



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:

$$x = 3$$



Declaring variables



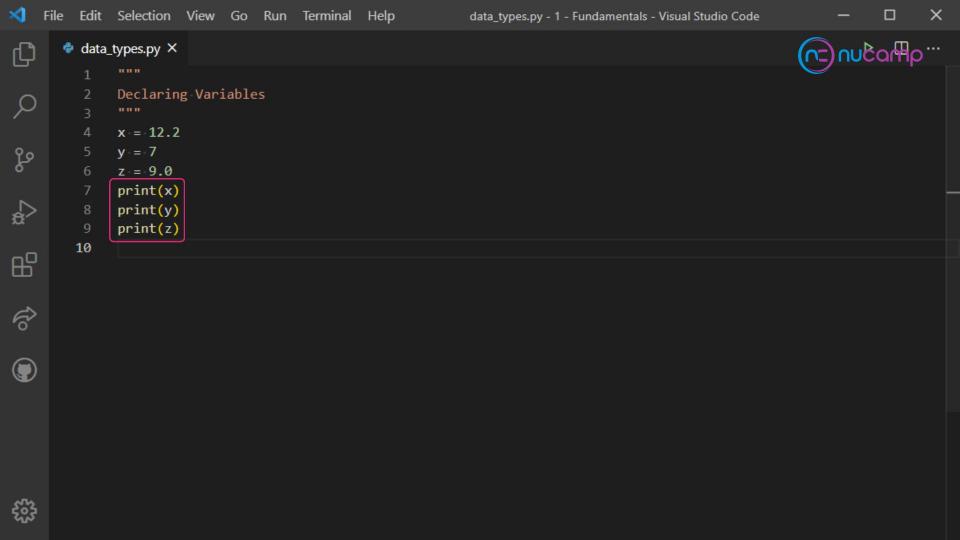
....

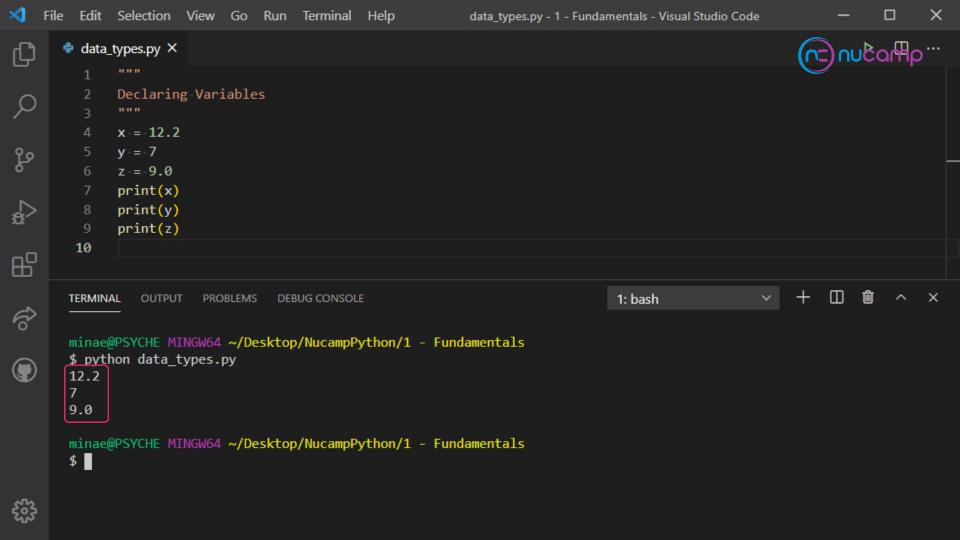
Improper way of declaring variables

....

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

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







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
```

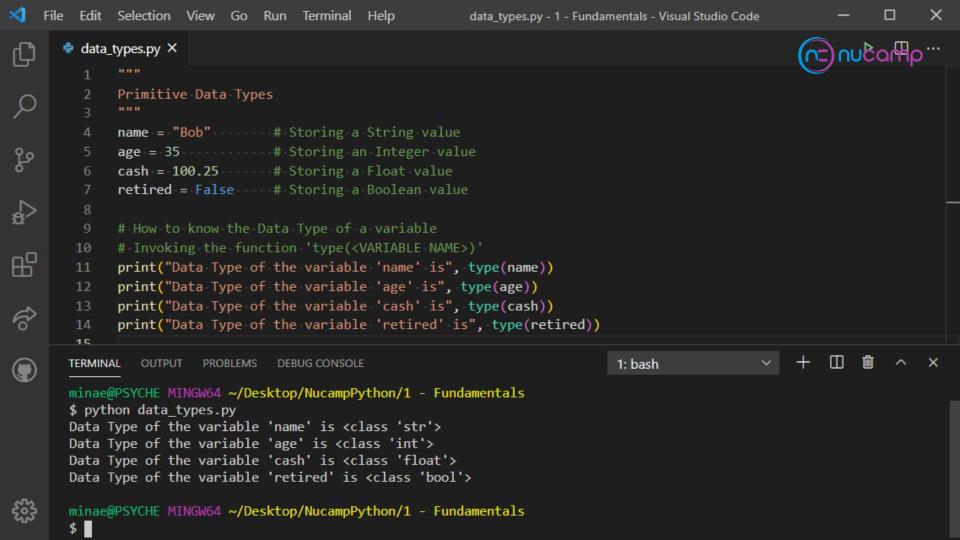
4 primitive (basic) data types in Python: Integer, Float, String, Boolean

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





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

