



Variables and Data Types

What is a variable?

A named place in a computer's memory to store data

Can later retrieve or change the data
using the variable's name

Declaring variables

In Python, we use an assignment statement to declare a variable in this general format:

variable = expression

$x = 3$

Declaring variables

```
"""
```

```
Improper way of declaring variables
```

```
"""
```

```
1x = 123          # Improper way of declaring variables. Cannot begin with a digit
```

```
bob#-2 = "bob"    # Variable names can only use letters, digits, or underscores
```



data_types.py ×

```
1  """
2  Declaring Variables
3  """
4  x = 12.2
5  y = 7
6  z = 9.0
7  print(x)
8  print(y)
9  print(z)
10
```



data_types.py ×

```
1  """
2  Declaring Variables
3  """
4  x = 12.2
5  y = 7
6  z = 9.0
7  print(x)
8  print(y)
9  print(z)
10
```

TERMINAL OUTPUT PROBLEMS DEBUG CONSOLE

1: bash

```
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```

```
$ python data_types.py
```

```
12.2
7
9.0
```

```
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```

```
$
```

Primitive data types

```
name = "Bob"           # Storing a String value
age = 35                # Storing an Integer value
cash = 100.25           # Storing a Float value
retired = False         # Storing a Boolean value
```

4 primitive (basic) data types in Python: Integer, Float, String, Boolean

An **Integer** is any whole number

A **String** is a sequence of characters enclosed in quotes (single or double)

A **Float** is any decimal number

A **Boolean** is a special value that can only be True or False



data_types.py ×

```
1  """
2  Primitive Data Types
3  """
4  name = "Bob" .....# Storing a String value
5  age = 35 .....# Storing an Integer value
6  cash = 100.25 .....# Storing a Float value
7  retired = False .....# Storing a Boolean value
8
9  # How to know the Data Type of a variable
10 # Invoking the function 'type(<VARIABLE NAME>)'
11 print("Data Type of the variable 'name' is", type(name))
12 print("Data Type of the variable 'age' is", type(age))
13 print("Data Type of the variable 'cash' is", type(cash))
14 print("Data Type of the variable 'retired' is", type(retired))
15
```

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1: bash

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\$ python data_types.py

Data Type of the variable 'name' is <class 'str'>

Data Type of the variable 'age' is <class 'int'>

Data Type of the variable 'cash' is <class 'float'>

Data Type of the variable 'retired' is <class 'bool'>

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\$

Composite data types

```
nucamp_locations = ["Seattle", "Tacoma", "Bellevue"]           # List
Bob_Info = {"name": "Bob", "age": 35, "cash": 100.25, "retired": False} # Dictionary
my_tuple = ("apple", "banana", "cherry")                      # Tuple
my_set = {"cats", "dogs", "birds"}                            # Set
```

Data structures composed of one or more items stored in a single variable

Items can be of different data types and are comma separated

List: Ordered sequence
of multiple values

Dictionary: Unordered
collection of key-value pairs

Tuple: Similar to a list, but immutable

Set: Unordered collection of values,
immutable, no duplicate values



data_types.py ×

```
1  """
2  Composite Data Types
3  """
4  nucamp_locations = ["Seattle", "Tacoma", "Bellevue"] .....# Storing a List
5  Bob_Info = {"name": "Bob", "age": 35, "cash": 100.25, "retired": False} .....# Storing a Dictionary
6  my_tuple = ("apple", "banana", "cherry") .....# Storing a Tuple
7  my_set = {"cats", "dogs", "birds"} .....# Storing a Set
8
9  print("Data Type of the variable 'nucamp_locations' is", type(nucamp_locations))
10 print("Data Type of the variable 'Bob' is", type(Bob_Info))
11 print("Data Type of the variable 'my_tuple' is", type(my_tuple))
12 print("Data Type of the variable 'my_set' is", type(my_set))
13
```

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1: bash

```
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$ python data_types.py
Data Type of the variable 'nucamp_locations' is <class 'list'>
Data Type of the variable 'Bob' is <class 'dict'>
Data Type of the variable 'my_tuple' is <class 'tuple'>
Data Type of the variable 'my_set' is <class 'set'>
```

```
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$
```

Comments

```
# The "#" symbol is a way to cause a line to be ignored when the program is run

"""
For multi-line comments,
surround the text with triple quotes
"""
```

As programs get bigger and more complicated, they get more difficult to read

Comments let you write notes in your code that are ignored at program execution

They can be used to temporarily disable some code for testing

Comments

```
# The "#" symbol is a way to cause a line to be ignored when the program is run

"""
For multi-line comments,
surround the text with triple quotes
"""
```

Create a single-line comment by using a `#` - all following text on that line will be ignored

Create a multi-line comment by surrounding the text you want to "comment out" with a pair of three quotes



data_types.py X

```
1  """
2  Composite Data Types
3  """
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10 # print("Data Type of the variable 'Bob' is", type(Bob_Info))
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\$

data_types.py X

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14 """
```

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1: bash

```
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$ python data_types.py
Data Type of the variable 'nucamp_locations' is <class 'list'>
```

```
minae@PSYCHE MINGW64 ~/Desktop/NucampPython/1 - Fundamentals
$
```