



Who Uses  
Programming?

# How Can Programming Help *Your* Career?

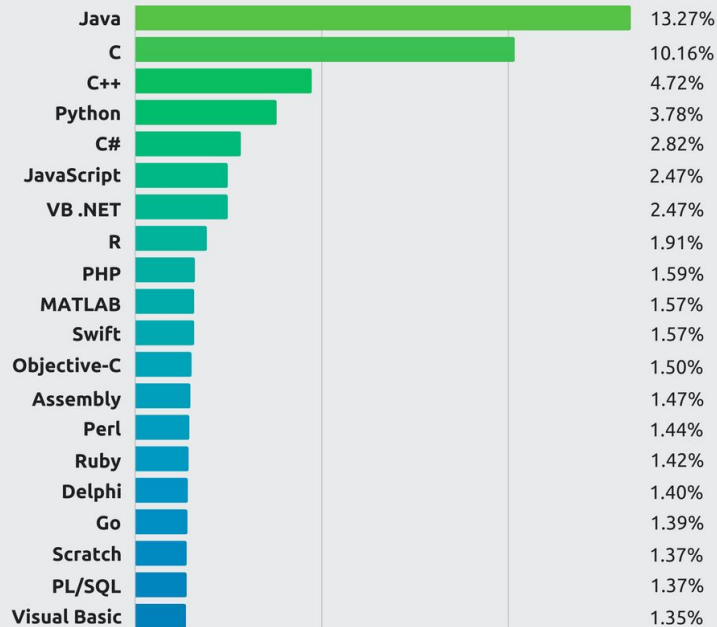
## Some Examples Include:

- ❑ **Business:** Marketing Data Analysis, Prototyping Tools
- ❑ **Banking / Commerce:** Online Banking, Automated accounting tools, A.I. Stock Trading
- ❑ **Science:** Data Analysis & Data Visualization, Macro & Micro Biology Simulations, Mapping
- ❑ **Engineering:** Physics Simulations, Stress Testing, Robotics
- ❑ **TV & Film Editing:** Writing code for video encoding or image processing
- ❑ **Politics:** Polling Systems, Processing Survey Data

# Examples of Programming Languages

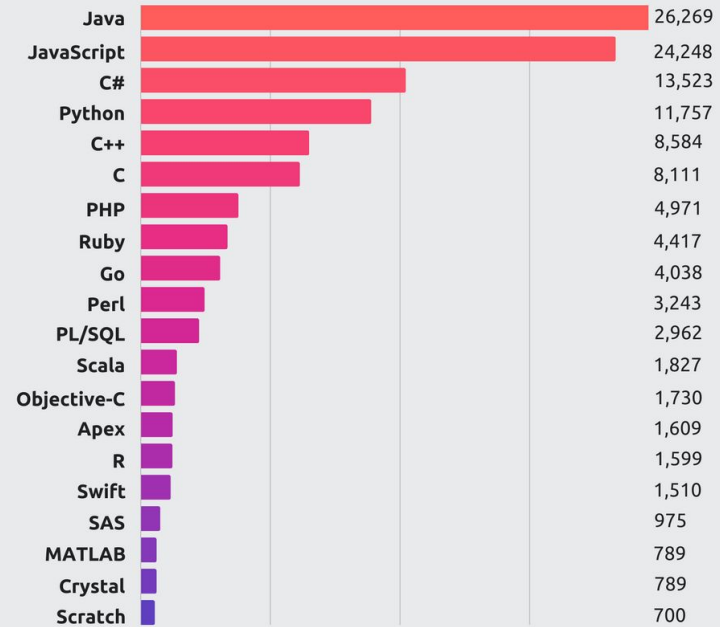
## Top Programming Languages

Tiobe Index - December 2017

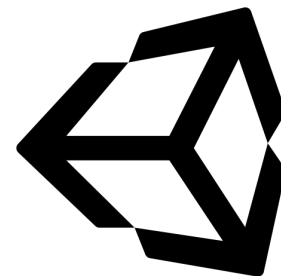


## Most In-Demand Languages

Indeed Job Openings - Dec. 2017



# Programming Languages in Action



**Unity Game Engine**

Languages Used:

- ☐ C#
- ☐ Javascript

# Programming Languages in Action



Game: The Vanishing of Ethan Carter



Languages Used:

❑ C++

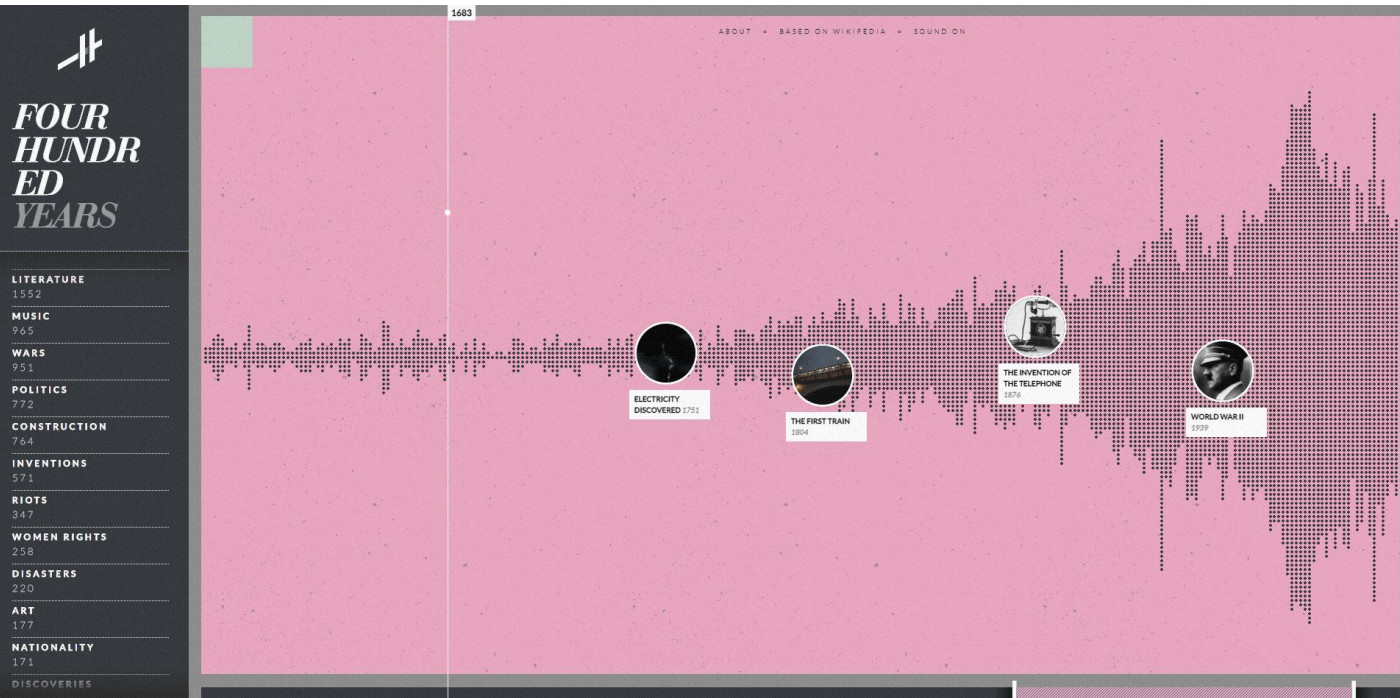
# Programming Languages in Action



Languages Used:

☐ Java

# Programming Languages in Action



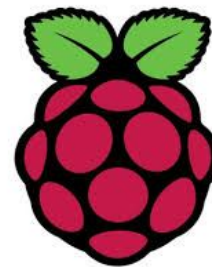
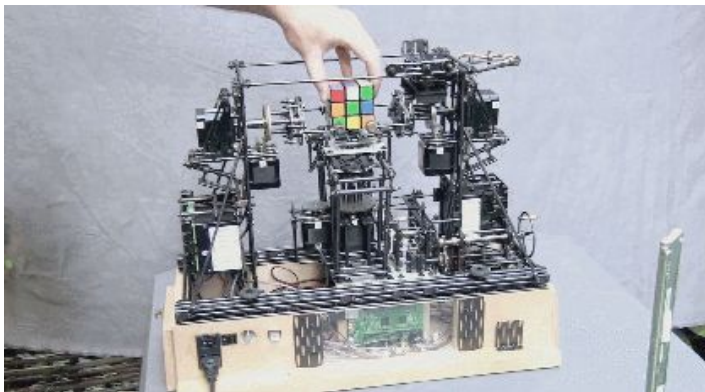
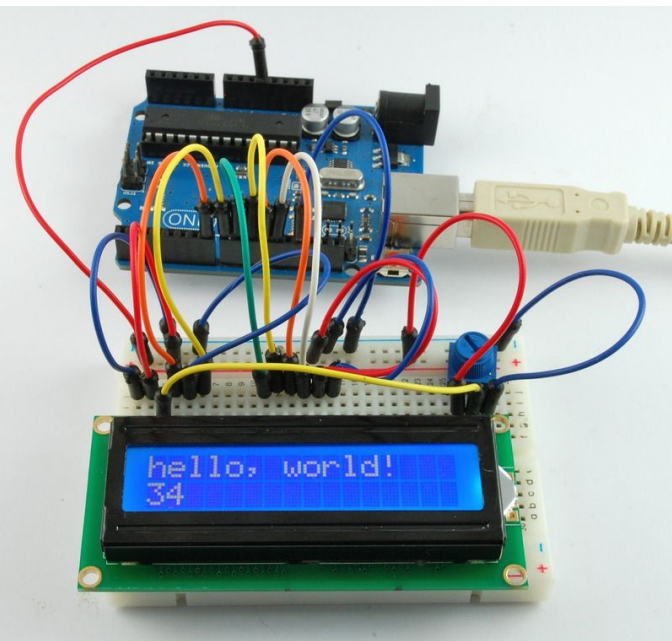
**Most Websites**

Languages Used:

