

Variable Types

Textbook

Variable Types

Foundation

You may remember that some of the [variables](#) we created in previous sections had quotations around them. This is because not all variables are of the same data type.

Data types

[Data types](#) are [attributes](#) which tell the computer how you plan on using the variable. For example, a variable named `first_name` is most likely going to hold a word, someone's name, and not a number.

Below we will go through some different data types.



String

- [string](#): A string is a text value. By wrapping a variable's value in quotes, you create a string. Either single quotes `'Hello'` or double quotes `"Hello"` can be used. Both are valid strings.

```
name = "Parker"
```

```
name = 'Parker'
```

Integer

- [int](#): This is short for integer and does not need quotation marks. *There are two other ways to declare numbers which will be explained in the next lesson.*

```
age = 24
```

Boolean

- [boolean](#): You can also assign the value to be True or False. *Note: the first letter of True and False MUST be capitalized in Python.*

```
name = True
```

```
name = False
```

Null

The `None` keyword is used to define a null value, or no value at all.

For example.

```
total = None
```

This is not the same as 0. Zero is an integer, whereas None is just nothing. This is used to create an empty variable.

Printing Data Types

Sometimes it's hard to tell which data types are being shown in the console.

```
1 example = 34
2 example2 = "34"
3 print(example)
4 print(example2)
```

Try it!

This will print out `34 34`. They look the same, but one is an integer and another is a string. This differentiation will be VERY very important in upcoming lessons! Make sure you keep your data types straight as you program!

Another example

```
1 example = True
2 example2 = "True"
3 print(example)
```

```
4 print(example2)
```

Try it!

This will print out `True True`. Again, they look the same but one is a string and one is a Boolean.

Review

What kind of data type is this? `43`

[Show answer/example](#)

What kind of data type is this? `"3.00"`

[Show answer/example](#)

What kind of data type is this? `"891"`

[Show answer/example](#)

What kind of data type is this? `"False"`

[Show answer/example](#)

What kind of data type is this? `False`

[Show answer/example](#)

Type()

If you want to find out what data type something is, you can just use `type()`.

```
1 age = 12
2
3 print(type(age))
```

Try it!

This will print `<class 'int'>`, showing that it is an int data type.

Let's see what prints out with other variable types.

```
1 age = 12
2 name = "Susan"
3 hat = True
4
5 print(type(age))
6 print(type(name))
7 print(type(hat))
```

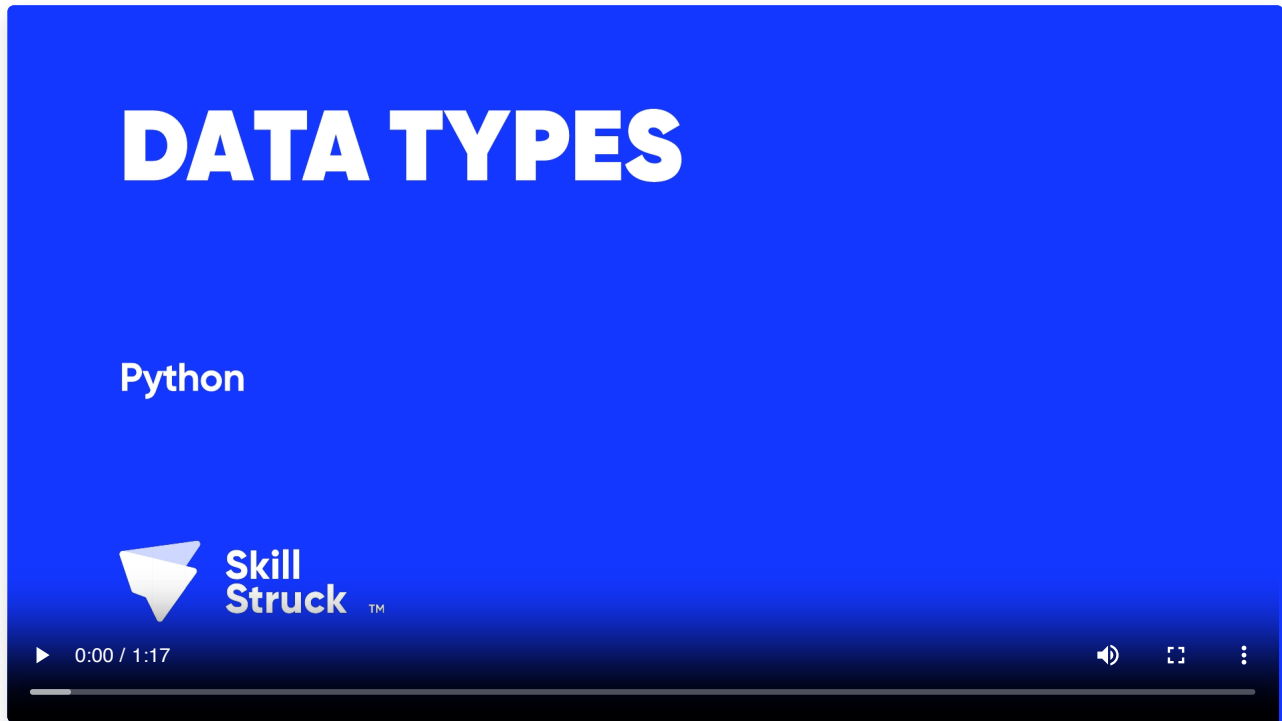
Try it!

This will print out the following.

```
<class 'int'>
```

```
<class 'str'>
```

```
<class 'bool'>
```



Checkpoint

Variable Types

Create three variables with different types:

1. A string variable
2. An integer variable
3. A boolean variable

After creating these variables, create a print statement for each of these variables. Make sure each print statement is on a separate line of code.

Requirements:

- Declare and print a "string" variable
- Declare and print an "integer" variable
- Declare and print a "boolean" variable

Questions (10)

1. Which is an example of an integer data type in Python?

MULTIPLE CHOICE

Choose the correct answer:

- A. 32
- B. true
- C. "3"
- D. "three"

2. Which examples are valid strings? Select all that apply.

SELECT MULTIPLE

Select all that apply:

- A. 'Goats are awesome.'
- B. "Goats are awesome."
- C. Goats are awesome.
- D. -Goats are awesome.-

3. Debug the following code to set a variable:

DEBUG CODE

Code to Debug:

```
1 friends : 3
```

4. Which of the following are data types in Python? Select all that apply.

SELECT MULTIPLE

Select all that apply:

- A. string
- B. integer
- C. boolean
- D. time

5. True or False: Boolean data types don't need to be capitalized

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

6. Debug the following code. Assume you are trying to create a variable and assign it to a Boolean value of True.

DEBUG CODE

Code to Debug:

```
1 finished = true
```

7. Debug the following code. Assume you are creating a variable and assign it to a string that says porcupine.

DEBUG CODE

Code to Debug:

```
1 pet = porcupine
```

8. Which of the following is an example of a string?

MULTIPLE CHOICE

Choose the correct answer:

- A. 42
- B. "Hello"
- C. True
- D. 3.14

9. What is the correct way to represent the Boolean value "True" in Python?

MULTIPLE CHOICE

Choose the correct answer:

- A. true
- B. TRUE
- C. True
- D. true()

10. Which of the following variables is correctly assigned a Boolean?

MULTIPLE CHOICE

Choose the correct answer:

- A. name = "Parker"
- B. name = 24
- C. name = True
- D. name = Parker

Challenges (5)

1. True or False?

Create a Boolean variable and assign it to `True` .

On the next line, create another Boolean variable and assign it to `False` .

Requirements:

- Create a Boolean variable assigned to `True` .
- Create a Boolean variable assigned to `False` .

2. Print 3 Types

Create one of each of these **three types of variables**, and **print** them all in separate print statements:

An Integer `42`

A String `"Hello!"`

A Boolean `True`

Requirements:

- Create a boolean variable set to `True` .
- Create a string variable set to `"Hello!"`
- Create an int variable set to `42` .
- Print all 3 variables in separate `print()` statements

3. What's Your Age?

Write a program that asks the user for their age, then prints their age in a sentence.

For example, your code should print `You are 12 years old.` if their input was `12` .

Requirements:

- Ask the user to input their age.
- Print their age in a sentence.

4. My Weekend

Talk all about your weekend! What did you do? Did you enjoy it?

Create **2 variables**: one named `did_do` and one named `wish_you_did` and assign them to **strings**.

Create **2 variables**: one named `meals` and one named `homework` and assign them to **integers**

Create **2 boolean variables** and assign one to `True` and one to `False` .

Requirements:

- Create a variable named `did_do` and set it equal to a string.
- Create a variable named `wish_you_did` and assign it to a string.
- Create a variable named `meals` and assign it to an integer.
- Create a variable named `homework` and assign it to an integer.
- Create a boolean variable and assign it to `True` .
- Create a boolean variable and assign it to `False` .

5. About Me Quiz

Create a get to know you quiz!

Create the following **5 variables**:

`is_scared_of_heights`

`loves_dogs`

`has_brown_eyes`

`knows_html`

`ate_breakfast_today`

Assign each of the **5 variables** to a **boolean** that describes you!

