

# Setting up Python on Windows x64

Includes installing:

- Python 3.6
- Notepad Plus  
Plus
- Jupyter Notebook
- PyInstaller

Hamilton Python Users Group

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12-March-2018.

Slide Show is intended as a reference document.

<https://github.com/HamPUG/meetings/tree/master/2018/2018-03-12>

# Objective:

## Python development environment for Windows

Desktop with Python installed.

Jupyter Notebook  
Develop / Test Code  
snippets.

Notebook++  
Main Program source  
code

File Manager or CMD  
console  
to Run Program

PyInstaller -  
Distribution

# Installing Python3

Go to [www.python.org](https://www.python.org/)

Click : Downloads

The screenshot shows a web browser window with the Python.org homepage loaded. The address bar at the top displays the URL <https://www.python.org/>. The page title is "Welcome to Python.org". The navigation menu includes File, Edit, View, Favorites, Tools, Help, Suggested Sites, Web Slice Gallery, and various links for Python, PSF, Docs, PyPI, Jobs, and Community. A search bar with a magnifying glass icon and a "GO" button is located on the right side of the header. Below the header, the Python logo is prominently displayed next to the word "python". A navigation bar at the bottom offers links for About, Downloads, Documentation, Community, Success Stories, News, and Events. On the left, there is a code snippet in Python syntax:

```
# Python 3: Fibonacci series up to n
>>> def fib(n):
>>>     a, b = 0, 1
>>>     while a < n:
>>>         print(a, end=' ')
>>>         a, b = b, a+b
```

A yellow button with a right-pointing arrow is positioned next to the code snippet. To the right of the code, a section titled "Functions Defined" is shown with the following text:

The core of extensible programming is defining functions. Python allows mandatory and optional arguments, keyword arguments, and even arbitrary argument lists. [More about defining functions in Python 3](#)

# Installing Python3

Click: Python for Windows

The screenshot shows a web browser window with the URL <https://www.python.org/downloads/> in the address bar. The page content is the Python Downloads page. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, Help, Suggested Sites, and Web Slice Gallery. Below the navigation bar are tabs for Python, PSF, Docs, PyPI, Jobs, and Community. On the left, the Python logo is displayed next to the word "python™". To the right is a search bar with a magnifying glass icon and a "GO" button. Below the search bar is a horizontal menu with links for About, Downloads, Documentation, Community, Success Stories, News, and Events. A large yellow call-to-action button at the bottom left says "Download the latest version for Windows" with two sub-options: "Download Python 3.6.4" and "Download Python 2.7.14". Below this, a section asks "Wondering which version to use? Here's more about the difference between Python 2 and 3." To the right of this text is a graphic of two parachutes descending from the sky, each carrying a small wooden box.

https://www.python.org/downloads/

Identified by DigiCert

Search...

File Edit View Favorites Tools Help

Suggested Sites Web Slice Gallery

Python PSF Docs PyPI Jobs Community

python™

About Downloads Documentation Community Success Stories News Events

Download the latest version for Windows

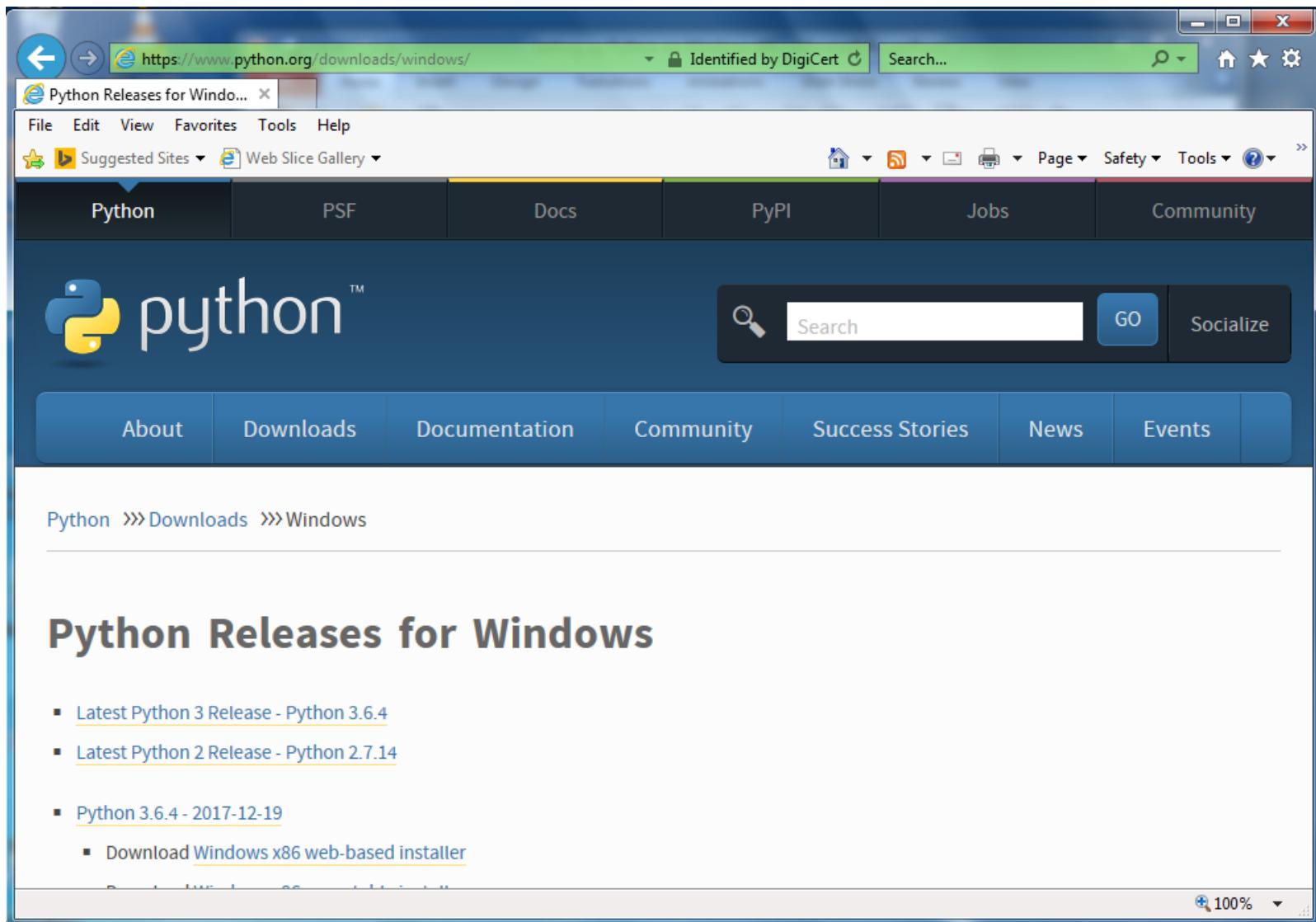
Download Python 3.6.4 Download Python 2.7.14

