Variables

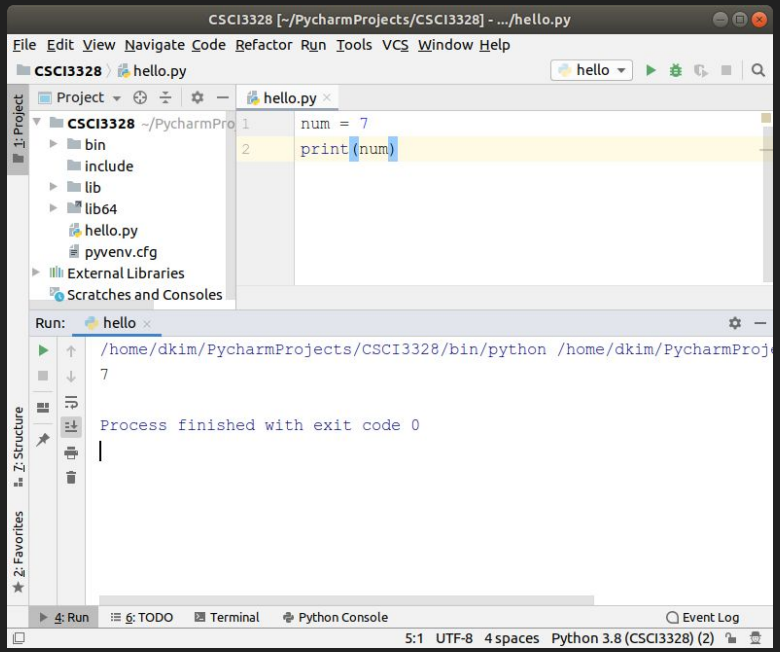
Dr. Dongchul Kim

Variables

- Variables and Memory:
  - Variables are reserved memory locations used to store values.
  - They serve as labels to identify specific memory spaces.
- Creating Variables:
  - The first assignment of a value to a variable creates that variable.
  - In Python, there's no need for explicit variable declaration.
- Assignment Example:
  - For example: `num = 3`
  - This statement declares the variable `num` and assigns the integer value `3` to it.
- Assignment Operator (=):
  - The `=` sign is an assignment operator.
  - It assigns the right-hand-side operand (e.g., `3`) to the memory space of the left-hand-side operand (e.g., `num`).

Assignment Operator

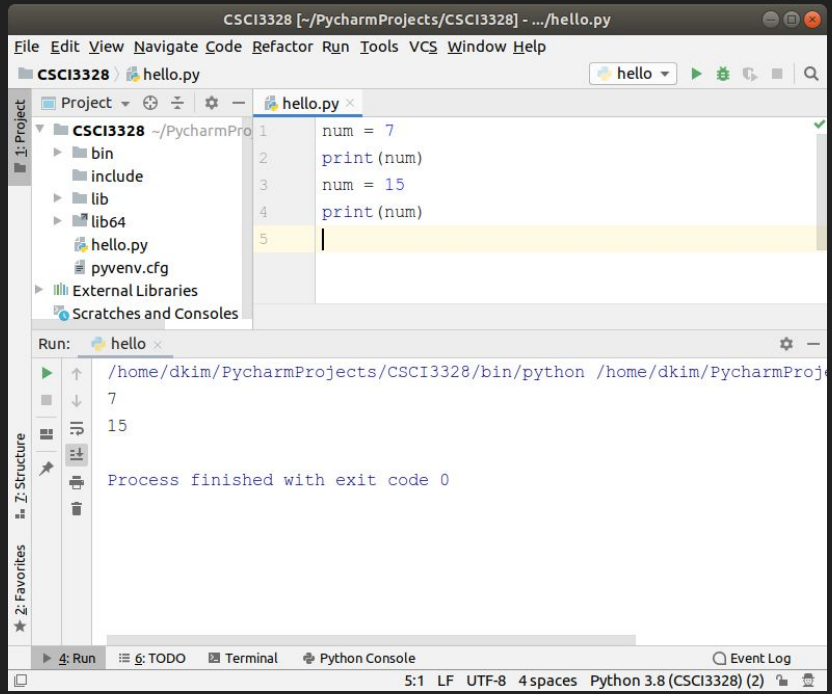
You can confirm the assigned value by printing the variable's value.
For example,



