

Welcome!

Python for Beginners

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Digital Workshop Center



digitalworkshopcenter.com

Girl Develop It
don't be shy. develop it. 



@gdifortcollins

Introductions & Announcements

Welcome!

Girl Develop It is here to provide affordable and accessible programs to learn software through mentorship and hands-on instruction.

Some "rules"...

- We are here for you!
- Every question is important
- Help each other
- Have fun

Today We Will ...

- * Learn About the Python programming language
- * Install Python 3
- * Use the Python shell and IDLE
- * Print output
- * Get input from a user
- * Learn about :
 - * Data types like Strings & Integers
 - * Creating and using variables
 - * If/then/else decision making (conditionals)
 - * Loops
 - * Create Simple Games Using Python
- * HAVE FUN!

What is Python?



Guido Van Rossum



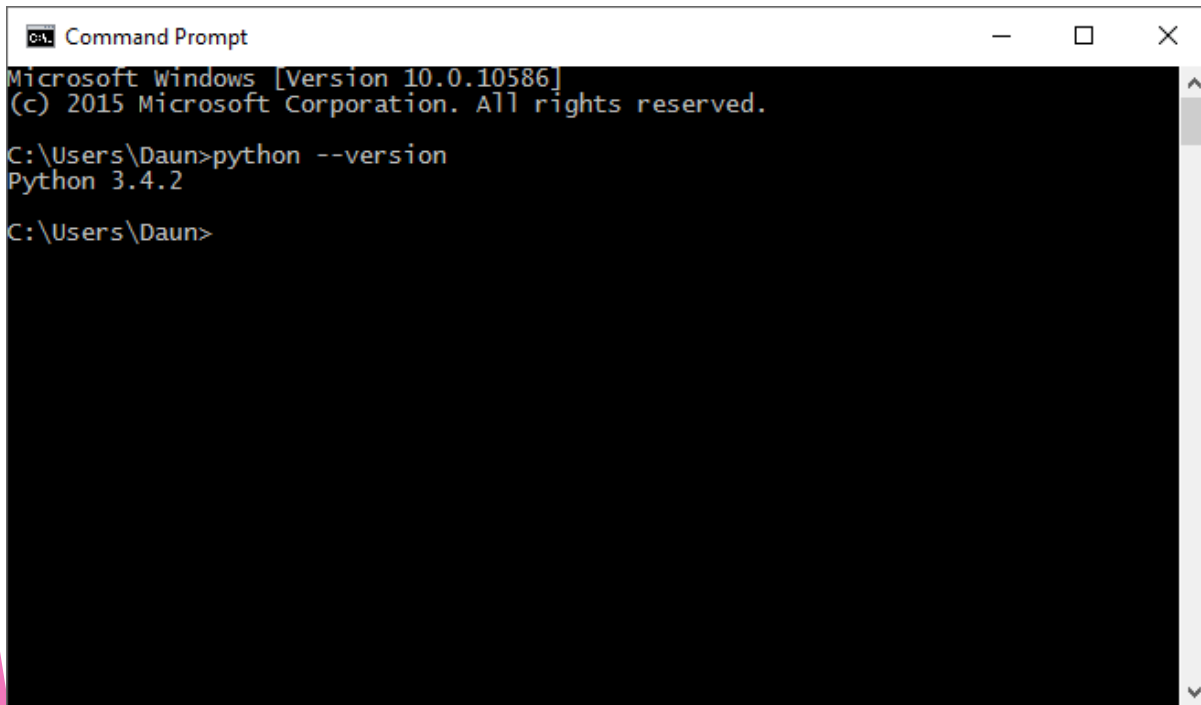
Why Python?

- Easy to Use
- Powerful
- Object-Oriented (OOP)
- “Glue” Language
- Runs Everywhere
- Free
- Open-Source
- Strong Community

The background of the slide features abstract, overlapping geometric shapes in various shades of pink and magenta, primarily concentrated on the right side and bottom, creating a modern, dynamic feel.

Let's Get Started Programming!

Do You Have Python Installed?

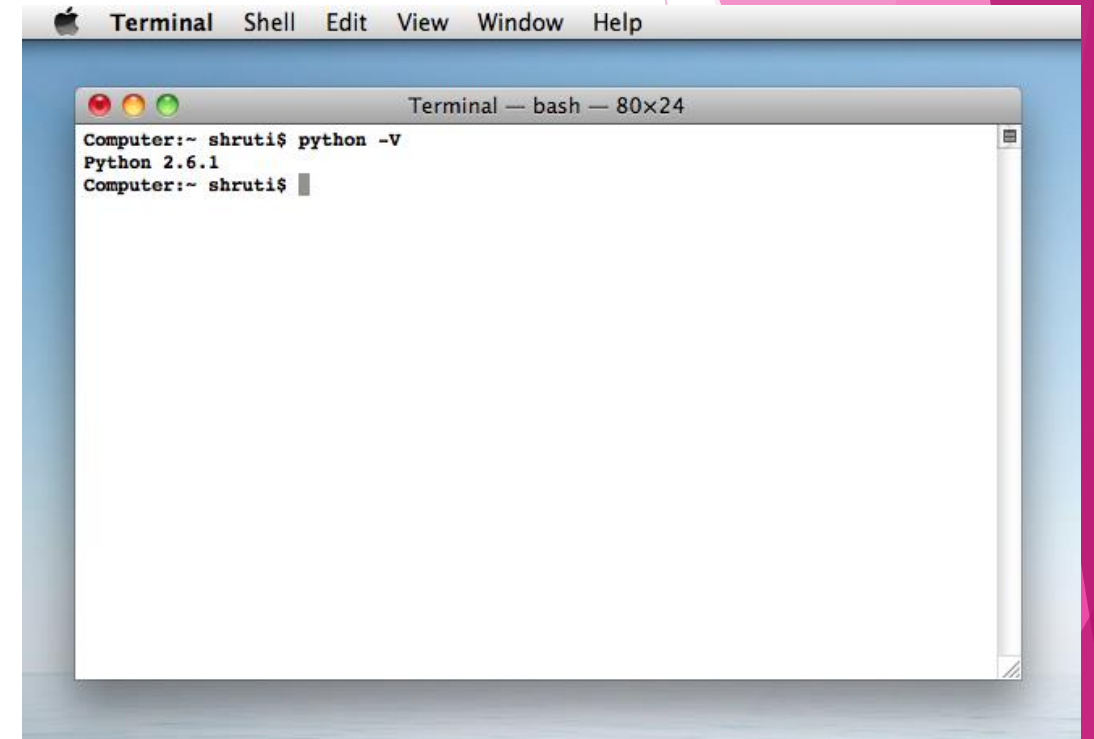


```
Command Prompt
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\Daun>python --version
Python 3.4.2

C:\Users\Daun>
```

Launch The Command Prompt From The Run Window. One of the quickest ways to launch the Command Prompt is to use the Run window (press Win+R on your keyboard to open it). Then, type cmd or cmd.exe and press Enter or click/tap OK. You can also launch it from the start menu or use Cortana on Windows 10.

