Data Types

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Data Types

A variable can store data, which has a specific type.

- Built-In Data Types:
  - Known by the Python robot by default.
- Customized Data Types:
  - Designed by software engineers like you.

Built-In Data Types

- Simple Data Types
  - integer, float, boolean, string, and etc.
- Complex Data Types
  - list, set, dict, and etc.

type()

If you want to know the type of data or data stored in a variable, use `type()`.

```
type("here")
type(29)
type(1.3)
type(True)
```

Let me know your outputs.

type()

If you want to know the type of data or data stored in a variable, use `type()`.

```
a = "here"
type(a)
a = 29
type(a)
a = 1.3
type(a)
a = True
type(a)
```

Let me know your outputs.

Types

- **Int**, or integer, is a whole number, positive or negative, without decimals, of unlimited length.
- **Float**, or "floating point number" is a number, positive or negative, containing one or more decimals.
- **Booleans** represent one of two values: True or False.
- **Strings** in python are surrounded by either single quotation marks, or double quotation marks.

Two Important Questions

- What data types matter?
  - The same operation may have different effectiveness with different data types.
  - Certain operations make sense only if they are applied on data with specific types.
- Can we convert one data type to another one?
  - Yes to some of them.

Data Types Matter for Operators

Let's give a look at `+`

```
a = 1
b = 2
c = a + b
print(c)
```

```
a = "1"
b = "2"
c = a + b
print(c)
```

Data Types Matter for Operators

Let's give a look at `*`

```
a = 1
b = 2
c = a * b
print(c)
```

```
a = "1"
b = "2"
c = a * b
print(c)
```

Convert Data Types

A more professional way to say "data type converting" is **casting**!

Python Casting

```
x = int(1)   # x will be 1
y = int(2.8) # y will be 2
z = int("3") # z will be 3
```

Python Casting

```
x = float(1)     # x will be 1.0
y = float(2.8)   # y will be 2.8
z = float("3")   # z will be 3.0
w = float("4.2") # w will be 4.2
```

Python Casting

```
x = str("s1") # x will be 's1'
y = str(2)    # y will be '2'
z = str(3.0)  # z will be '3.0'
```

More Discussion

- Boolean
- String