Wondering which version to use? Here's more about the difference between Python 2 and 3.

Looking for Python with a different OS? Python for Windows, Linux/UNIX, Mac OS X, Other

# Installing Python3

Scroll down on this window...



The screenshot shows a Microsoft Internet Explorer browser window displaying the Python.org website. The URL in the address bar is <https://www.python.org/downloads/windows/>. The page title is "Python Releases for Windows". The browser interface includes standard buttons for back, forward, search, and refresh, along with a status bar at the bottom showing "Identified by DigiCert" and a zoom level of "100%".

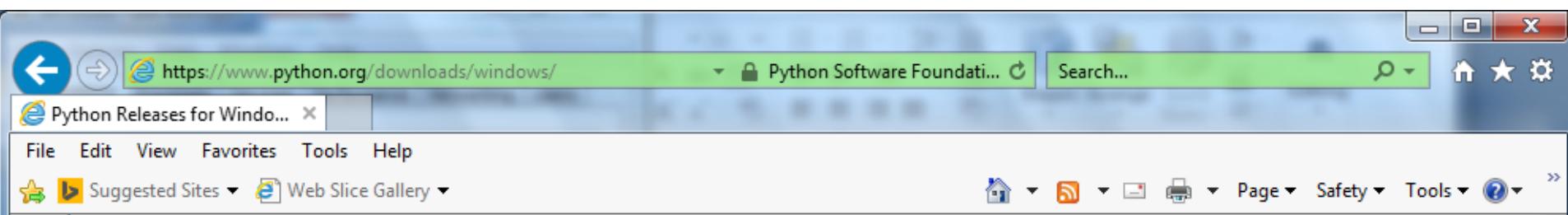
The main content area features the Python logo and the word "python" in white on a dark blue background. Below this is a navigation menu with links: About, Downloads, Documentation, Community, Success Stories, News, and Events. The "Downloads" link is currently highlighted.

The main heading on the page is "Python Releases for Windows". Below it is a list of download options:

- [Latest Python 3 Release - Python 3.6.4](#)
- [Latest Python 2 Release - Python 2.7.14](#)
- [Python 3.6.4 - 2017-12-19](#)
  - [Download Windows x86 web-based installer](#)

# Installing Python3

Click: Download Windows x86-64 executable installer



## Python Releases for Windows

- [Latest Python 3 Release - Python 3.6.4](#)
- [Latest Python 2 Release - Python 2.7.14](#)
- [Python 3.6.4 - 2017-12-19](#)
  - Download [Windows x86 web-based installer](#)
  - Download [Windows x86 executable installer](#)
  - Download [Windows x86 embeddable zip file](#)
  - Download [Windows x86-64 web-based installer](#)
  - Download [Windows x86-64 executable installer](#)
  - Download [Windows x86-64 embeddable zip file](#)
  - Download [Windows help file](#)