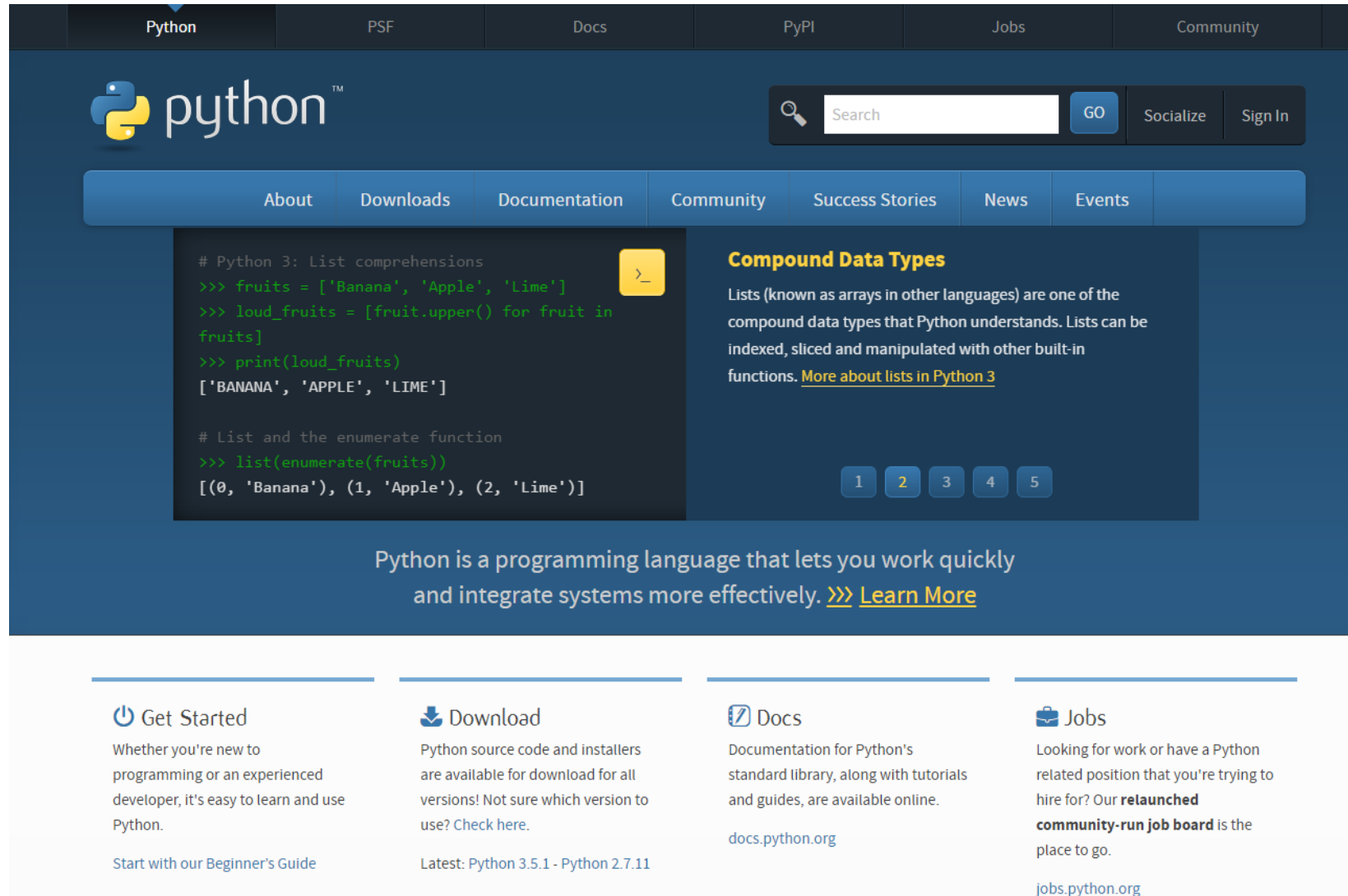


```
Terminal
Terminal — bash — 80x24

Computer:~ shruti$ python -v
Python 2.6.1
Computer:~ shruti$
```

The Terminal is a program included with all versions of Mac OS X. It is located in the Utilities folder within the Applications folder.

Python.org



The image is a screenshot of the Python.org homepage. At the top, there is a dark blue navigation bar with links for Python, PSF, Docs, PyPI, Jobs, and Community. Below this is a large blue banner featuring the Python logo, a search bar, and links for Socialize and Sign In. A secondary navigation bar contains links for About, Downloads, Documentation, Community, Success Stories, News, and Events. The main content area is split into two columns. The left column displays Python code snippets for list comprehensions and the enumerate function. The right column has a section titled 'Compound Data Types' explaining lists and providing a link to 'More about lists in Python 3'. Below the code and text is a pagination bar with numbers 1 through 5, where '2' is highlighted. At the bottom of the banner, a message states: 'Python is a programming language that lets you work quickly and integrate systems more effectively. >>> [Learn More](#)'. The footer consists of four white boxes with blue borders, each containing an icon and text: 'Get Started' (lightning bolt icon), 'Download' (download icon), 'Docs' (book icon), and 'Jobs' (briefcase icon).

Python

PSF

Docs

PyPI

Jobs

Community

python™

Search

GO

Socialize

Sign In

About

Downloads

Documentation

Community

Success Stories

News

Events

```
# Python 3: List comprehensions
>>> fruits = ['Banana', 'Apple', 'Lime']
>>> loud_fruits = [fruit.upper() for fruit in fruits]
>>> print(loud_fruits)
['BANANA', 'APPLE', 'LIME']

# List and the enumerate function
>>> list(enumerate(fruits))
[(0, 'Banana'), (1, 'Apple'), (2, 'Lime')]
```

Compound Data Types

Lists (known as arrays in other languages) are one of the compound data types that Python understands. Lists can be indexed, sliced and manipulated with other built-in functions. [More about lists in Python 3](#)

1 2 3 4 5

Python is a programming language that lets you work quickly and integrate systems more effectively. >>> [Learn More](#)

Get Started

Whether you're new to programming or an experienced developer, it's easy to learn and use Python.

Start with our [Beginner's Guide](#)

Download

Python source code and installers are available for download for all versions! Not sure which version to use? [Check here](#).

Latest: Python 3.5.1 - Python 2.7.11

Docs

Documentation for Python's standard library, along with tutorials and guides, are available online.

docs.python.org

Jobs

Looking for work or have a Python related position that you're trying to hire for? Our **relaunched community-run job board** is the place to go.

jobs.python.org

```
Python 3.4.2 Shell
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 b
it (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> |
```

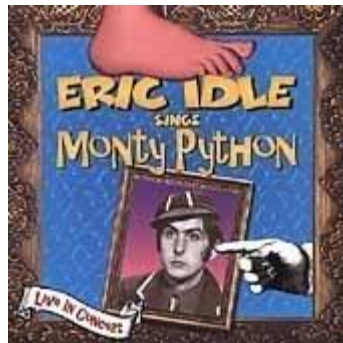
Ln: 3 Col: 4

```
Python Shell
Python 3.1 (r31:73578, Jun 27 2009, 21:49:46)
[GCC 4.0.1 (Apple Inc. build 5493)] on darwin
Type "copyright", "credits" or "license()" for more information.
>>> |
```

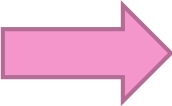
Ln: 4 Col: 4

Start IDLE (Python GUI)