Print each variable.

Requirements:

- Create and print the variable `is_scared_of_heights` .
- Create and print the variable `loves_dogs`
- Create and print the variable `has_brown_eyes`
- Create and print the variable `knows_html`
- Create and print the variable `ate_breakfast_today`

Answer Keys & Solutions

Checkpoint Solutions

Variable Types

```
1 name = "Celeste"  
2 age = 13  
3 happy = True  
4  
5  
6 print(name)  
7 print(age)  
8 print(happy)
```

Questions

1. Which is an example of an integer data type in Python?

MULTIPLE CHOICE

Correct Answer:

- | | |
|------------|-------------|
| A. 32 | ✓ Correct |
| B. true | ✗ Incorrect |
| C. "3" | ✗ Incorrect |
| D. "three" | ✗ Incorrect |

Explanation:

Integers are numbers. Data types with quotation marks around them are strings.

2. Which examples are valid strings? Select all that apply.

SELECT MULTIPLE

Correct Answers:

- | | |
|-------------------------|-------------|
| A. 'Goats are awesome.' | ✓ Correct |
| B. "Goats are awesome." | ✓ Correct |
| C. Goats are awesome. | ✗ Incorrect |
| D. -Goats are awesome.- | ✗ Incorrect |

Explanation:

Strings can use either single or double quotation marks.

3. Debug the following code to set a variable:

DEBUG CODE

Incorrect Code:

```
1 friends : 3
```

Correct Solution:

```
1 friends = 3
```

Explanation:

Variables are assigned with an equals sign.

4. Which of the following are data types in Python? Select all that apply.

SELECT MULTIPLE

Correct Answers:

A. string ✓ Correct

B. integer ✓ Correct

C. boolean ✓ Correct

D. time ✗ Incorrect

Explanation:

Here are examples of data types: "Camel", 14, True

5. True or False: Boolean data types don't need to be capitalized

MULTIPLE CHOICE

Correct Answer:

A. True ✗ Incorrect

B. False ✓ Correct

Explanation:

Here is an example of a boolean: True

6. Debug the following code. Assume you are trying to create a variable and assign it to a Boolean value of True.

DEBUG CODE

Incorrect Code:

```
1 finished = true
```

Correct Solution:

```
1 finished = True
```

Explanation:

Booleans need to be capitalized

7. Debug the following code. Assume you are creating a variable and assign it to a string that says porcupine.

DEBUG CODE

Incorrect Code:

```
1 pet = porcupine
```

Correct Solution:

```
1 pet = "porcupine"
```

Explanation:

Strings can use either single or double quotation marks.

8. Which of the following is an example of a string?

MULTIPLE CHOICE

Correct Answer:

A. 42

✗ Incorrect

B. "Hello"

✓ Correct

C. True

✗ Incorrect

D. 3.14

✗ Incorrect

Explanation:

Strings are designated by quotation marks

9. What is the correct way to represent the Boolean value "True" in Python?

MULTIPLE CHOICE

Correct Answer:

- A. true ✗ Incorrect
- B. TRUE ✗ Incorrect
- C. True ✓ Correct
- D. true() ✗ Incorrect

Explanation:

Booleans are capitalized in Python

10. Which of the following variables is correctly assigned a Boolean?

MULTIPLE CHOICE

Correct Answer:

- A. name = "Parker" ✗ Incorrect
- B. name = 24 ✗ Incorrect
- C. name = True ✓ Correct
- D. name = Parker ✗ Incorrect

Explanation:

Booleans are true/false statements

Challenges**1. True or False?**

Solution:

```
1 student = True
2 teacher = False
```

2. Print 3 Types

Solution:

```
1 neighbor = True
2 greeting = "Hello!"
3 number = 42
4 print(neighbor)
5 print(greeting)
6 print(number)
```

3. What's Your Age?

Solution:

```
1 age = input("What is your age?")
2 print("You are " + age + " years old")
```

4. My Weekend

Solution:

```
1 did_do = "played soccer"
2 wish_you_did = "go to the beach"
3
4 meals = 7
5 homework = 2
6
7 had_fun = True
8 did_chores = False
```

5. About Me Quiz

Solution:

```
1 is_scared_of_heights = False
2 loves_dogs = False
3 has_brown_eyes = True
4 knows_html = True
5 ate_breakfast_today = True
6
7
8 print(is_scared_of_heights)
9 print(loves_dogs)
10 print(has_brown_eyes)
11 print(knows_html)
12 print(ate_breakfast_today)
```