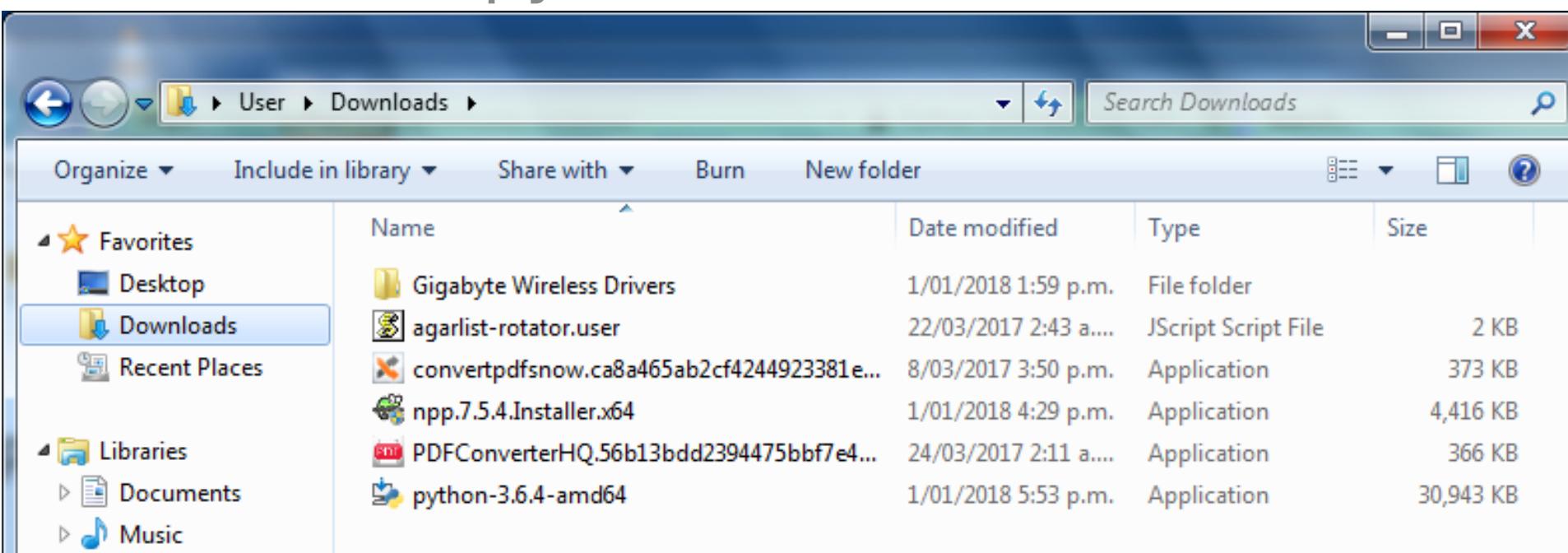
# Installing Python3

Click: Save



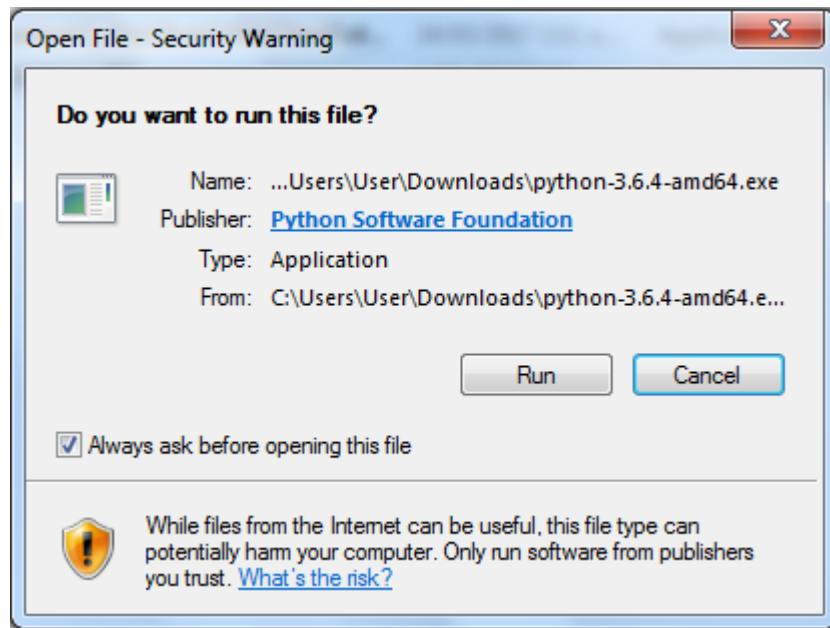
Go to downloads folder

Double Click: python-3.6.4-amd64