Integrated
DeveLopment
Environment



Your First Python Program

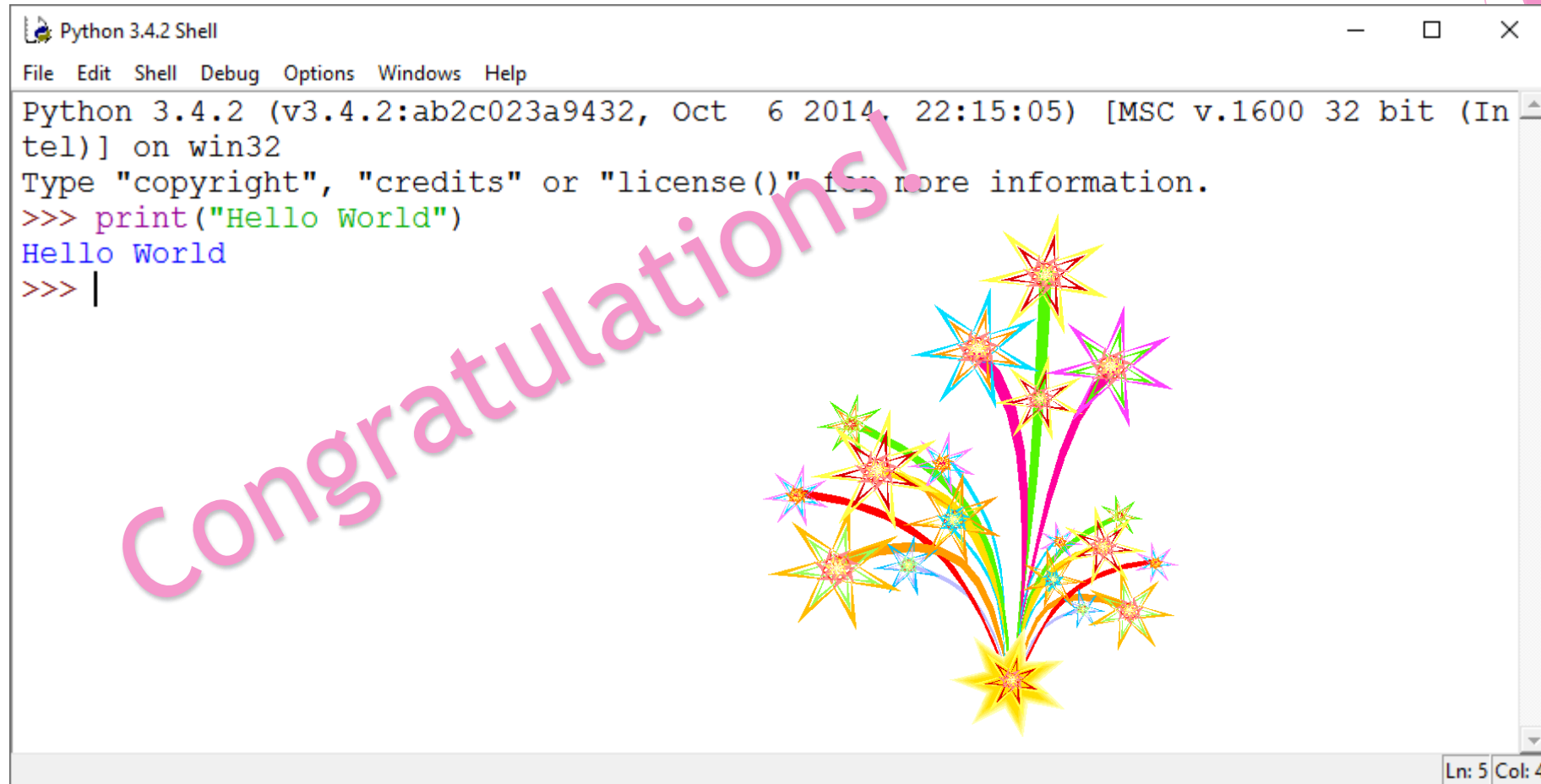


```
*Python 3.4.2 Shell*
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")|
```

Ln: 3 Col: 24

Using the Python Shell, type the statement.
Then hit the Enter Key to run the program.

Your First Python Program



A screenshot of a Python 3.4.2 Shell window. The window title is "Python 3.4.2 Shell". The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Windows", and "Help". The text area shows the following content:

```
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")
Hello World
>>> |
```

A large, stylized graphic of fireworks or stars in various colors (yellow, orange, red, green, blue, purple) is overlaid on the right side of the shell window. A large, semi-transparent pink watermark reading "Congratulations!" is diagonally across the center of the image.

Ln: 5 Col: 4

You can see the output of the program on the line below where it was typed.

Let's Have a Talk About Jargon



Jargon

Program / Code :

Sequence of instructions for a computer to perform

Function :

Mini-program with one specific task

Jargon

“Call a Function” :

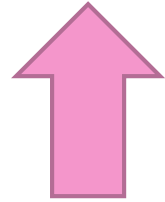
Tell a function to execute

“Pass An Argument” :

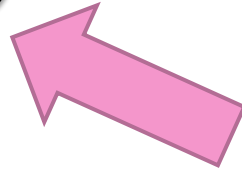
Give information to a function to use when it's executing

Example of a Function

print()



Function Name

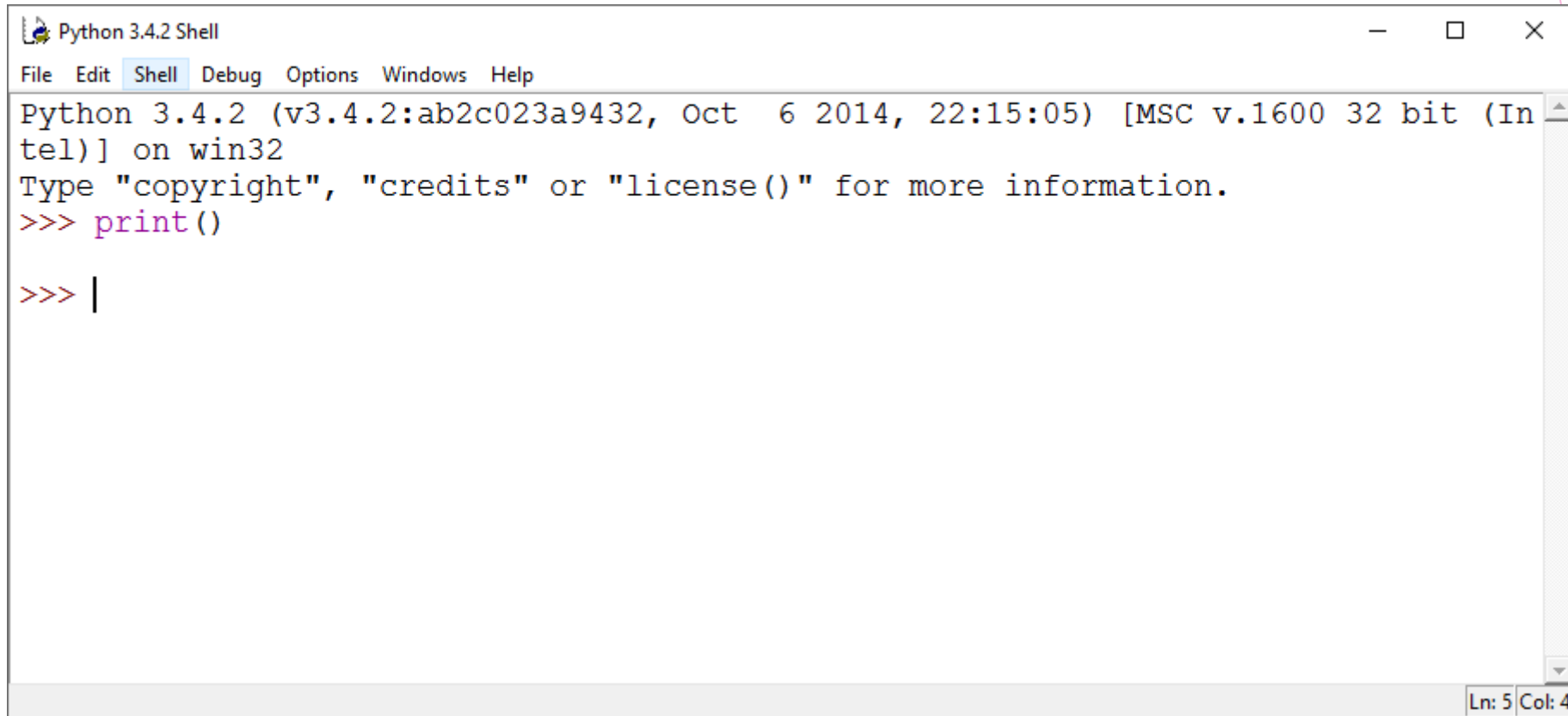


Followed by parentheses!!



Try This...

We don't pass the `print()` function an argument. What happens?



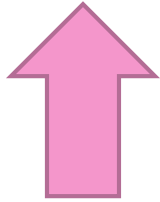
```
Python 3.4.2 Shell
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print()

>>> |
```

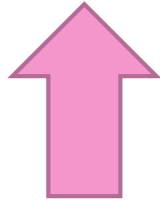
The screenshot shows a Python 3.4.2 Shell window. The title bar reads "Python 3.4.2 Shell". The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Windows", and "Help". The main text area displays the Python version and build information: "Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32". It then prompts the user: "Type 'copyright', 'credits' or 'license()' for more information." The user has entered the command `>>> print()`. The prompt `>>> |` is shown on the next line, indicating the command has been executed. The status bar at the bottom right shows "Ln: 5 Col: 4".

Passing Arguments to A Function

```
print("Hello World!")
```



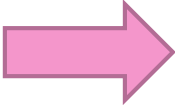
Function Name



String Argument

String : Series of Characters aka Text / Words surrounded by double quotes.