❏ Javascript

<http://www.histogrampy.io/>

# Programming Languages in Action



**Raspberry Pi**

portable computer  
devices and robotics

Languages Used:

❑ Python

# Programming Languages in Action



(video compositing / editing)

Languages Used:

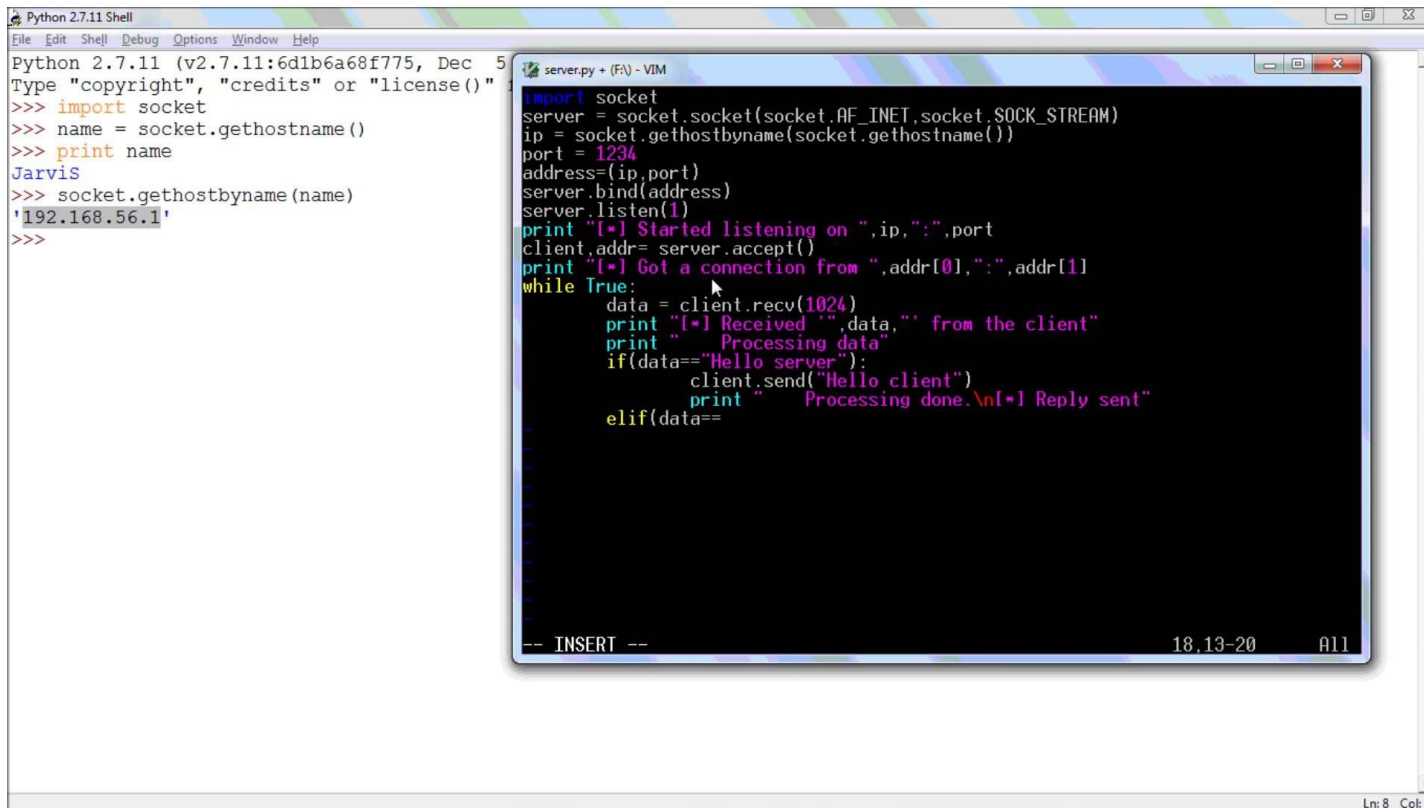
☐ Python

# Programming Languages in Action

## Web Servers

### Languages Used:

- ☐ PHP
- ☐ ASP.NET (C# OR Visual Basic)
- ☐ C++
- ☐ Java and JSP.
- ☐ Ruby on Rails
- ☐ Python.



The image shows a screenshot of a Python 2.7.11 Shell window and a VIM editor window. The shell window displays the execution of a Python script that imports the socket module, gets the host name, and prints it. The output shows the host name as '192.168.56.1'. The VIM editor window shows the code for a simple socket server. The server binds to the host's IP and port 1234, listens for connections, and then enters a loop where it accepts connections, receives data, and prints it. If the received data is 'Hello server', it sends back 'Hello client'. Otherwise, it sends back 'Processing done.\nI Reply sent'.

```
Python 2.7.11 Shell
File Edit Shell Debug Options Window Help
Python 2.7.11 (v2.7.11:6d1b6a68f775, Dec 5
Type "copyright", "credits" or "license()"
>>> import socket
>>> name = socket.gethostname()
>>> print name
Jarvis
>>> socket.gethostname(name)
'192.168.56.1'
>>>

server.py + (FA) - VIM
import socket
server = socket.socket(socket.AF_INET,socket.SOCK_STREAM)
ip = socket.gethostbyname(socket.gethostname())
port = 1234
address=(ip,port)
server.bind(address)
server.listen(1)
print "[*] Started listening on ",ip,":",port
client,addr= server.accept()
print "[*] Got a connection from ",addr[0]," :",addr[1]
while True:
    data = client.recv(1024)
    print "[*] Received '",data,"' from the client"
    print "    Processing data"
    if(data=="Hello server"):
        client.send("Hello client")
        print "    Processing done.\nI Reply sent"
    elif(data==
-- INSERT --
18,13-20 All
Ln: 8 Col: 1
```