# Installing Python3

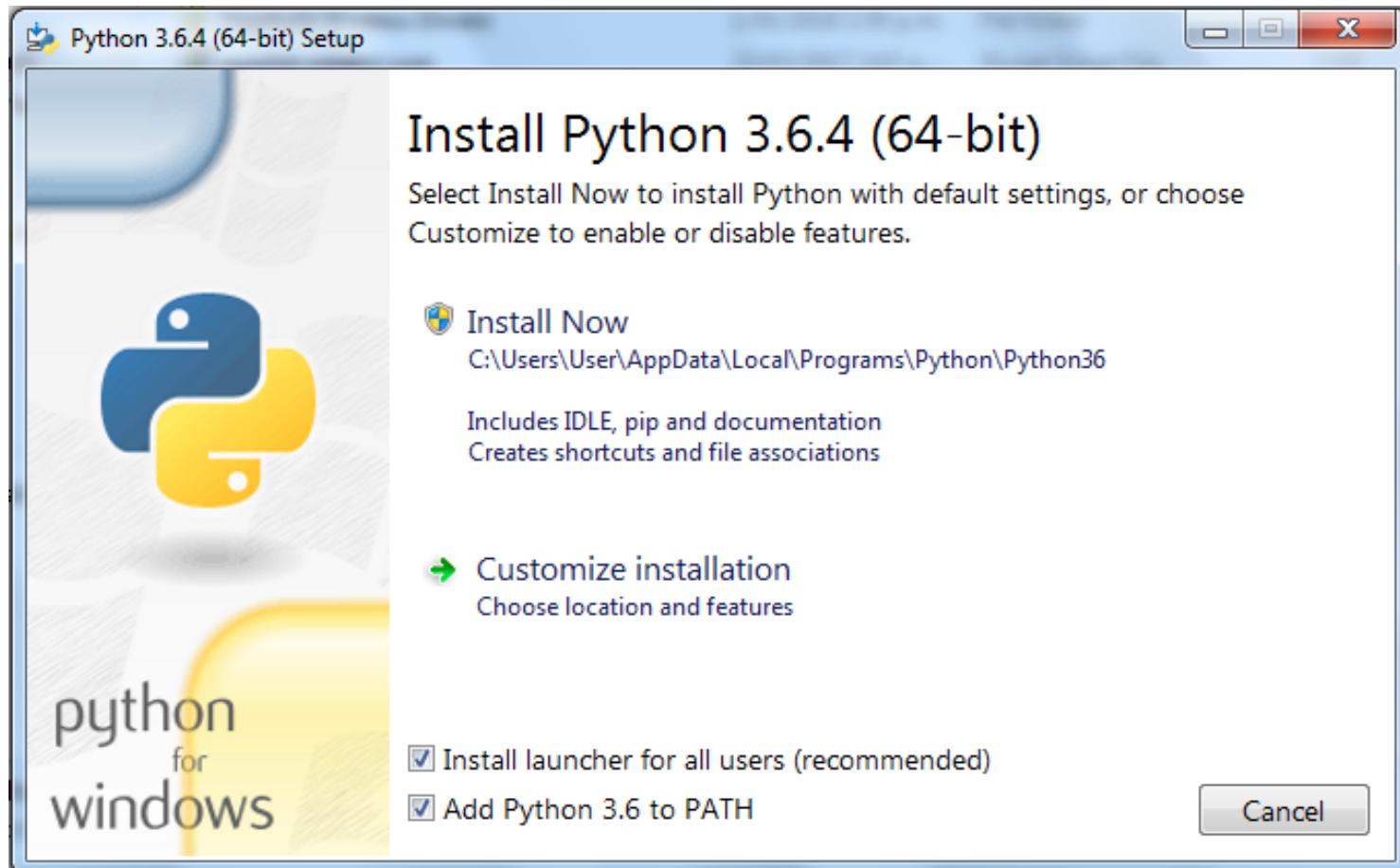
Click: Run



# Installing Python3

Checkbox: Add Python 3.6 to PATH

Click: Install Now

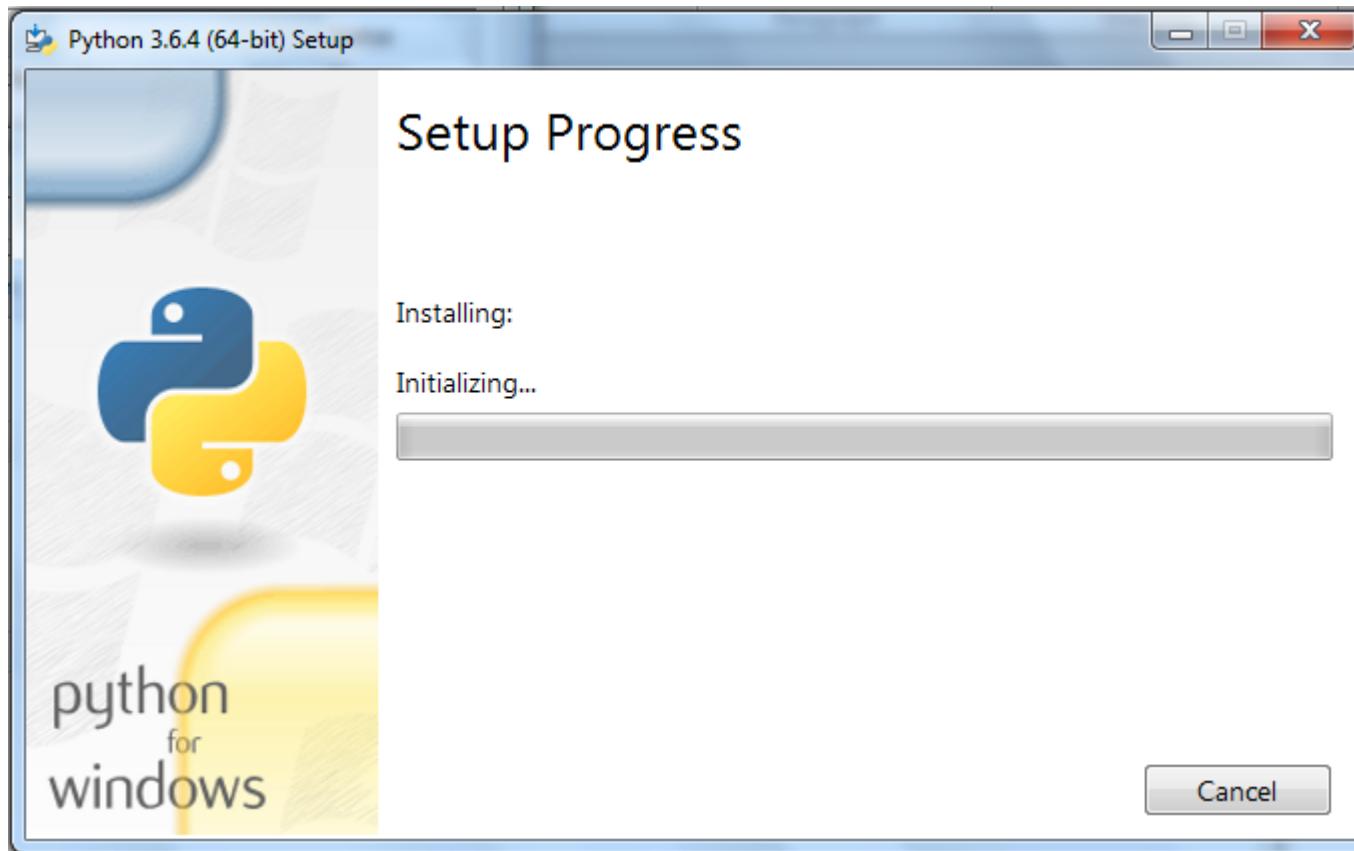


Installs into...

