Python for All Engineers

An Online Continuing Education Course for Engineers

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Python for All Engineers

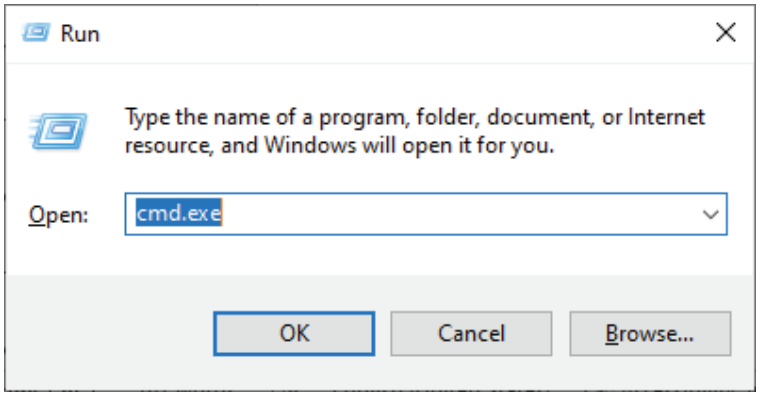
Duane Nickols

Python is one of the top ten computer programming languages. It is an interpreted high-level, general-purpose programming language. Python is easy to learn, but you can get deep into Python. It is cross-platform and open-source. Python can be integrated with other programming languages. It can be used in machine learning as well as computer graphics. It can even be used in web development. It can be used in many ways by engineers.

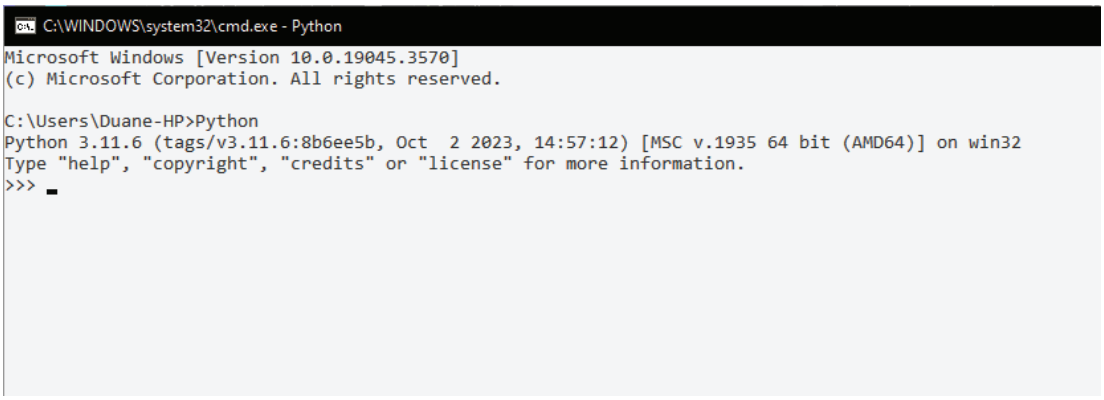
This course is based on a computer running Windows. The easiest way to install Python is to go to the Microsoft Store and install the latest version. You should see older versions as well. You can also go to www.python.org and install it from there. It should have the latest stable version.

If you would rather not install Python, you can use it in your web browser. Search online for JupyterLite, Online Python Interpreter, or Online Python Compiler.

If you installed Python, we are ready to start. Hold the Windows key and press the R key. Then type cmd.exe



Now type Python and you should see the version you installed.



See the three >>>'s. You can write code here, and it will execute immediately. Use exit() or Ctrl-Z, and then the Enter key to exit.

Type this:

```
print("Your name")
```

and then press enter. Note: the word "print" must be all lowercase. A capital "P" will give you an error. Python is case-sensitive.

"print()" is a Python built-in function. For strings (words) you can use single or double quotes inside the parenthesis.