# A lot of companies are using Python!



## Who uses Python

---



Instagram

Google

Pinterest



# Programming In Python



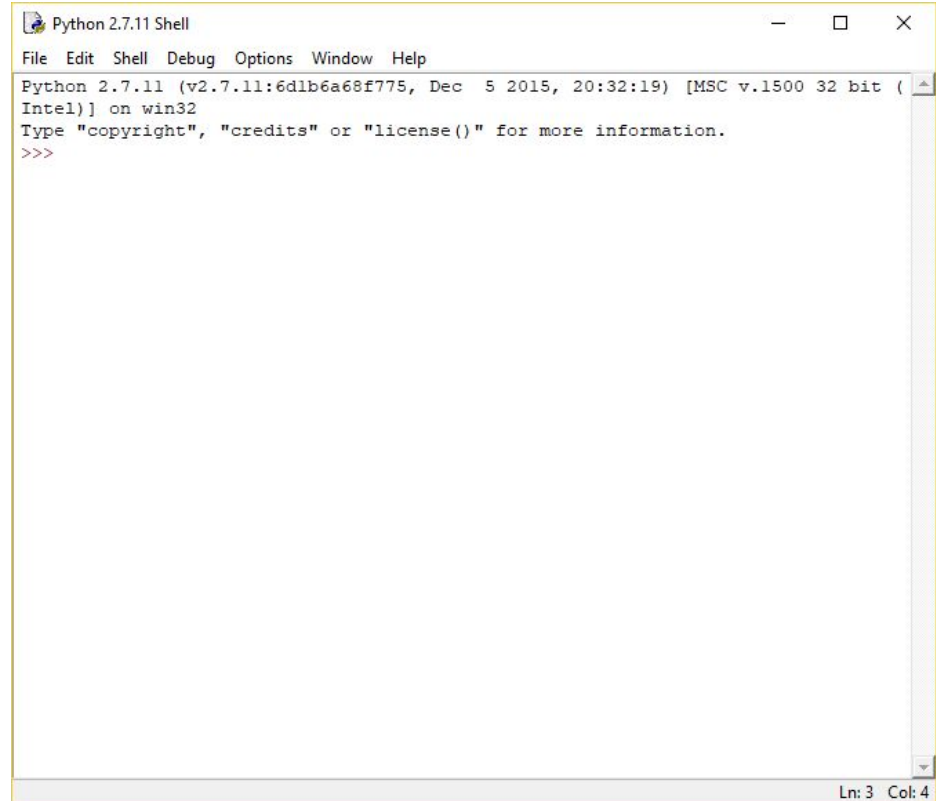
# Today's Learning Goals

- ❑ I can create and run script files in the Python script editor (IDLE)
- ❑ I can write a program that generates output

# The Python Editor (IDLE)

## 1. Python Shell

Similar to the command line or terminal on your computer.  
Type a single command and hit ENTER to execute it.

A screenshot of the Python 2.7.11 Shell window. The window has a title bar that says "Python 2.7.11 Shell" and standard window controls (minimize, maximize, close). Below the title bar is a menu bar with "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main area of the window contains the following text: "Python 2.7.11 (v2.7.11:6d1b6a68f775, Dec 5 2015, 20:32:19) [MSC v.1500 32 bit (Intel)] on win32", "Type \"copyright\", \"credits\" or \"license()\" for more information.", and a prompt ">>>". The status bar at the bottom right shows "Ln: 3 Col: 4".

```
Python 2.7.11 Shell
File Edit Shell Debug Options Window Help
Python 2.7.11 (v2.7.11:6d1b6a68f775, Dec 5 2015, 20:32:19) [MSC v.1500 32 bit (
Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
```