C:\Users\User\AppData\Local\Programs\Python\Python36

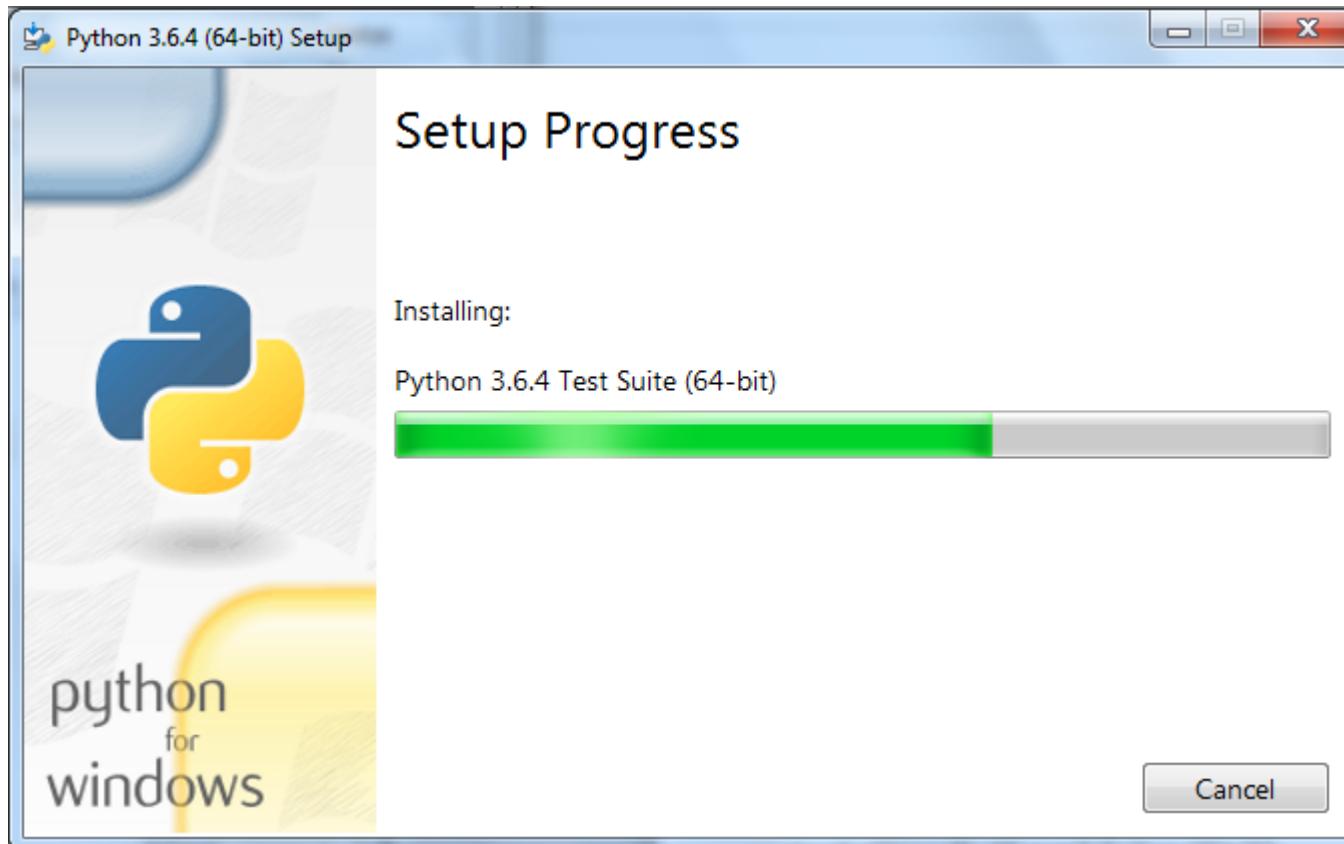
# Installing Python3

## Initializing



# Installing Python3

Install in progress...



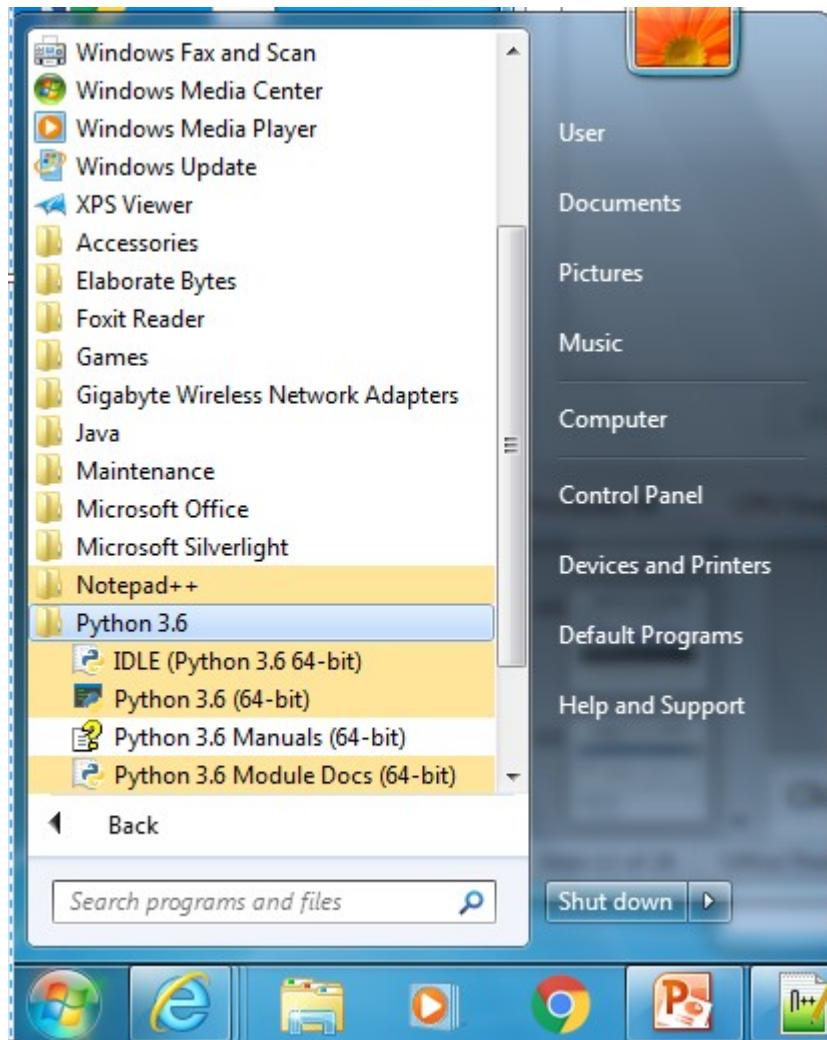
# Installing Python3

Click: Close



# Review of Python3

Click: Start. Python3.6 folder now exists.