Python has many built-in functions:

Built-in Functions

A
abs()
aiter()
all()
anext()
any()
ascii()

B
bin()
bool()
breakpoint()
bytearray()
bytes()

C
callable()
chr()
classmethod()
compile()
complex()

D
delattr()
dict()
dir()
divmod()

E
enumerate()
eval()
exec()

F
filter()
float()
format()
frozenset()

G
getattr()
globals()

H
hasattr()
hash()
help()
hex()

I
id()
input()
int()
isinstance()
issubclass()
iter()

L
len()
list()
locals()

M
map()
max()
memoryview()
min()

N
next()

O
object()
oct()
open()
ord()

P
pow()
print()
property()

R
range()
repr()
reversed()
round()

S
set()
setattr()
slice()
sorted()
staticmethod()
str()
sum()
super()

T
tuple()
type()

V
vars()

Z
zip()

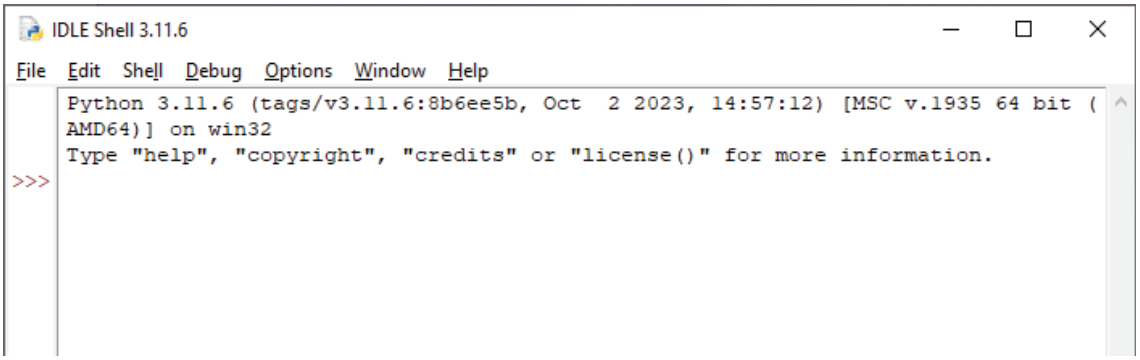
_
__import__()

You can see many valuable functions used in engineering, like abs, ascii, bool, chr, float, format, hex, input, int, oct, pow, print, round, str, sum, and others. We will use some of these.

There is a better way to use Python. Python has its own Integrated Development Environment (IDE). It is called IDLE. It was installed when you installed Python. There are many other IDE's that you can use. The two I mentioned above (search for JupyterLite or Online Python Compiler). Search for Python IDE's like Pycharm, Jupyter Notebook, Pydev, VS Code and Spyder.

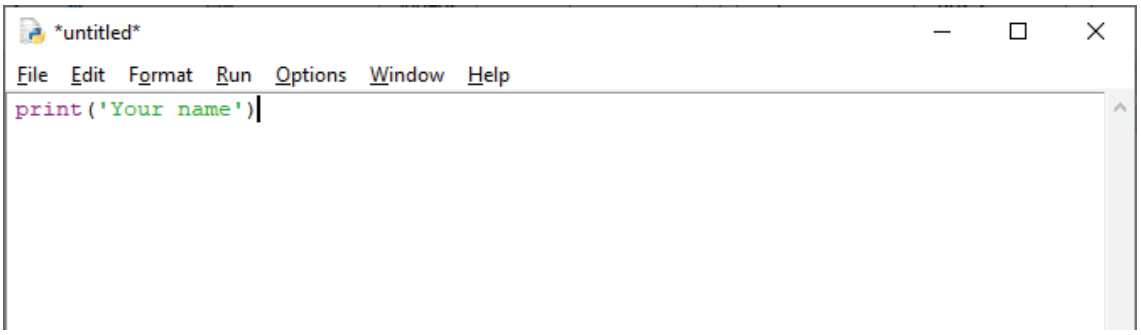
We will be using IDLE, JupyterLite or any Online Python Compiler in this course.

IDLE looks like this:



When you open IDLE, you will be in the Shell just like with cmd. You will see the same >>>'s. You can type: print('Your name') just like we did before.

Click File and New to open a new window where we write our code. You can run your code here but save it first with a ".py" extension.



IDLE, Online Python Compiler, and JupyterLite color codes your code.

Help is always available on basic Python in the shell.