Ln: 3 Col: 4

# Python “Scripts”

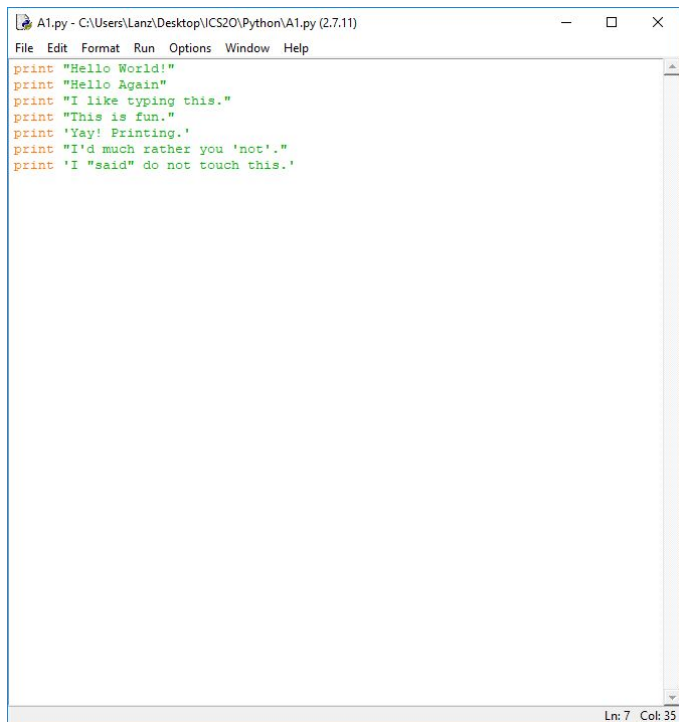
The document that holds the code for your program is called a script.

Python scripts are saved with a **.py** file extension.



# 2 Ways to Make Python Scripts

## 1. Use the Python Script Editor

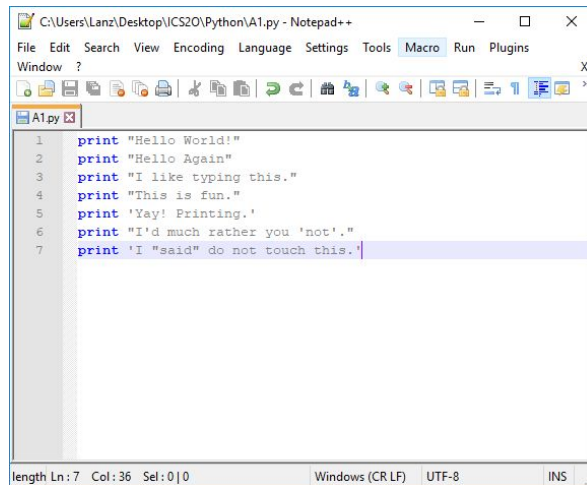


```
A1.py - C:\Users\Lanz\Desktop\ICS20\Python\A1.py (2.7.11)
File Edit Format Run Options Window Help
print "Hello World!"
print "Hello Again"
print "I like typing this."
print "This is fun."
print 'Yay! Printing.'
print "I'd much rather you 'not'."
print 'I "said" do not touch this.'
Ln: 7 Col: 35
```

script  
tabs!

Line  
numbers!

## Use Notepad++ or TextWrangler

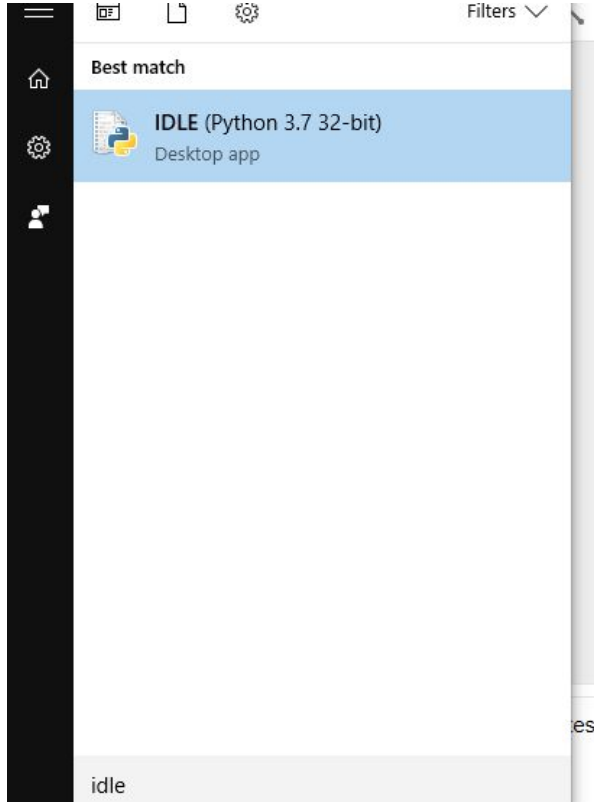


```
C:\Users\Lanz\Desktop\ICS20\Python\A1.py - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins
Window ?
A1.py
1 print "Hello World!"
2 print "Hello Again"
3 print "I like typing this."
4 print "This is fun."
5 print 'Yay! Printing.'
6 print "I'd much rather you 'not'."
7 print 'I "said" do not touch this.'
length Ln: 7 Col: 36 Sel: 0 | 0 Windows (CR LF) UTF-8 INS
```