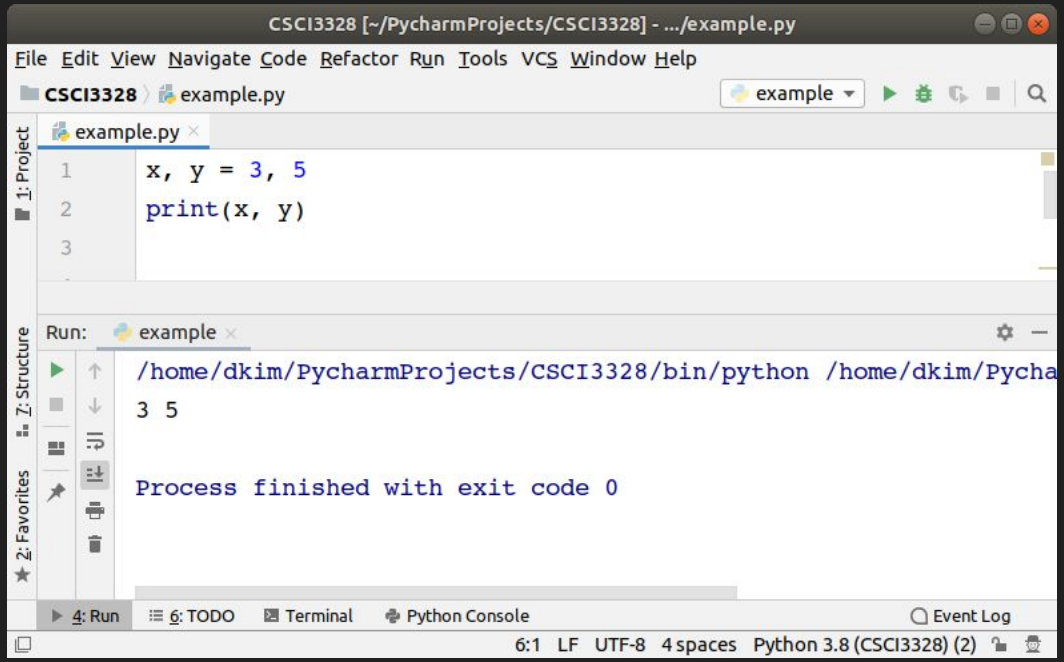
Assignment Operator

Assigned values can be updated by using the assignment operator (=) again.