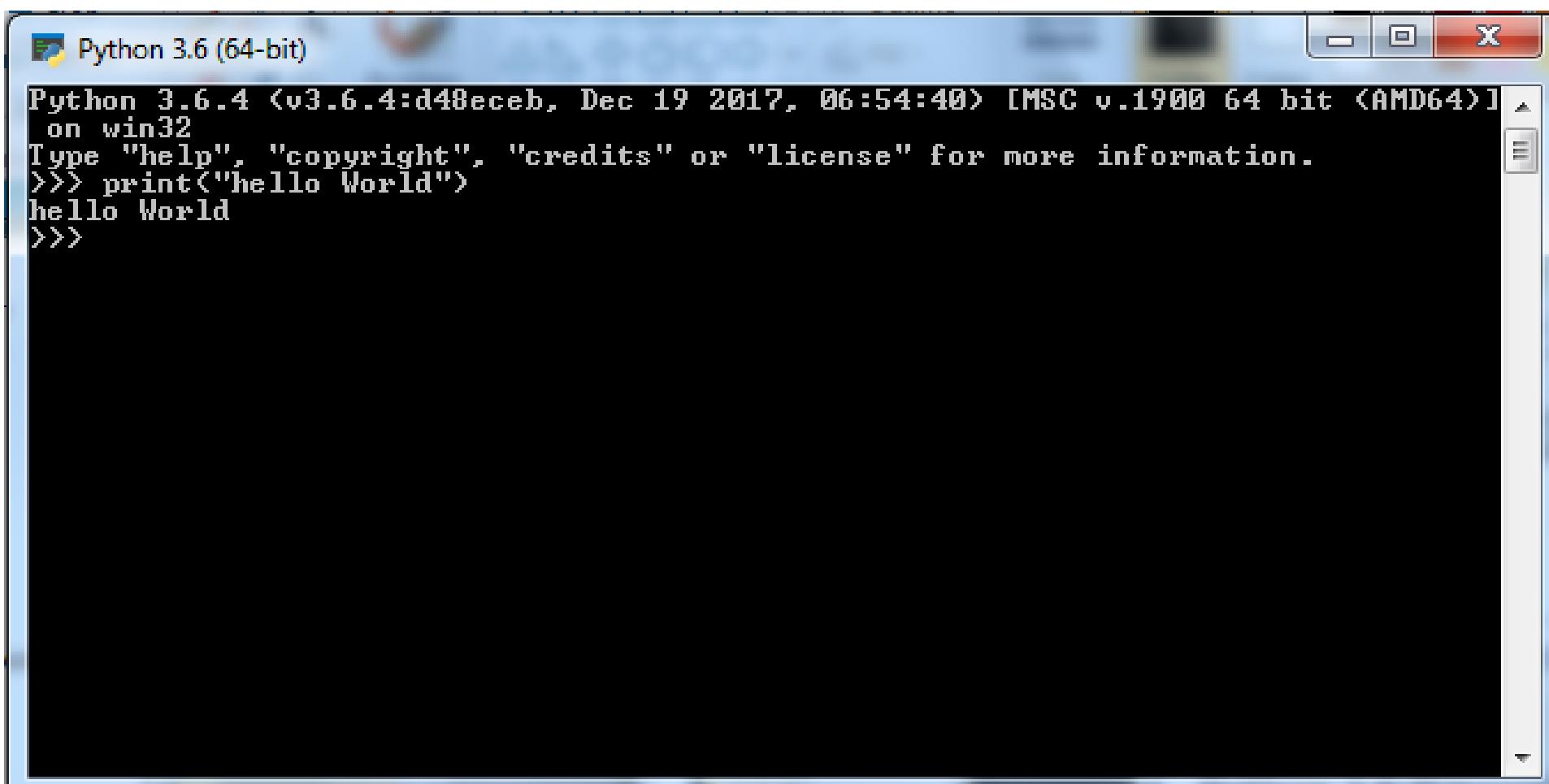


Python3.6 folder  
contains:

- IDLE (IDE)
- Python 3.6 (Console)
- Python3.6 Manuals
- Python3.6 Module Docs

# Review of Python3

Click: Python3.6 for Console Window.  
Allows interactive entry of code...