```
Edit Selection View Go Run Terminal Help
                                                    data_types.py - 1 - Fundamentals - Visual Studio Code
      data_types.py X
            11 11 11
           Composite Data Types
            nucamp locations = ["Seattle", "Tacoma", "Bellevue"] # Storing a List
            Bob Info = {"name": "Bob", "age": 35, "cash": 100.25, "retired": False} - # Storing a Dictionary
            my set = {"cats", "dogs", "birds"}
# Storing a Set
            print("Data Type of the variable 'nucamp locations' is", type(nucamp locations))
            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
8
      TERMINAL
              OUTPUT
                      PROBLEMS
                              DEBUG CONSOLE
                                                                      1: bash
      minae@PSYCHE MINGW64 ~/Desktop/NucampPython/1 - Fundamentals
      $ 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'>
      minae@PSYCHE MINGW64 ~/Desktop/NucampPython/1 - Fundamentals
      $
```



Comments



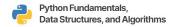
```
# The "#" symbol is a way to cause a line to be ignored when the program is run
"""

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

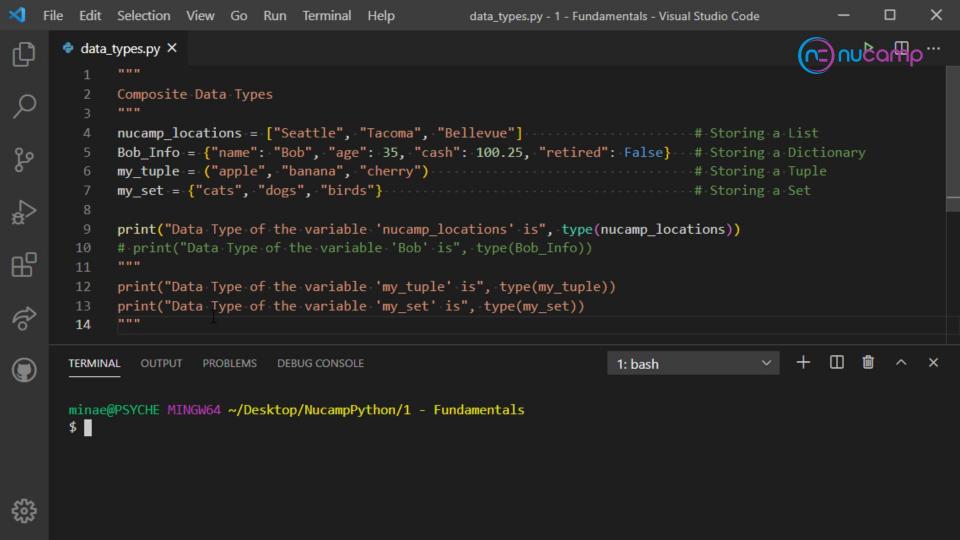


```
# The "#" symbol is a way to cause a line to be ignored when the program is run
"""

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



```
Edit Selection View Go Run Terminal Help
                                          data_types.py - 1 - Fundamentals - Visual Studio Code
data_types.py X
     11 11 11
     Composite Data Types
     Bob Info = {"name": "Bob", "age": 35, "cash": 100.25, "retired": False} - # Storing a Dictionary
     my set = {"cats", "dogs", "birds"}
# Storing a Set
     print("Data Type of the variable 'nucamp locations' is", type(nucamp locations))
     # print("Data Type of the variable 'Bob' is", type(Bob Info))
 11
     print("Data Type of the variable "my tuple' is", type(my_tuple))
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     print("Data Type of the variable 'my set' is", type(my set))
 13
 14
TERMINAL
        OUTPUT
              PROBLEMS
                      DEBUG CONSOLE
                                                          1: bash
minae@PSYCHE MINGW64 ~/Desktop/NucampPython/1 - Fundamentals
$ python data types.py
Data Type of the variable 'nucamp_locations' is <class 'list'>
minae@PSYCHE MINGW64 ~/Desktop/NucampPython/1 - Fundamentals
$
```