IBM Data Analytics

Course 4: Python for Data Science & AI

Data Types

Q: What are four data types we see in Python?

DATA TYPES IN PYTHON

1. **Integer (Int)**

   A positive or negative whole number

2. **Float**

   A decimal number

3. **String (Str)**

   A single letter, word, or phrase enclosed by double quotation marks

4. **Boolean (Bool)**

   Has two possible values

Q: What are some examples of each data type?

DATA TYPES IN PYTHON

1 Integer (Int)

A positive or negative whole number

Examples:
12, 10, 11000

2 Float

A decimal number

Examples:
13.2, 44.5, 0.01

3 String (Str)

A single letter, word, or phrase enclosed by double quotation marks

Examples:
- “Peter”
- “A”
- “He is kind”

4 Boolean (Bool)

Has two possible values

Two values:

True
False

Type()

→ You can use the command **type()** to help you identify the type of data you're working with.

EXAMPLE:

Consider the four elements in the dataset: **[12.1, 14, "Banana", True]**.

If you wanted to check the data type of each element in the dataset, you would perform the following commands:

1) **type(12.1)**
2) **type(14)**
3) **type("Banana")**
4) **type(True)**

RESULT

type(12.1): float
type(14): int
type("Banana"): str
type(True): bool

Converting data from one type to another

→ In Python, when you convert one type of data to another, it is referred to as "**casting**"

You can cast an **integer** ---> **float**

Example: **float(12): 12.0**

You can also cast an **integer** ---> **str**

Example: **str(44): "44"**

Q: Can we cast a float to an int? Why or why not?

A: We can cast a float to an int, but the float will lose some of its value

Example float ---> integer

int(16.5): 16

***Notice how we lose 0.5 when we make the conversion**

Q: Can we cast a float to a string? Why or why not?

A: Yes, we can cast a float to a string

Example	**float ---> string**
Example:	**str(134.6): "134.6"**

Converting strings to integers

→ **A string that contains an integer can be casted to an integer**

Example:

string ---> integer

int('10'): 10

→ **A string that contains a non-integer value cannot be casted to an integer**

Example:

string ---> integer

int('GOAT'): ERROR

Converting boolean terms to integers

→ Recall that there are two possible boolean terms: **True** and **False**

where
→ **True** is equivalent to the integer **1**
→ **False** is equivalent to the integer **0**

Example:

boolean ---> integer

int(True): 1

Example:

boolean ---> integer

int(False): 0

Converting integers to boolean terms

→ Recall that there are two possible boolean terms: **True** and **False**

where
→ **True** is equivalent to the integer **1**
→ **False** is equivalent to the integer **0**

Example:

integer ---> boolean

bool(1): True

Example:

integer ---> boolean

bool(0): False

Question:

What would the output of the following input be?

int(true): _____

int(false): _____

Answer:

What would the output of the following inputs be?

int(true): ERROR
int(false): ERROR

WHY?

Answer:

What would the output of the following inputs be?

int(true): ERROR
int(false): ERROR

int(True): 1
int(False): 2

***Recall that each boolean term begins with a capital. Therefore, ‘true’ would need to be corrected to ‘True.’ Similarly, ‘false’ would need to be corrected to ‘False’**