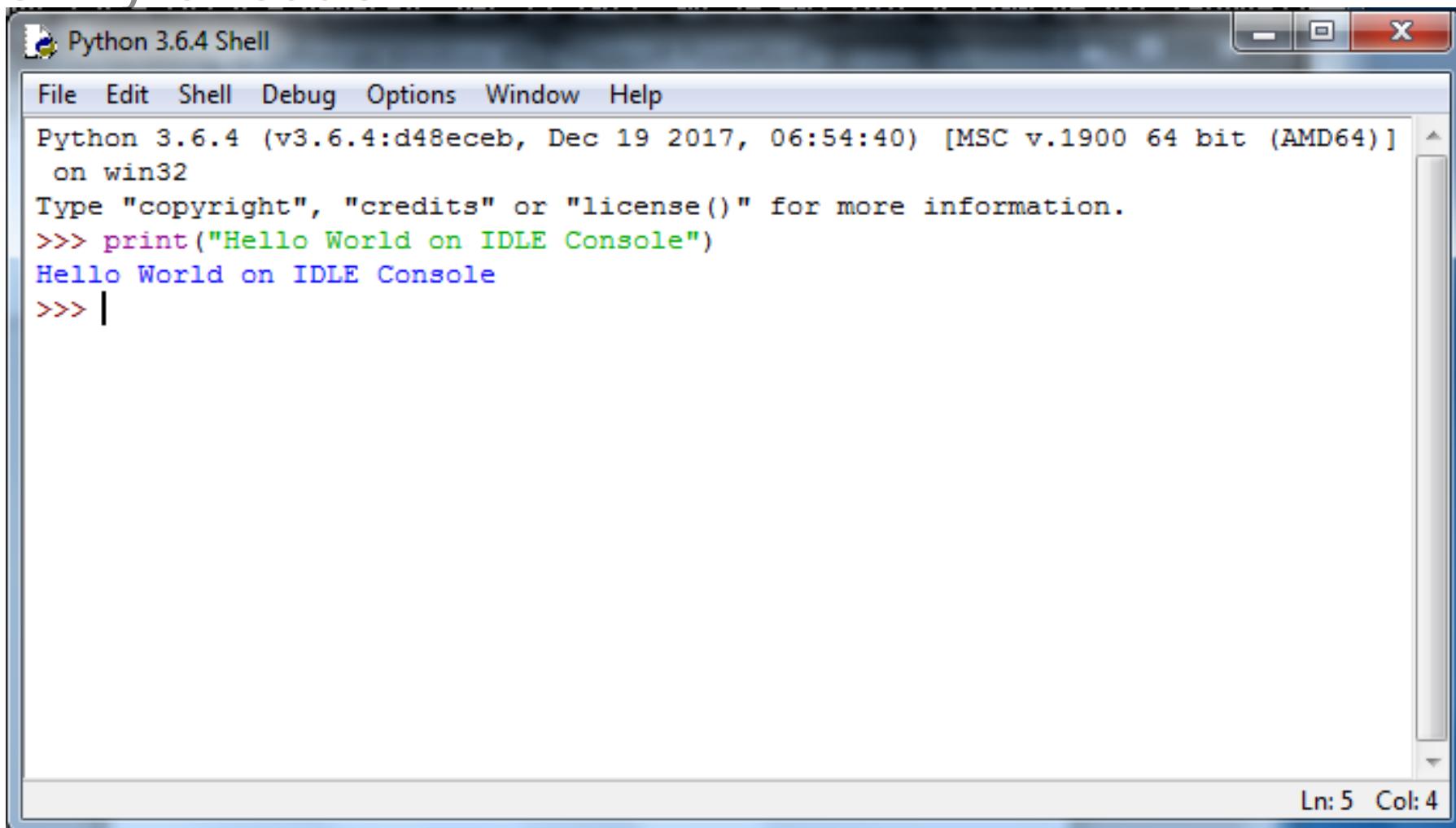
The screenshot shows a Windows Command Prompt window titled "Python 3.6 (64-bit)". The window contains the following text:

```
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]  
on win32  
Type "help", "copyright", "credits" or "license" for more information.  
>>> print("Hello World")  
Hello World  
>>>
```

# Review of Python3

Click: Python3.6 IDLE.

Launch IDLE Shell window. Allows interactive entry of code...



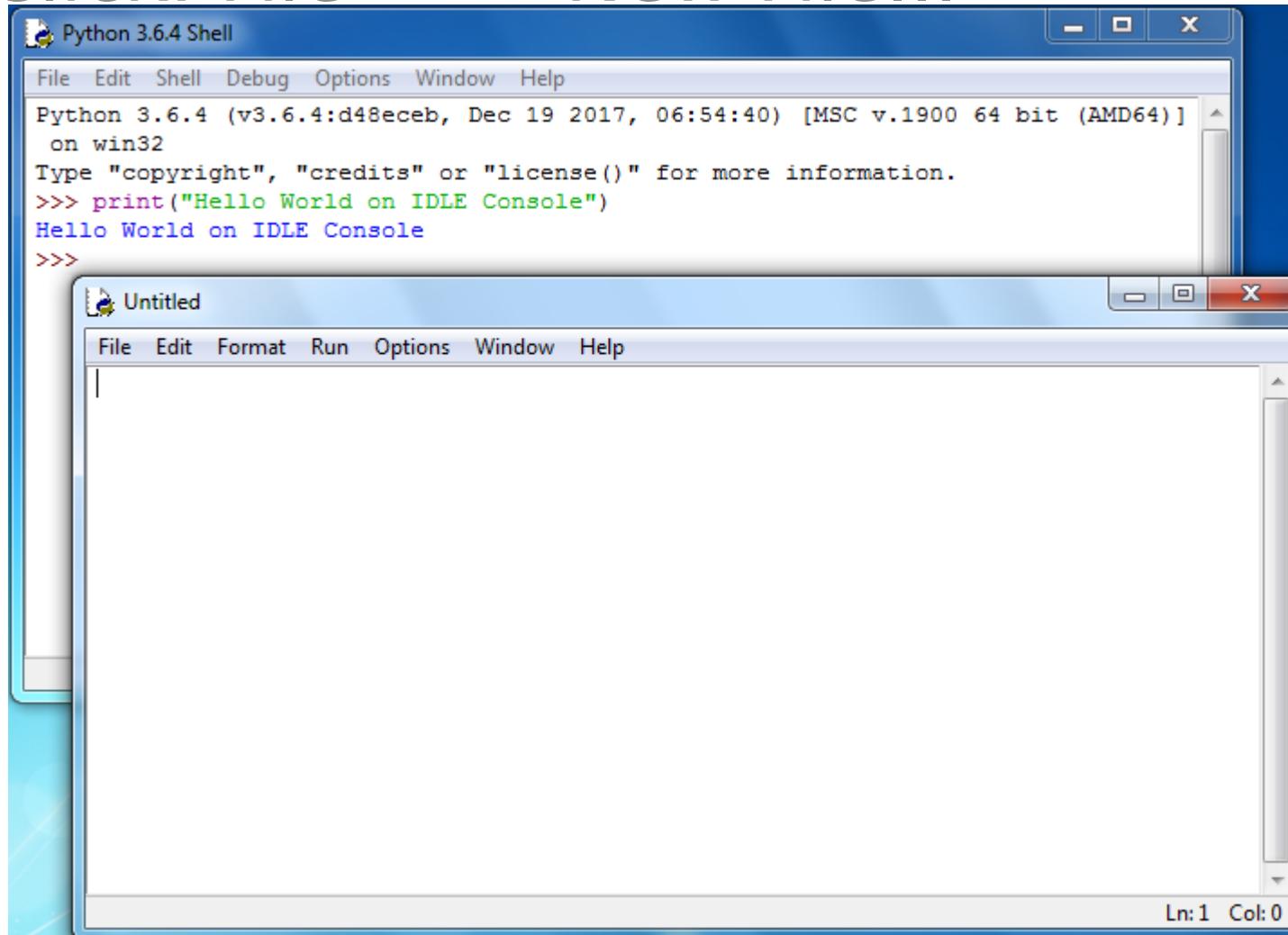
The screenshot shows the Python 3.6.4 Shell window. The title bar reads "Python 3.6.4 Shell". The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main window displays the following text:

```
Python 3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]
on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World on IDLE Console")
Hello World on IDLE Console
>>> |
```