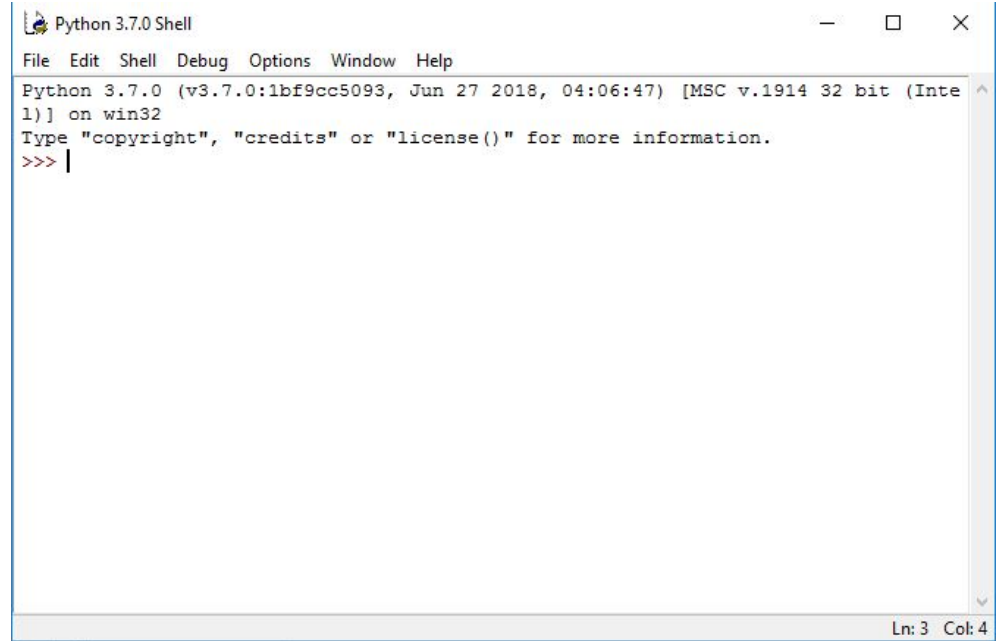
For TextWrangler you will want to turn on  
“show line numbers”