For example,



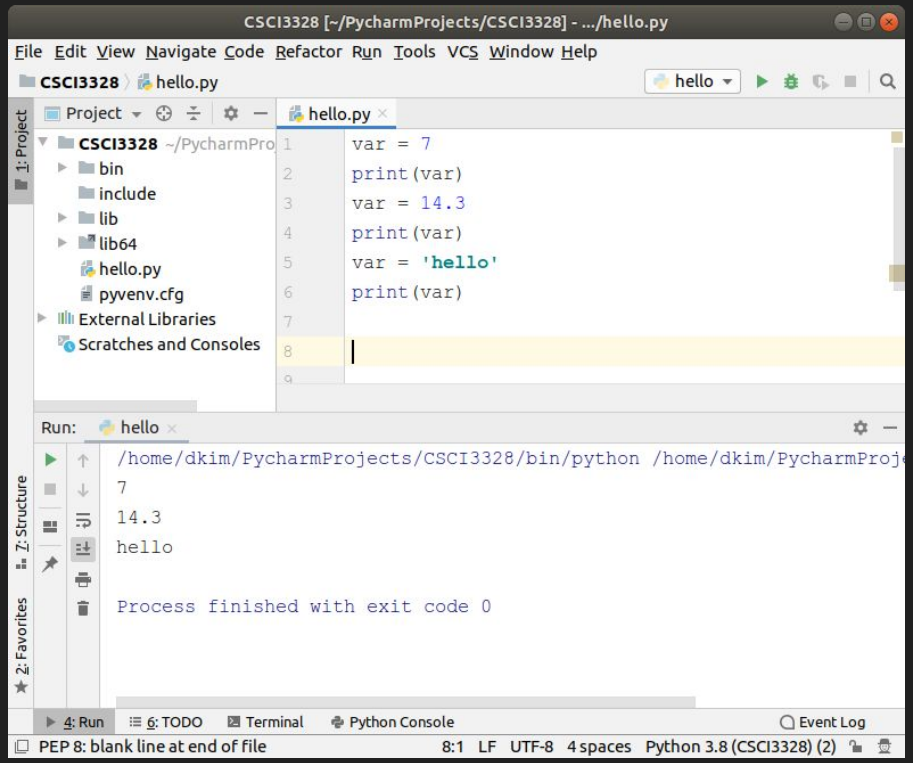
Assignment Operator



Variables

The interpreter allocates memory and determines what can be stored in variables based on their data type.

Assigning different data types allows storage of integers, decimals, or characters in these variables.



Variable types

- Python features five standard data types:
  - Numbers
  - Strings
  - Lists
  - Tuples
  - Dictionaries
- Each of these will be explained in detail later.

Naming rule

- Variable name is an identifier. It means the variable name should be unique in its scope.
- Variable name begins with letter or underscore character
- Alpha-numeric and underscores are allowed in the rest of name
- Variable names are case-sensitive

Naming rule

- These are reserved words and cannot be used as variables.

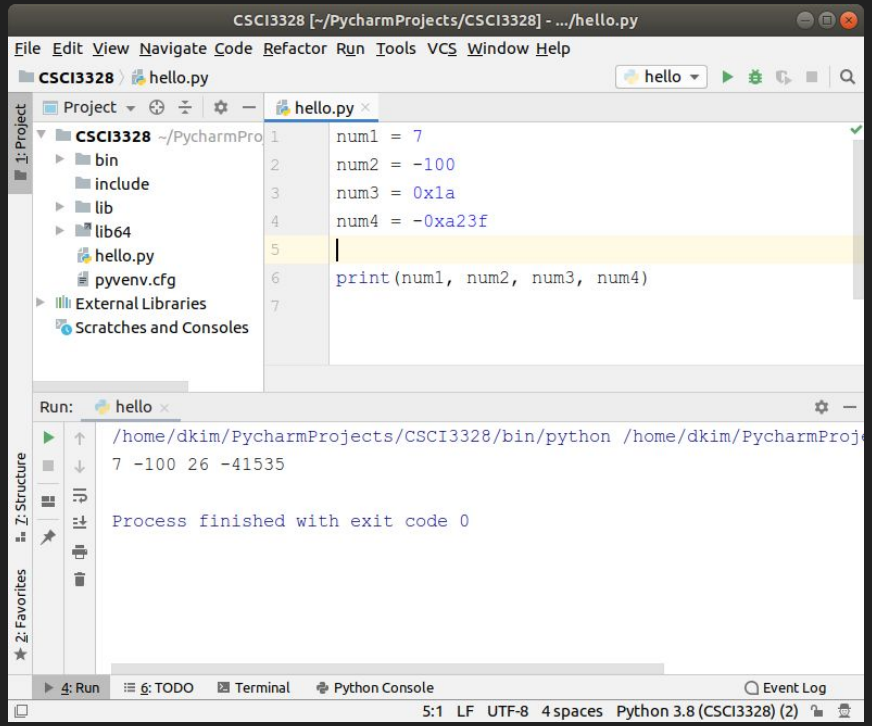
and	exec	not
assert	finally	or
break	for	pass
class	from	print
continue	global	raise
def	if	return
del	import	try
elif	in	while
else	is	with
except	lambda	yield

Variable types

- Python has five standard data types
  - Numbers
    - int (signed integers)
    - float (floating point real values)
  - String
  - List
  - Tuple
  - Dictionary

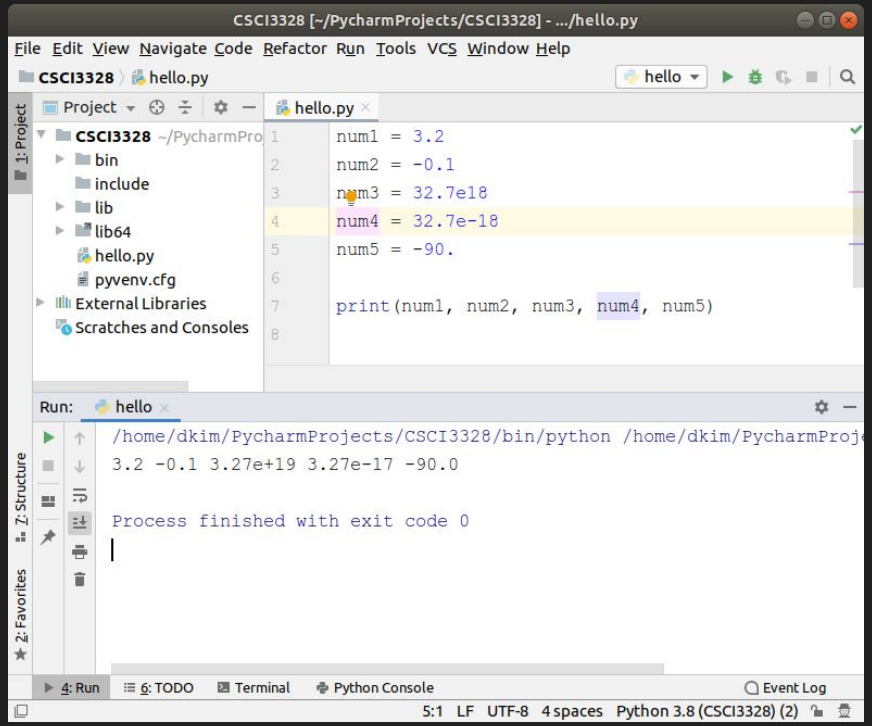
Numbers

Integer



Numbers

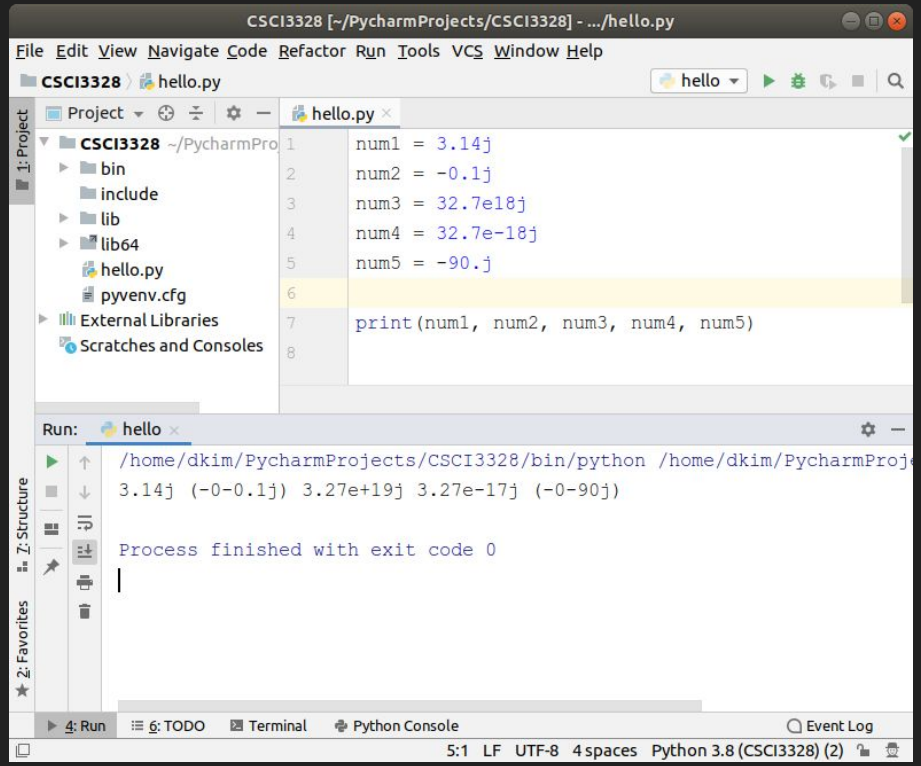
Float



Numbers

Complex

A complex number consists of an ordered pair of real floating-point numbers denoted by `x + yj`, where `x` and `y` are real numbers and `j` is the imaginary unit. [wiki]



Python F-String Format

Introduction to F-Strings:

- F-strings (formatted string literals) provide a concise and readable way to format strings in Python.

Usage:

- F-strings are created by prefixing a string with 'f' or 'F'.
- Inside an f-string, you can embed expressions inside curly braces {}.

Example:

- Syntax: `f"Hello, {name}!"`
- In this example, `name` is a variable, and its value will be inserted into the string.

Benefits:

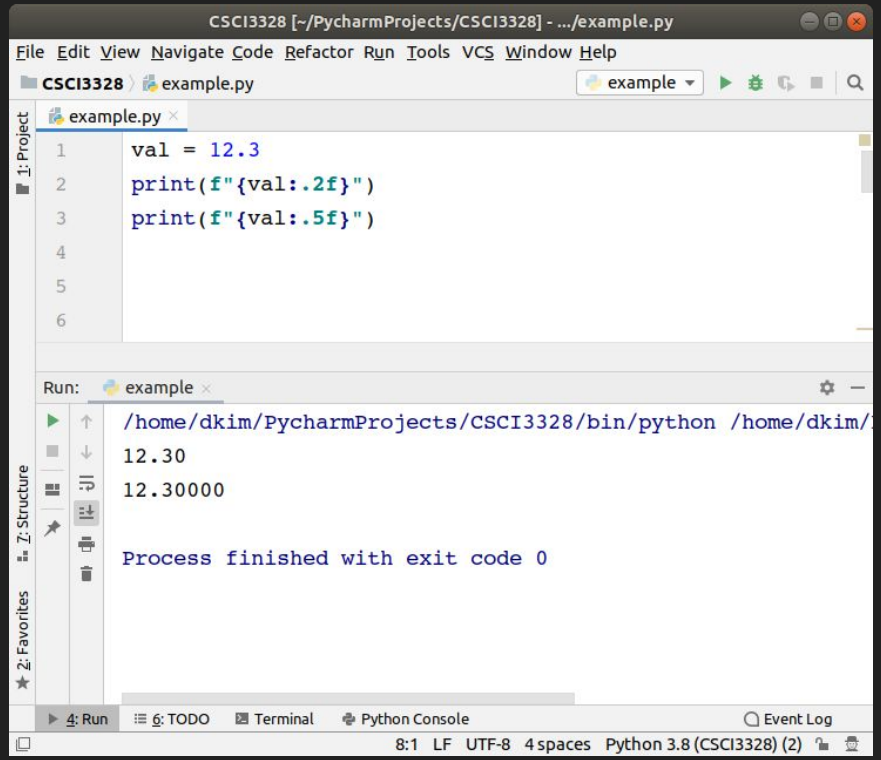
- F-strings offer a convenient way to create dynamic strings.
- They improve code readability and reduce string concatenation complexity.

Precision and Formatting:

- F-strings can specify precision for floating-point numbers and control formatting.

