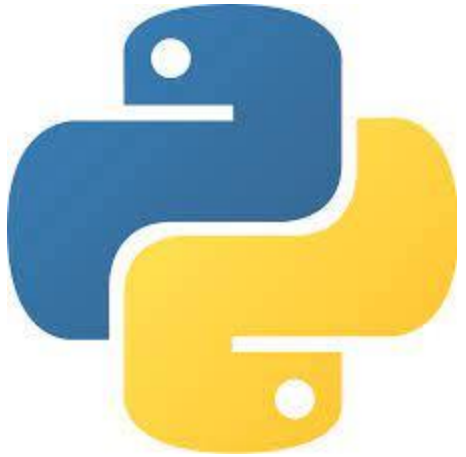

Python Programming

LECTURE-3

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KIRTI SHARMA

KRTBHARDWAJ1@GMAIL.COM

Topics Covered

- Basic Syntax
- Interactive Window (Shell)
- Editor Window
- Editing, Saving & Running a Script

First Python Program

First Python Program

Now that you have the latest version of Python installed on your computer, it's time to start coding!

- Write your first Python program
- Learn what happens when you run a program with an error
- Learn how to declare a variable and inspect its value
- Learn how to write comments

Write a Python Program

If you don't already have IDLE open, then go ahead and open it. There are two main windows that you'll work with in IDLE: the **interactive window**, which is the one that opens when you start IDLE, and the **editor window**.

You can type code into both the interactive window and the editor window. The difference between the two windows is in how they execute code. In this section, you'll learn how to execute Python code in both windows.

The Interactive Window

IDLE's interactive window contains a **Python shell**, which is a textual user interface used to interact with the Python language. You can type a bit of Python code into the interactive window and press Enter to immediately see the results. Hence the name *interactive* window.

The interactive window opens automatically when you start IDLE. You'll see the following text, with some minor differences depending on your setup, displayed at the top of the window:

```
Python 3.9.0 (tags/v3.9.0:1b293b6)
[MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

This text shows the version of Python that IDLE is running. You can also see information about your operating system and some commands you can use to get help and view information about Python.

The >>> symbol in the last line is called the **prompt**. This is where you'll type in your code.

Go ahead and type `1 + 1` at the prompt and press Enter:

```
>>> 1 + 1
2
>>>
```

Python evaluates the expression, displays the result (2), then displays another prompt. Every time you run some code in the interactive window, a new prompt appears directly below the result.

Executing Python in the interactive window can be described as a loop with three steps:

1. Python **reads** the code entered at the prompt.
2. Python **evaluates** the code.
3. Python **prints** the result and waits for more input.

This loop is commonly referred to as a **r**ead-**e**valuate-**p**rint **l**oop and is abbreviated as **REPL**. Python programmers sometimes refer to the Python shell as the Python REPL, or just “the REPL” for short.

Let’s try something a little more interesting than adding numbers. A rite of passage for every programmer is writing a program that prints the phrase “Hello, World” on the screen.

At the prompt in the interactive window, type the word `print` followed by a set of parentheses with the text `"Hello, World"` inside:

```
>>> print("Hello, World")
Hello, World
```

A **function** is code that performs some task and can be invoked by a name. The above code invokes, or **calls**, the `print()` function with the text `"Hello, World"` as input.

The parentheses tell Python to call the `print()` function. They also enclose everything that gets sent to the function as input. The quotation marks indicate that `"Hello, World"` really is text and not something else.

Note

IDLE **highlights** parts of your code in different colors as you type to make it easier for you to identify the different parts.

By default, functions are highlighted in purple and text is highlighted in green.

The interactive window executes a single line of code at a time. This is useful for trying out small code examples and exploring the Python language, but it has a major limitation: you have to enter your code one line at a time!

Alternatively, you can save Python code in a text file and execute all of the code in the file to run an entire program.

The Editor Window

You'll write your Python files using IDLE's editor window. You can open the editor window by selecting File > New File from the menu at the top of the interactive window.

The interactive window stays open when you open the editor window. It displays the output generated by code in the editor window, so you'll want to arrange the two windows so that you can see them both at the same time.

In the editor window, type in the same code you used to print `"Hello, World"` in the interactive window:

```
print("Hello, World")
```

IDLE highlights code typed into the editor window just like in the interactive window.

Important

When you write code in a Python file, you don't need to include the >>> prompt.

Before you run your program, you need to save it. Select File > Save from the menu and save the file as `hello_world.py`.

Note

On some systems, the default directory for saving files in IDLE is the Python installation directory. **Do not** save your files to this directory. Instead, save them to your desktop or to a folder in your user's home directory.

The `.py` extension indicates that a file contains Python code. In fact, saving your file with any other extension removes the code highlighting. IDLE only highlights Python code when it's stored in a `.py` file.

Running Python Programs in the Editor Window

To run your program, select Run > Run Module from the menu in the editor window.

Note

Pressing F5 also runs a program from the editor window.

Program output always appears in the interactive window.

Every time you run code from a file, you'll see something like the following output in the interactive window:

```
>>> ========== RESTART ==========
```

IDLE restarts the Python interpreter, which is the computer program that actually executes your code, every time you run a file. This makes sure that programs are executed the same way each time.

Opening Python Files in the Editor Window

To open an existing file in IDLE, select File > Open from the menu, then select the file you want to open. IDLE opens every file in a new editor window, so you can have several files open at the same time.

You can also open a file from a file manager, such as Windows Explorer or macOS Finder. Right-click the file icon and select Edit with IDLE to open the file in IDLE's editor window.

Double-clicking on a `.py` file from a file manager executes the program. However, this usually runs the file with the system Python, and the program window disappears immediately after the program terminates—often before you can even see any output.

For now, the best way to run your Python programs is to open them in IDLE's editor window and run them from there.