Idle helps you with colors



```
*Python 3.4.2 Shell*
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")|
```

Ln: 3 Col: 24

Jargon

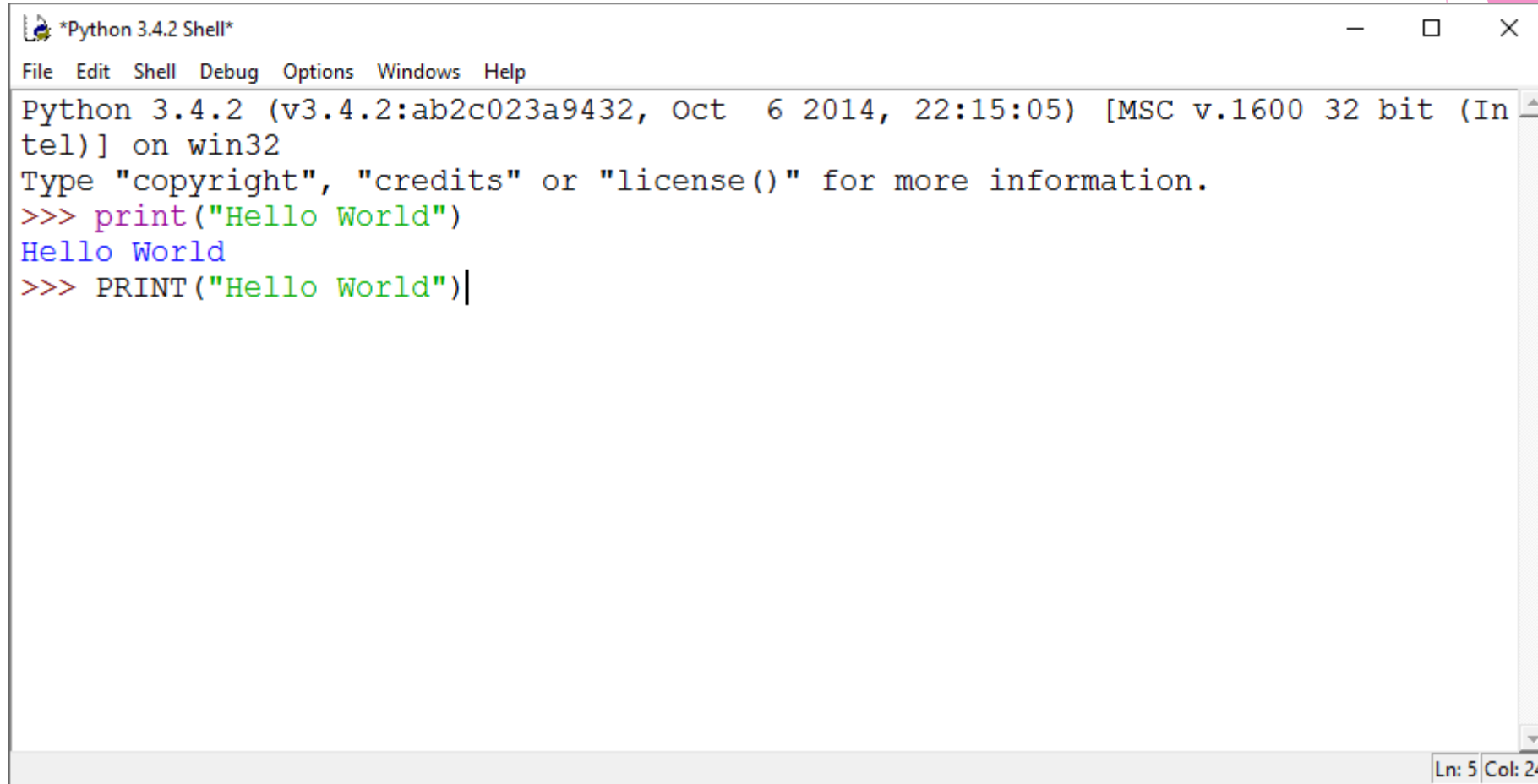
Statement :

One complete instruction for the computer

Coding :

Writing code aka programming

Try This...



A screenshot of a Python 3.4.2 Shell window. The window title is "*Python 3.4.2 Shell*". The menu bar includes File, Edit, Shell, Debug, Options, Windows, and Help. The text area shows the following output and input:

```
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")
Hello World
>>> PRINT("Hello World")|
```

The status bar at the bottom right indicates "Ln: 5 Col: 24".

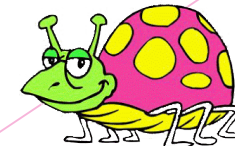
Type PRINT
Exactly
Like This

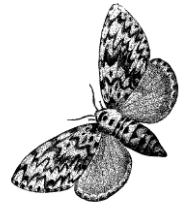


Oops! What Happened?

```
Python 3.4.2 Shell
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")
Hello World
>>> PRINT("Hello World")
Traceback (most recent call last):
  File "<pyshell#1>", line 1, in <module>
    PRINT("Hello World")
NameError: name 'PRINT' is not defined
>>> |
```

Say Hello to your First Bug!





Jargon

Bug :

An error in your computer program ... when your program doesn't work as expected.

Debug :

Find and fix the error in your program to make it work as expected.



Oops! What Happened?

Python is
CASE-SENSITIVE.

```
Python 3.4.2 Shell
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")
Hello World
>>> PRINT("Hello World")
Traceback (most recent call last):
  File "<pyshell#1>", line 1, in <module>
    PRINT("Hello World")
NameError: name 'PRINT' is not defined
>>> |
```

When you get an Error

- Notice the COLORS!
- Notice what the error information tells you.

Jargon

Syntax Highlighting :

Color Coding used to help a programmer quickly identify parts of the code.

Purple : Parts of the Python Language

Green : Strings

Blue : Output from the program

Jargon

Coder / Programmer :

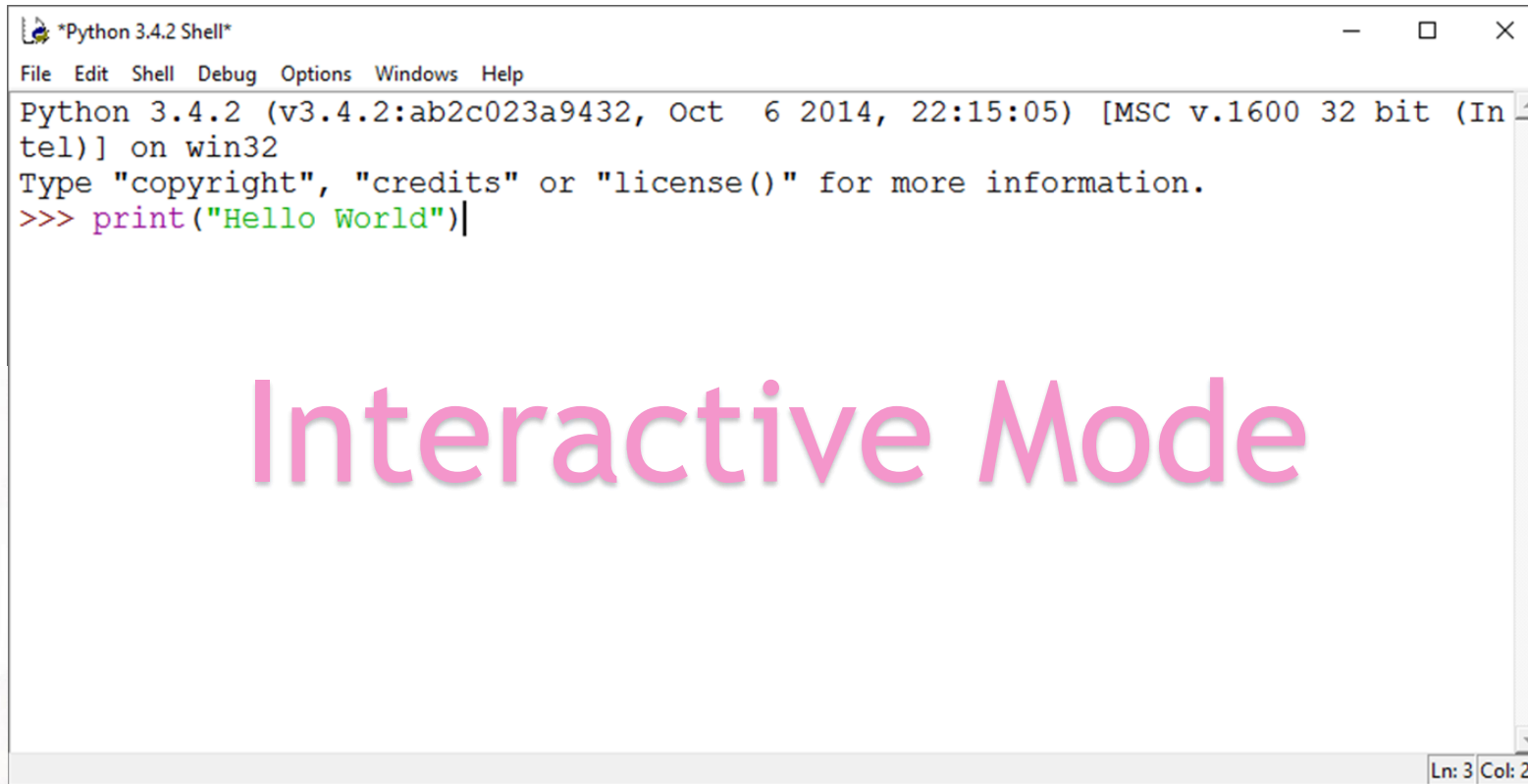
Someone who writes and debugs code
....YOU!



Python Shell / Interpreter

REPL - Read Eval Print Loop

three
greater-than
signs



```
*Python 3.4.2 Shell*
File Edit Shell Debug Options Windows Help
Python 3.4.2 (v3.4.2:ab2c023a9432, Oct 6 2014, 22:15:05) [MSC v.1600 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World")|
```

Ln: 3 Col: 24

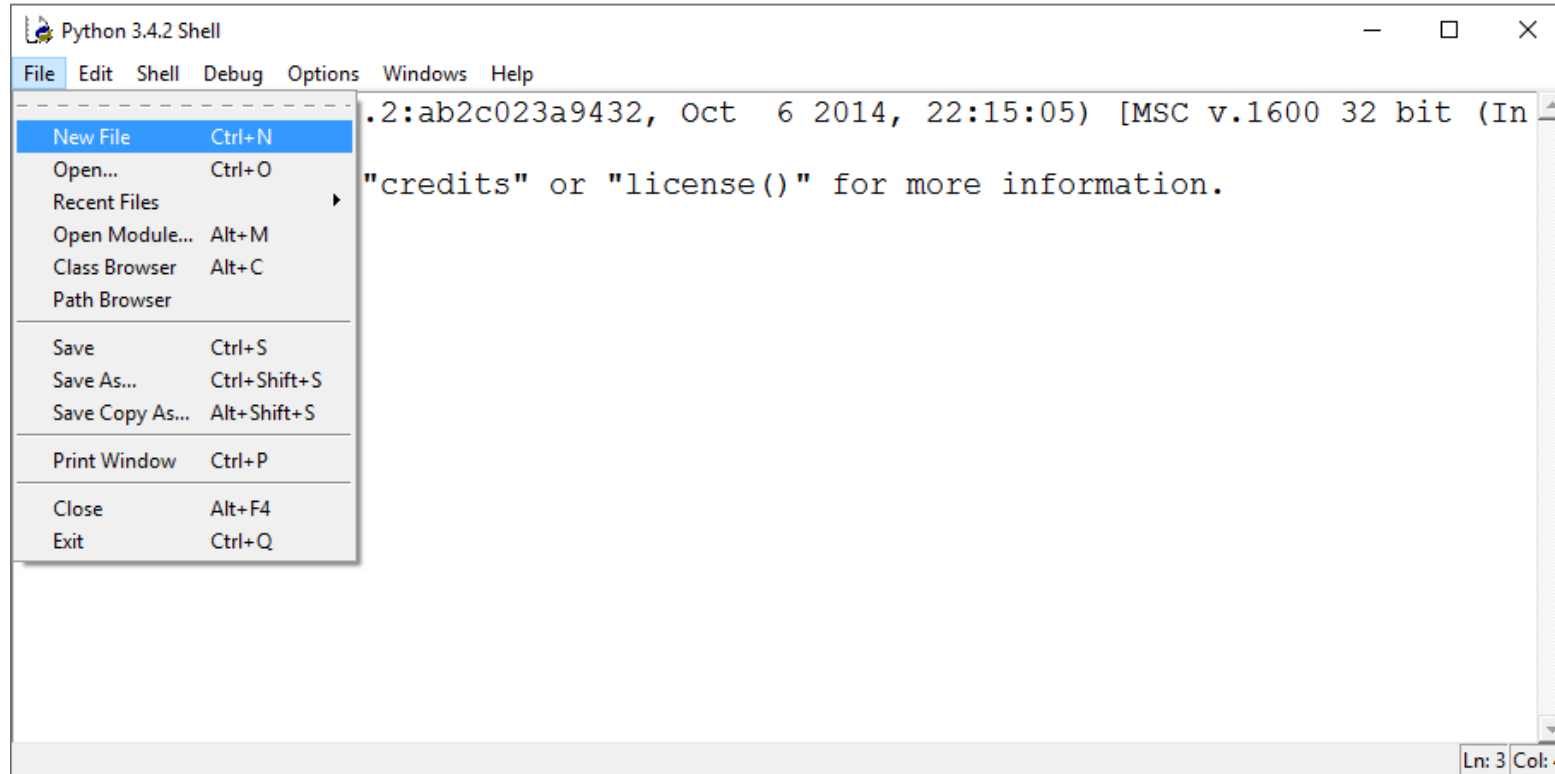
Interactive Mode

Immediate Feedback.
Quick Easy way to test out code.