<http://osxdaily.com/2010/08/26/show-line-numbers-in-textwrangler/>

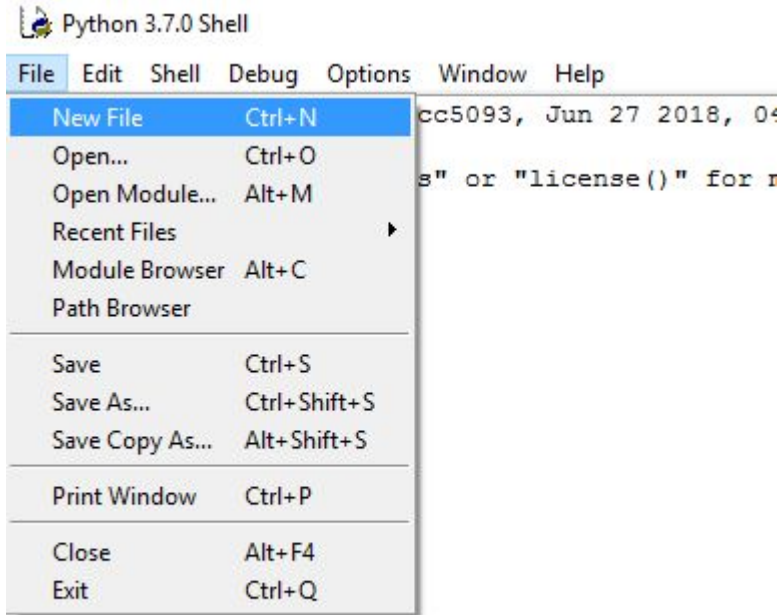
# 1. Open IDLE



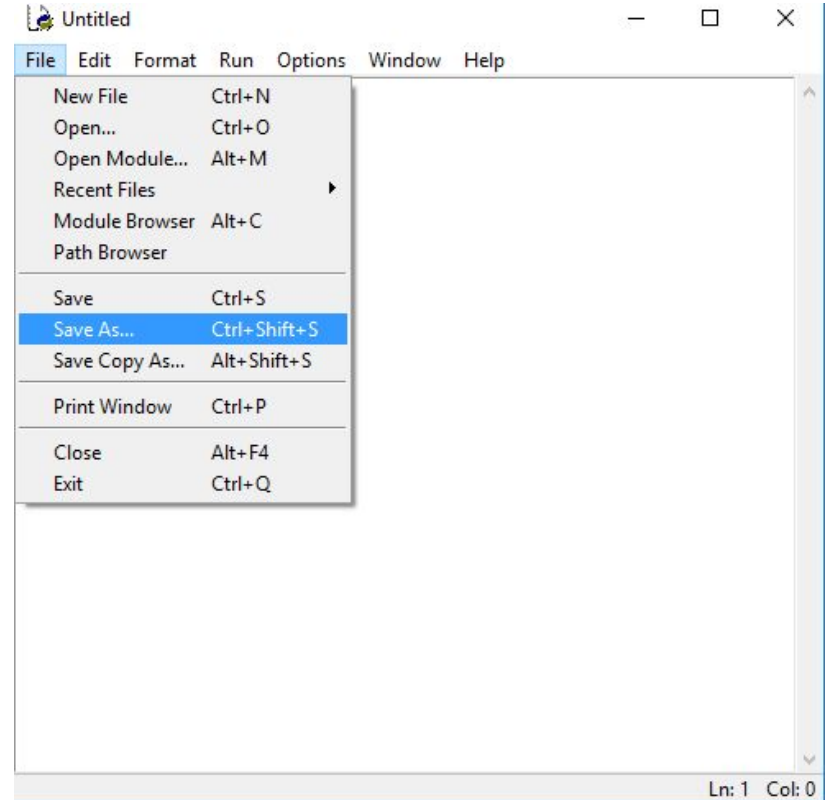
# 2. Python Shell will load



### 3. Open a new script window



### 4. Save the script file



## 5. Start writing some code



The screenshot shows a window titled `*mrsingbeil_helloworld_period3.py - D:/lanzs/Des...`. The menu bar includes `File`, `Edit`, `Format`, `Run`, `Options`, `Window`, and `Help`. The code editor contains the line `print("hello world!")` with a cursor at the end. The status bar at the bottom right indicates `Ln: 1 Col: 21`.

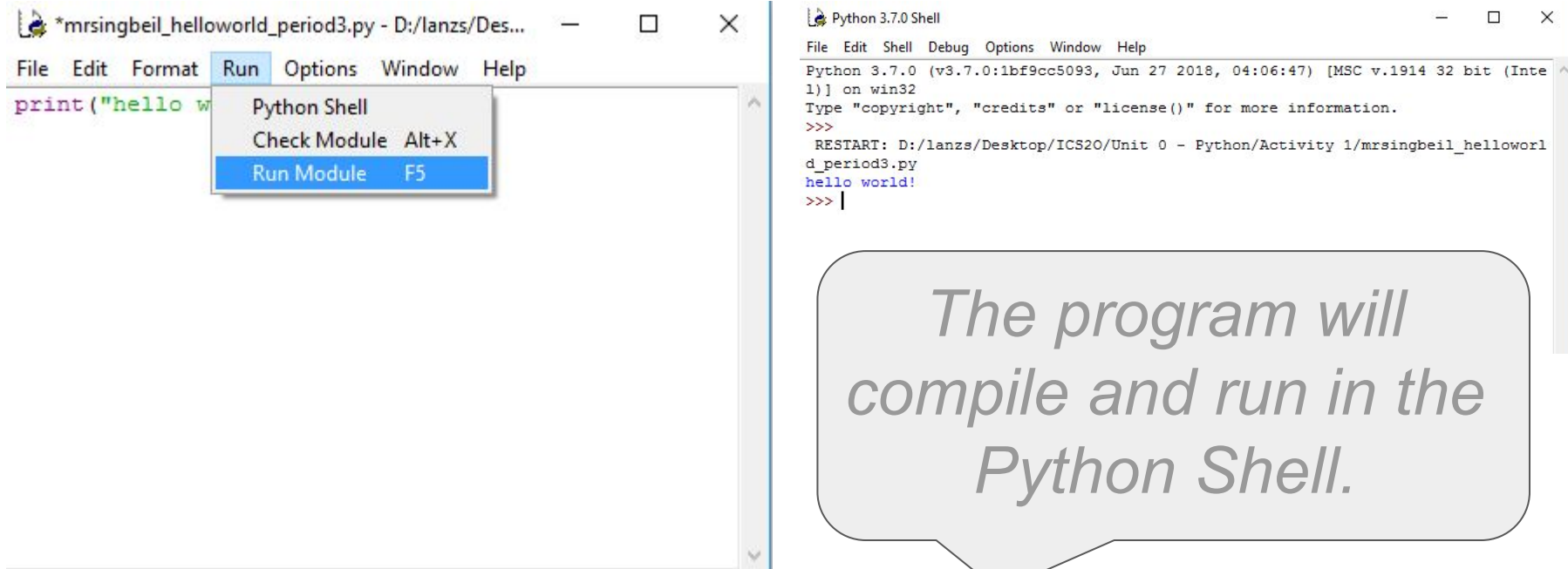
```
print("hello world!")
```

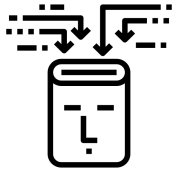
This code will output a message to the console when the program runs.

`print()` is a function that handles output.

The message contents is written between two quotation marks “...” or two apostrophes ‘...’

## 6. Run your program: Run > Run Module





# Programming Activity 1: Text Art

Create a “Hello World” Program.