>>>help(print)

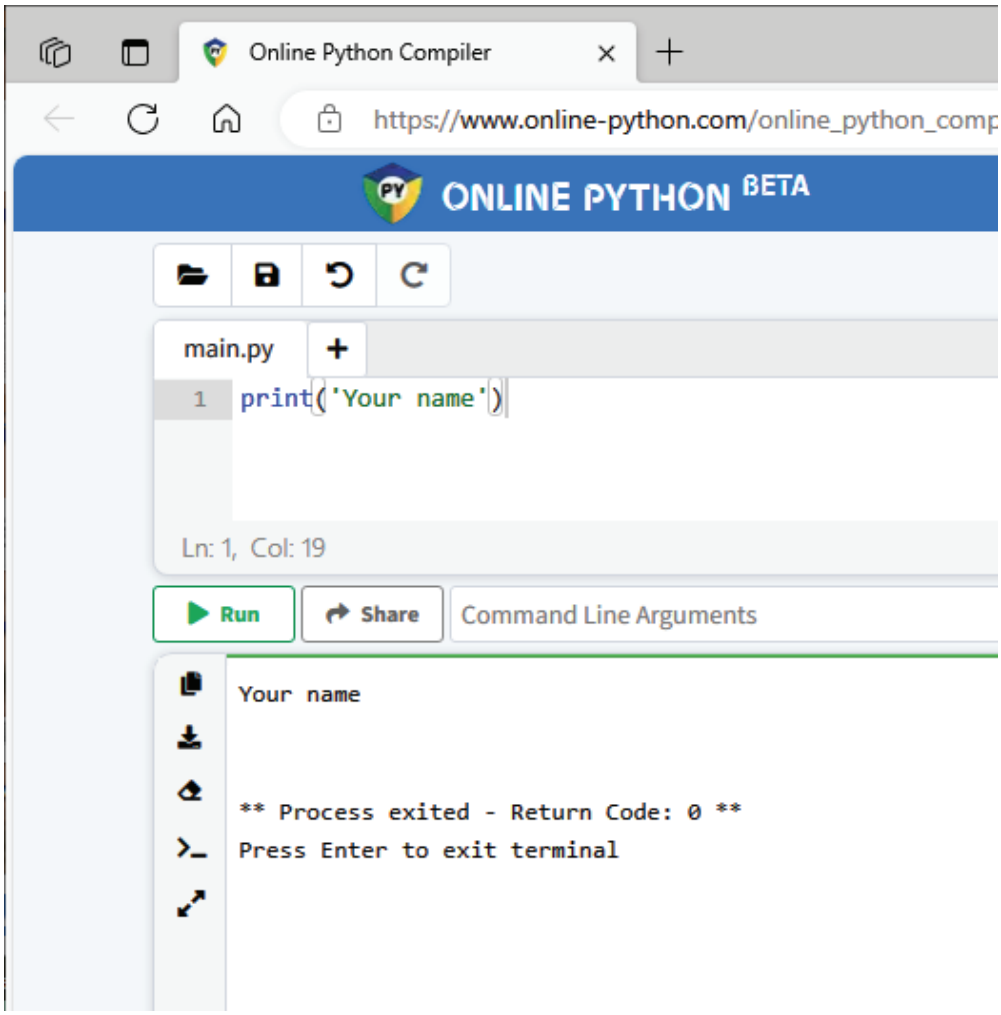
```
help(print)

Help on built-in function print in module builtins:

print(*args, sep=' ', end='\n', file=None, flush=False)
    Prints the values to a stream, or to sys.stdout by default.

    sep
      string inserted between values, default a space.
    end
      string appended after the last value, default a newline.
    file
      a file-like object (stream); defaults to the current sys.stdout.
    flush
      whether to forcibly flush the stream.
```

The Online Python Compiler looks like this:



You write your code in the top section and your run is in the bottom section instead of two windows as in IDLE. This is nice because you can see both the program and the run at the same time. You can save your program (module) with a .py extension. You can type help() in the top and then run.. Click >_ to start the terminal or shell. You will see >>>'s and you can type help() here. Use exit() or Ctrl-D to exit the terminal or shell.

JupyterLite looks like this: