. Python uses zero-based indexing, which means the first item is referenced by index 0 and the last by one less than the number of characters.

## Guiding Questions

1. Why must strings be enclosed in quotation marks?
2. Why are "primitive" data types named as such?
3. If you are thinking about a car as an "object," what would be some of its methods? Attributes?

## Additional Resources

1. [DataCamp: Intro to Python for Data Science](#)
  - » Section 1: "Python Basics." Specifically, see the parts on "variable types" onward.