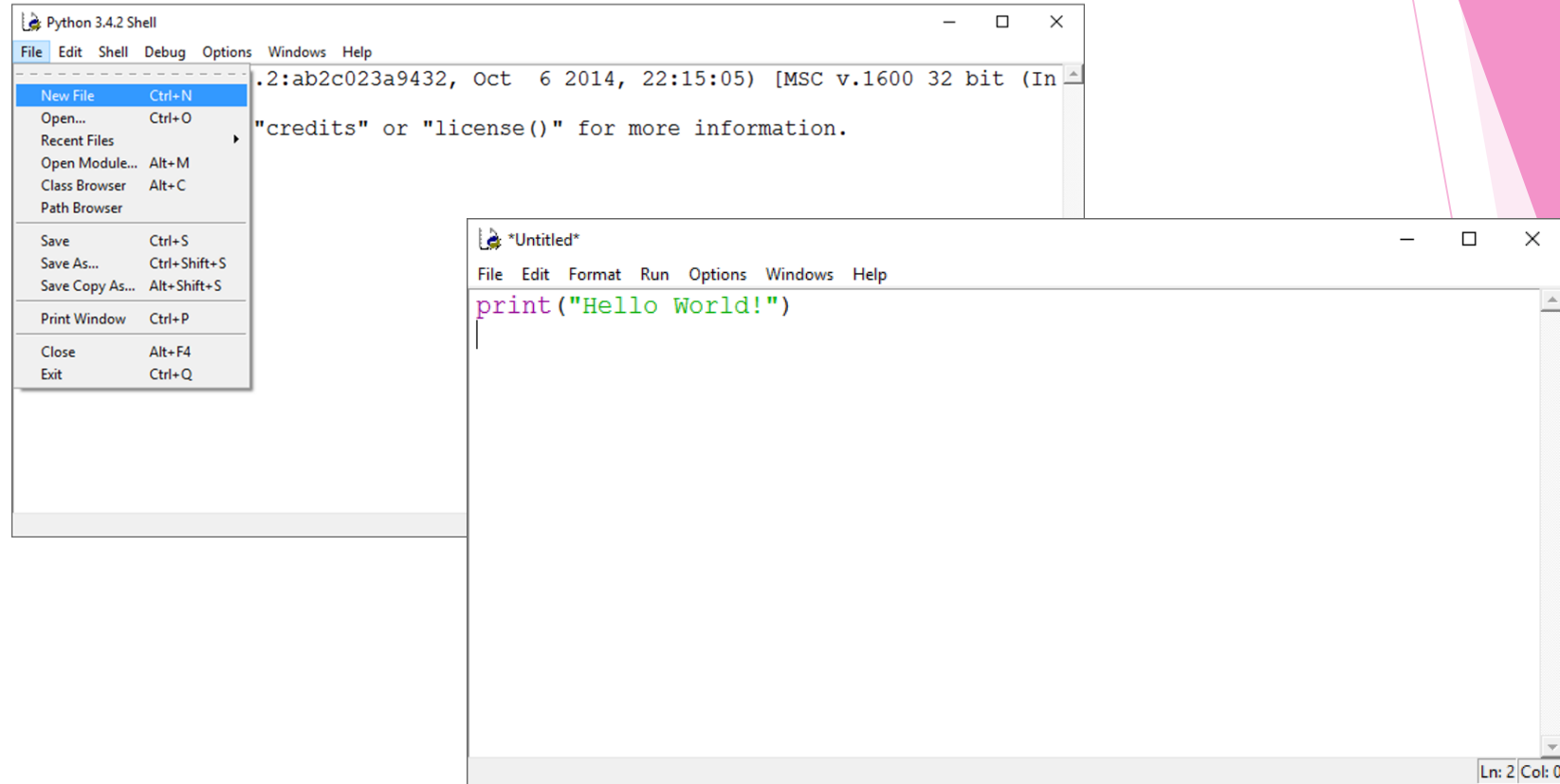
Script Mode

Like a Word Processor for Writing Programs



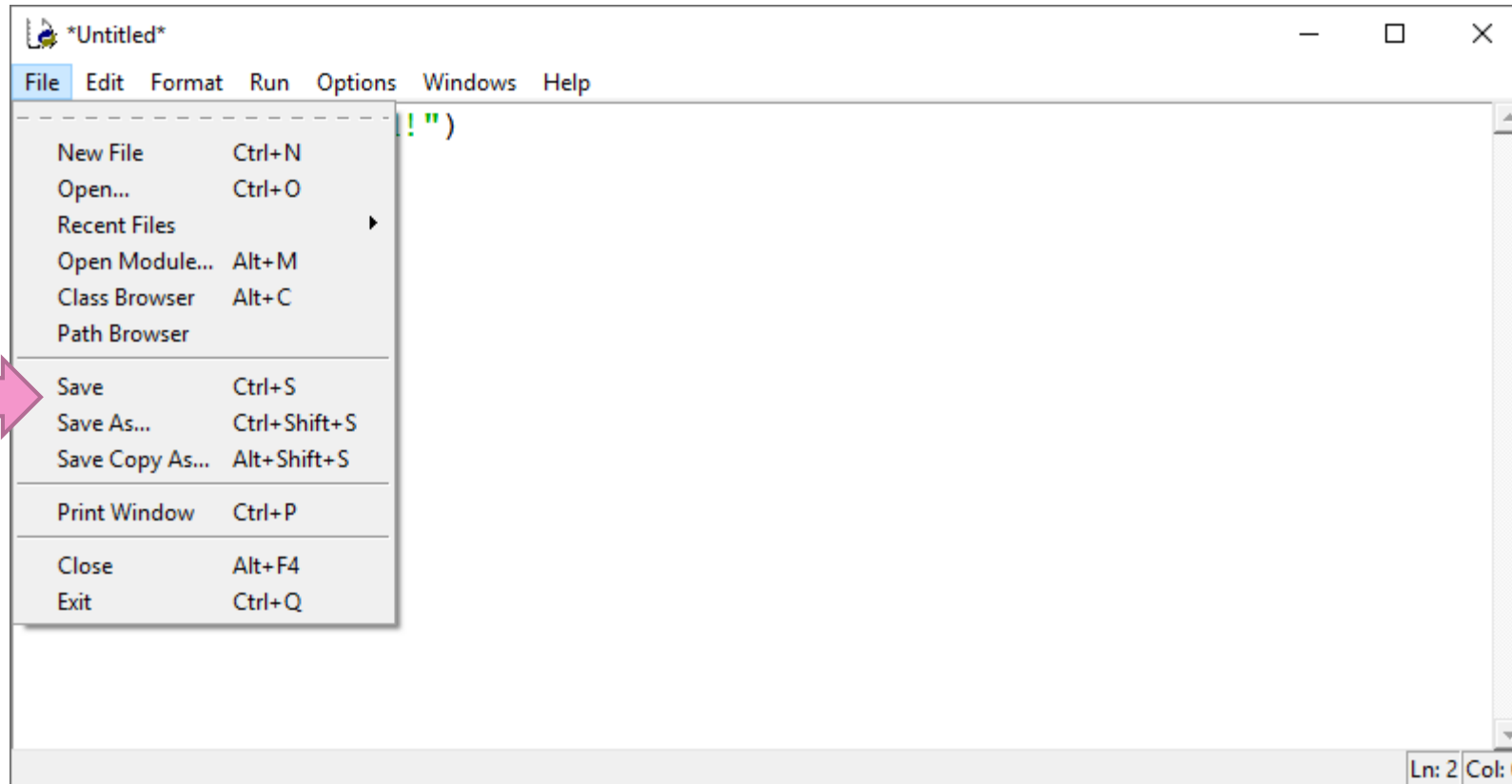
Your First Python Program(Again)

Open a new file.
Type your program.

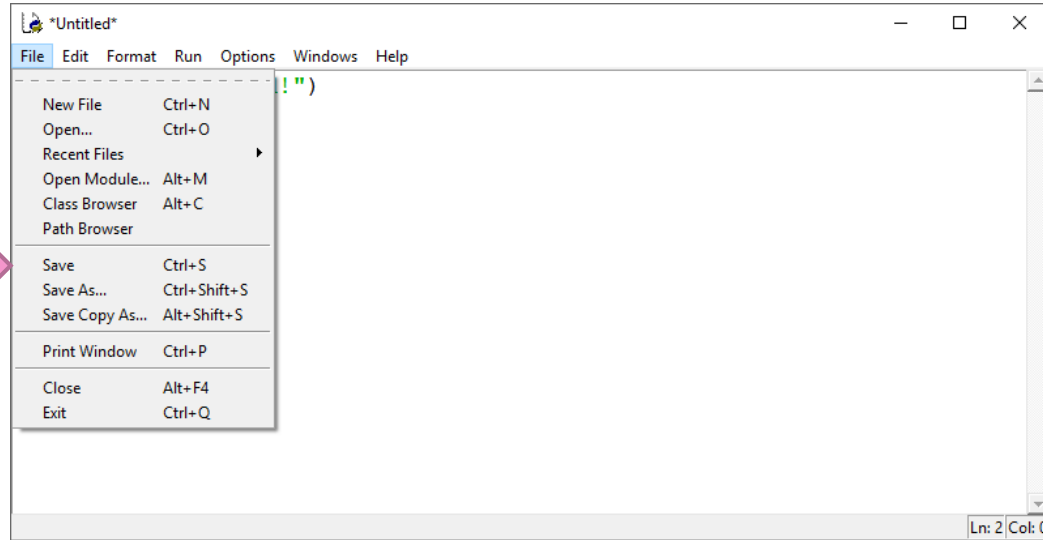


Then We need to save the program before we can run it.

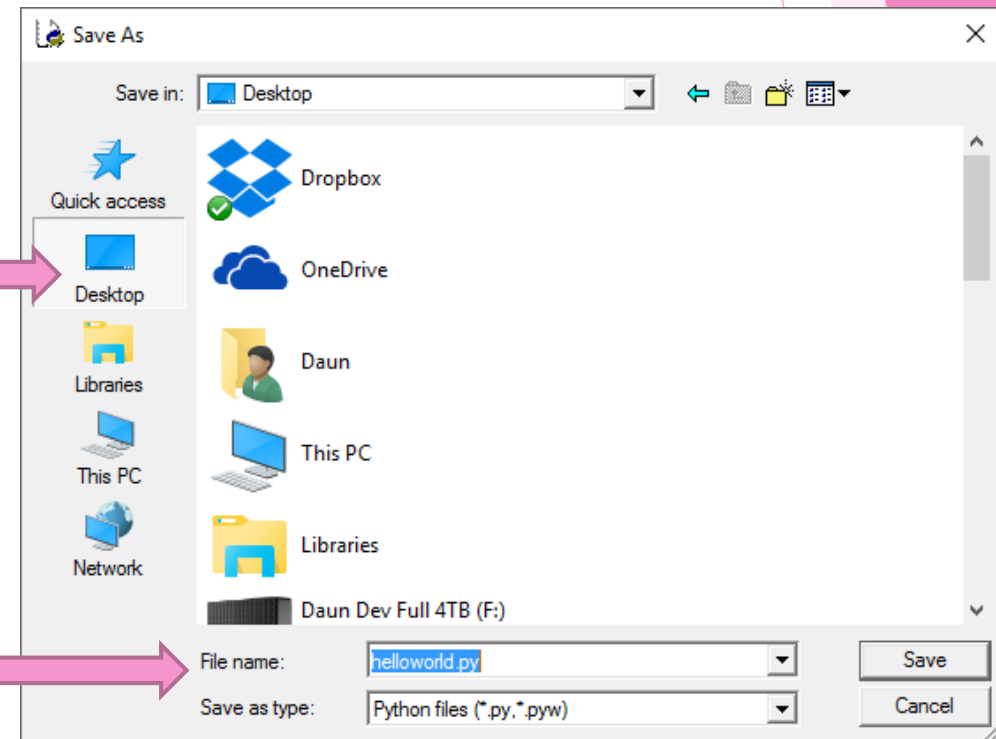
To Save Your Program



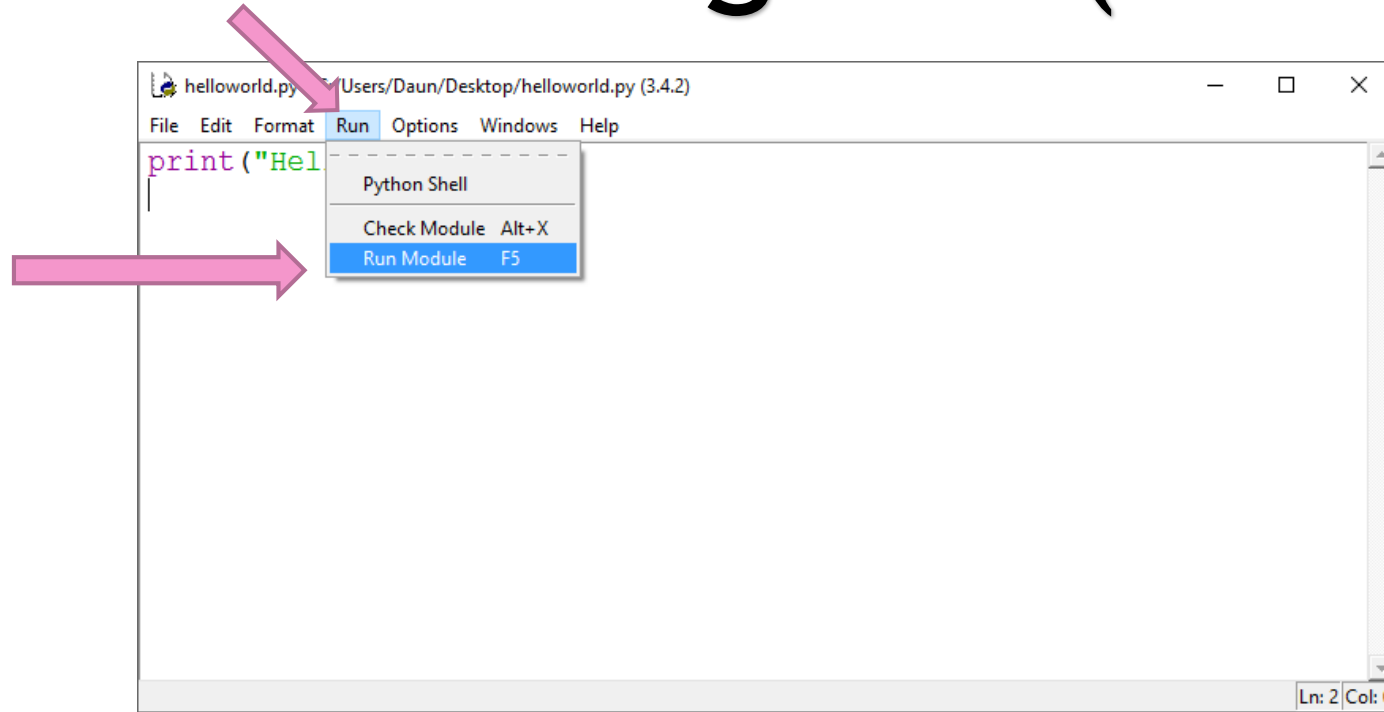
To Save Your Program



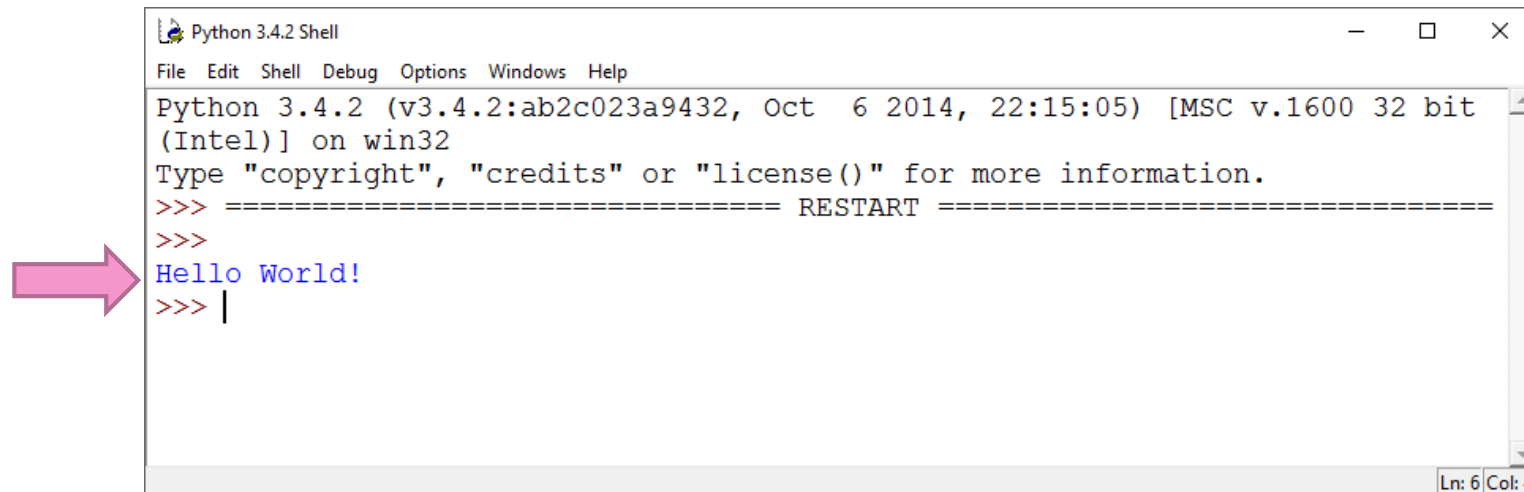
Use .py extension to name it!



To Run Your Program (First Method)



Output
shows in
the
Python
Shell



To Run Your Program (Second Method)

Find where you saved the file.



Double - Click Icon

What Happens?

Let's Use a New Function

Open a new file and type the following:



```
*helloworld.py - C:\Users\Daun\Desktop\helloworld.py*
File Edit Format Run Options Windows Help
print("Hello World!")
input("Press Enter to Exit.")
|
Ln: 3 Col: 0
```

The input() function waits for user input and then the enter/return key to be pressed.

You can “pass an argument” that prints a prompt before it waits for the return key.

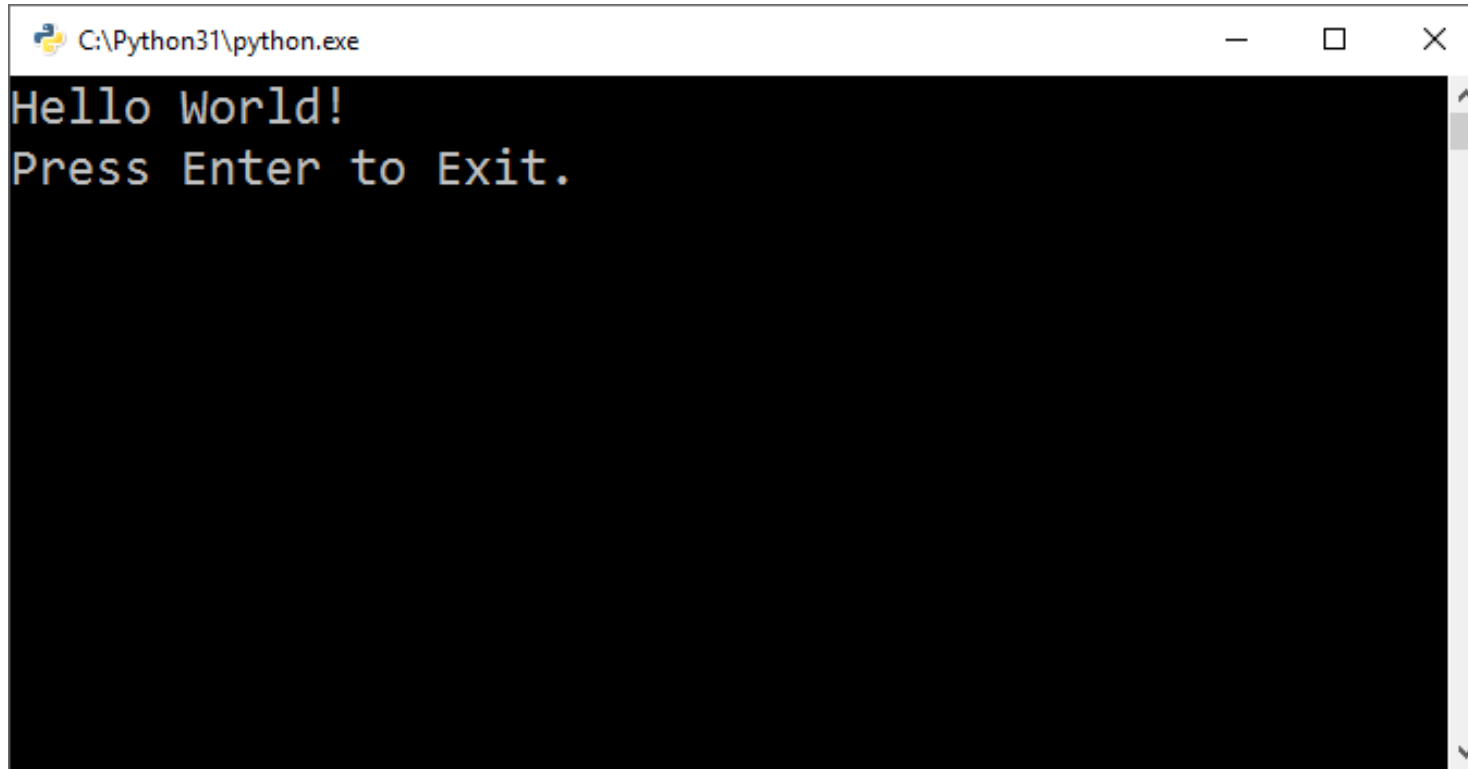
To Run Your Program

Find where you saved the file.



Double - Click Icon

What Happens This Time?

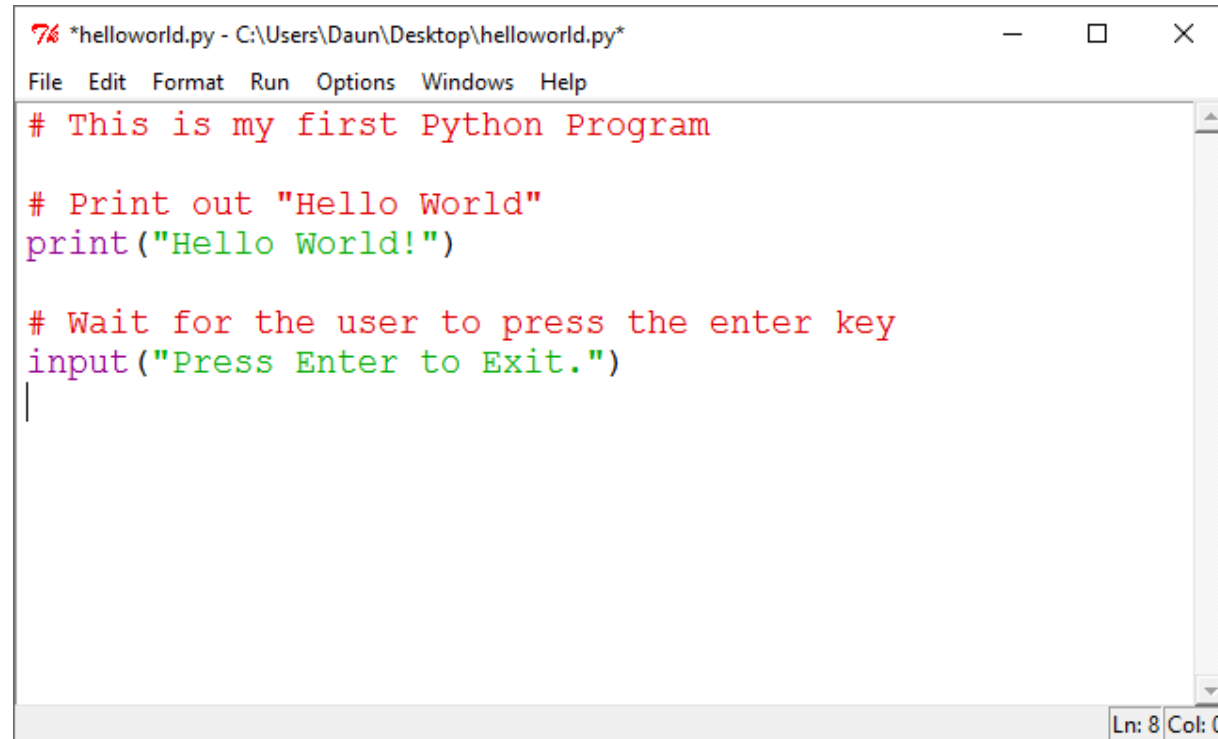


The terminal or console window will remain open until the user hits the Enter key. Then the operating system (Mac or Window or Linux) closes the window.

Let's Add Comments!

Use the # number or hashtag symbol to add a human readable statement

Notice the new color to indicate comments is RED.



```
*helloworld.py - C:\Users\Daun\Desktop\helloworld.py*
File Edit Format Run Options Windows Help
# This is my first Python Program
# Print out "Hello World"
print("Hello World!")
# Wait for the user to press the enter key
input("Press Enter to Exit.")
|
Ln: 8 Col: 0
```

Everything following the # symbol is ignored by Python
But a human programmer can read it for information.

Save & Run Your Program Again ... It should work the same.

What We Learned So Far

- * Python is a powerful easy language to learn programming.
- * Idle - Integrated DeveLopment Environment
- * Idle has two modes:
 1. Interactive Mode :
 - >>> on the screen
 - responds immediately to commands
 2. Script Mode :
 - Use *File->New File* to write a program
- * We learned Two functions :
 - * `print()` : prints out a string
 - * `input()` : asks for input and waits for user to type the Enter key
- * We learned how to add comments
 - * `# this is a human readable comment that Python ignores`

Working Break Time



Write your own Python program that prints out at least two lines.
Be sure to use the `input()` function to wait for the user to press a key.
Run it using both methods.