Filename should be: YourName\_helloworld.py

**Line 1:** should say “Hello World!”

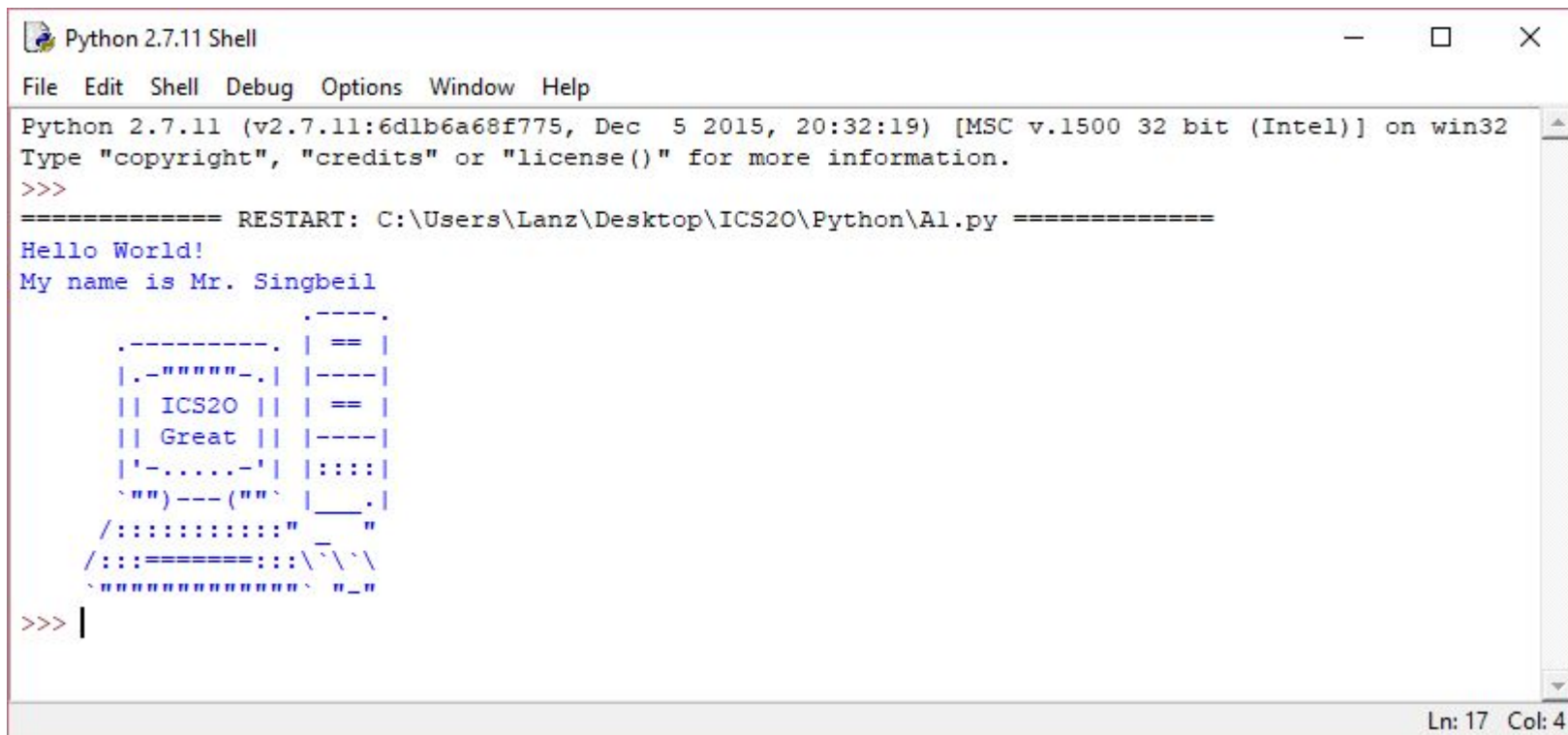
**Line 2:** should say “My name is <your name>”

**Lines 3 → End:** Print out an ASCII drawing by using multiple print() commands.

Must be an ORIGINAL design  
(no copying from websites!)

Must be at least 10 lines high and 10  
characters wide but bigger is better!

# Text Art: Sample Output

A screenshot of a Python 2.7.11 Shell window. The window has a title bar with the icon and text 'Python 2.7.11 Shell', and standard minimize, maximize, and close buttons. Below the title bar is a menu bar with 'File', 'Edit', 'Shell', 'Debug', 'Options', 'Window', and 'Help'. The main text area shows the following output:

```
Python 2.7.11 (v2.7.11:6d1b6a68f775, Dec 5 2015, 20:32:19) [MSC v.1500 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\Lanz\Desktop\ICS20\Python\A1.py =====
Hello World!
My name is Mr. Singbeil

      .----.
    .-----| == |
  |.-"-----| |----| | |
  || ICS20 || | == |
  || Great || |----|
  |-.....-| |:::|
  `""`---(`""` |___.|
 /:~::~::~::~:"  _"
/:~::~::~::~::~:\`\\`\\
`~::~::~::~::~::~`  "_`

>>> |
```

The text art is a rectangular frame made of dashes and dots. Inside the frame, the text 'ICS20' and 'Great' are displayed on two lines. The frame is decorated with various symbols like dots, dashes, and backslashes. The window's status bar at the bottom right shows 'Ln: 17 Col: 4'.

# The Python Basics Videos

There are so many resources out there to help us learn Python. Here's a good playlist you can use if you are finding things a bit tricky in class:



<https://www.youtube.com/playlist?list=PL82YdDfxhWsDJTq5f0Ae7M7yGcA26wevJ>