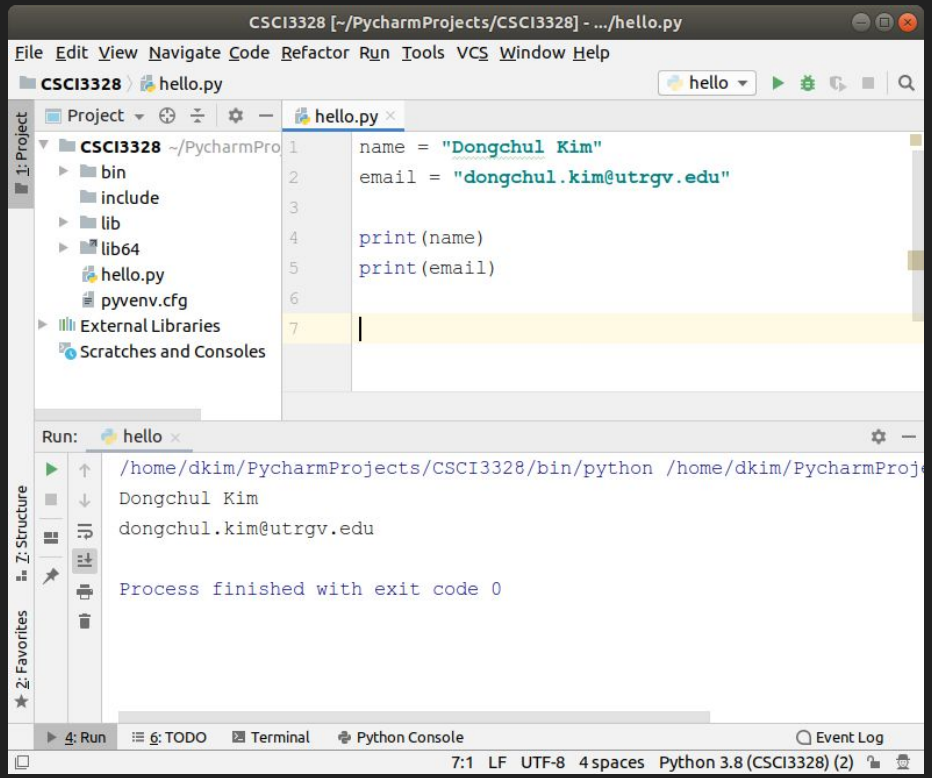
Python F-String Format: floats

Floating-point values in Python can be specified with the 'f' suffix.
Precision, or the number of decimal places, is indicated immediately after the dot character.



String

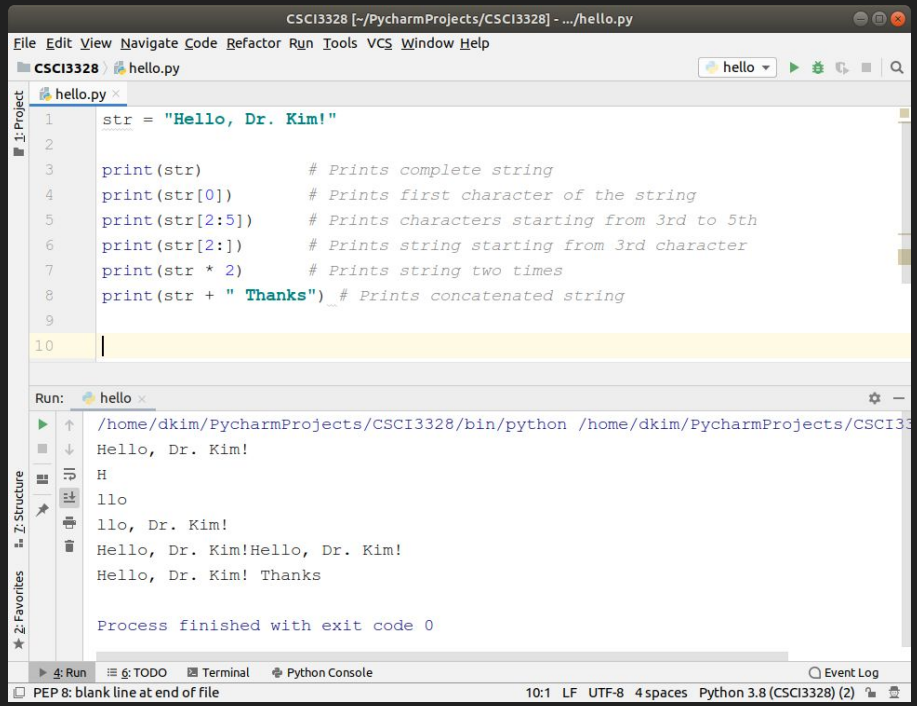
strings are defined as a sequence of characters enclosed in either single or double quotation marks.



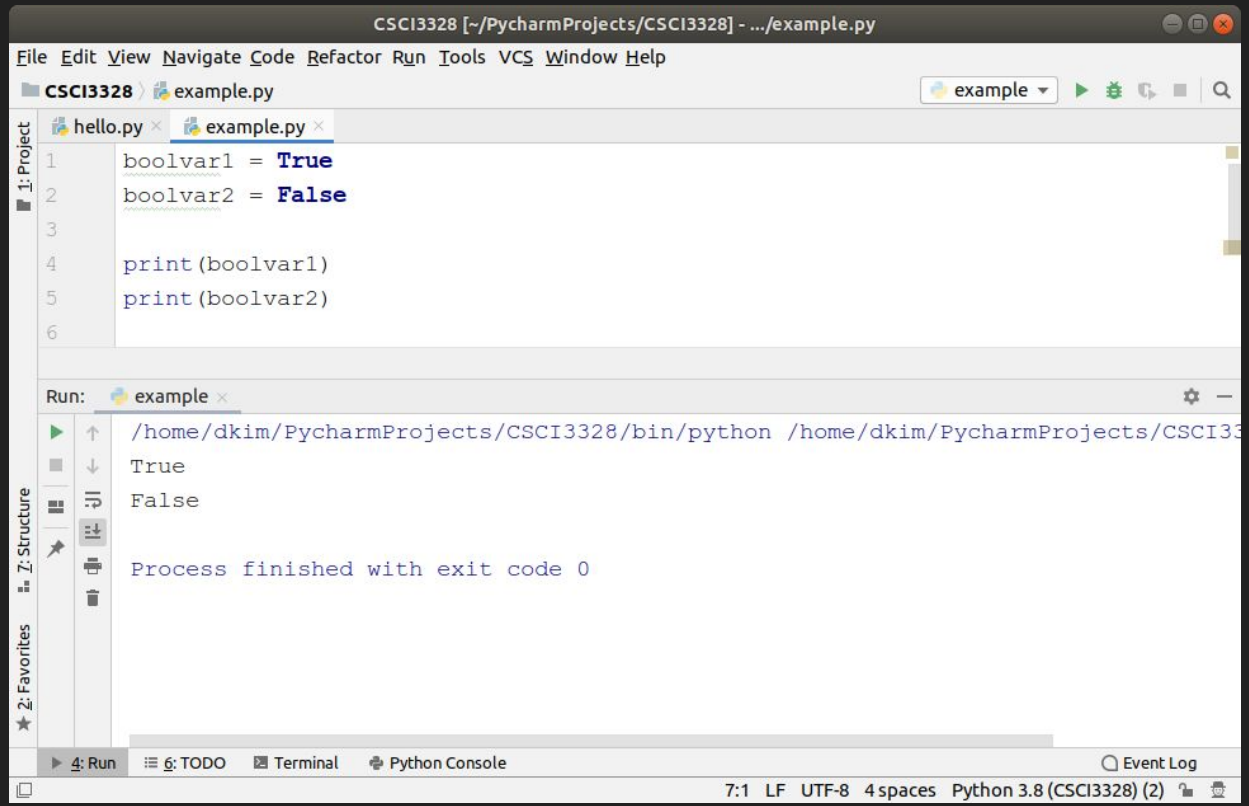
String

Subsets of strings can be taken using the slice operator (`[ ]` and `[:]`) with indexes starting at `0` in the beginning of the string and working their way from `-1` at the end.

The plus (`+`) sign is the string concatenation operator and the asterisk (`*`) is the repetition operator.



Boolean values in python



Lab 5: Define and Display Variables

1. Objective:
   - Define six variables and assign appropriate values to them.
   - Display the variables along with their values using the `print` function.
2. Variables:
   - Your Name
   - Email
   - Expected GPA (0.0~4.0)
   - Level of Programming Skill (0~10)
   - Interest in Machine Learning (T/F)
   - Desired Job/Area After Graduation
3. Assignment Example:
   - Define and assign values to the variables.
   - Use the `print` function to display the variables and their values.
4. Submission:
   - Capture your code and the output together in a single image.
   - Upload the image to Blackboard.

Lab 5

Variable Definition (40 Points):
Correctly defining six variables: Name, Email, Expected GPA, Programming Skill Level, Interest in Machine Learning, Desired Job/Area After Graduation (40 Points)
Missing or incorrectly defined variables (0 Points)

Display Variables Using Print Function (30 Points):
Successfully using the print function to display each variable and its assigned value (30 Points)
Incomplete or incorrect use of the print function (0 Points)

Screenshot and Submission (30 Points):
Submitting a clear image capturing both the code and its output (30 Points)
Incomplete, unclear, or incorrect screenshot (0 Points)

Total Points: 100

List

A list is an ordered and changeable collection in Python.

It allows duplicate members.

More details about lists will be covered later.