In the bottom right corner, there is a status bar with "Ln: 5 Col: 4".

# Review of Python3

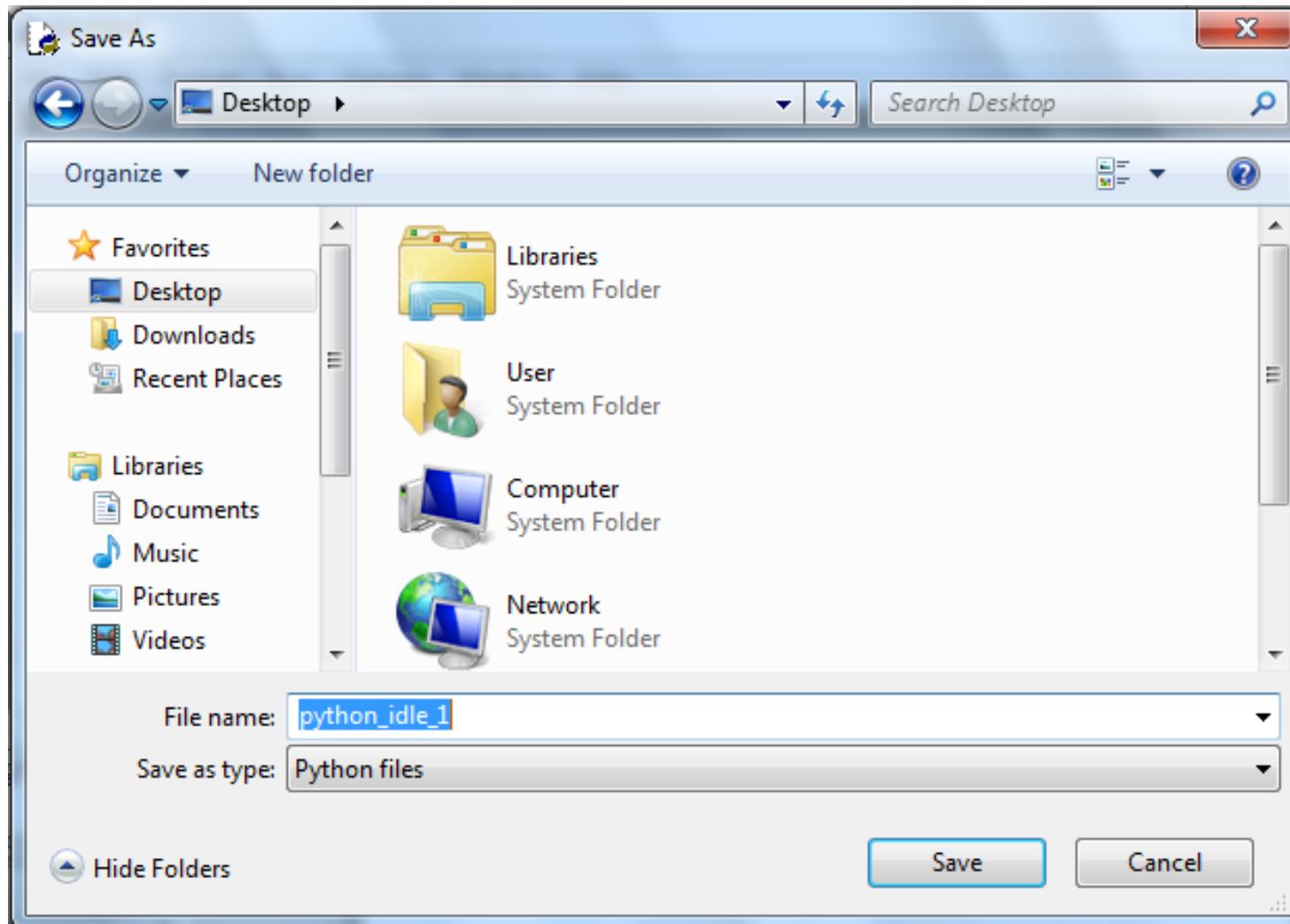
Click: File --> New File...



Creates a new window for writing python code.

# Review of Python3

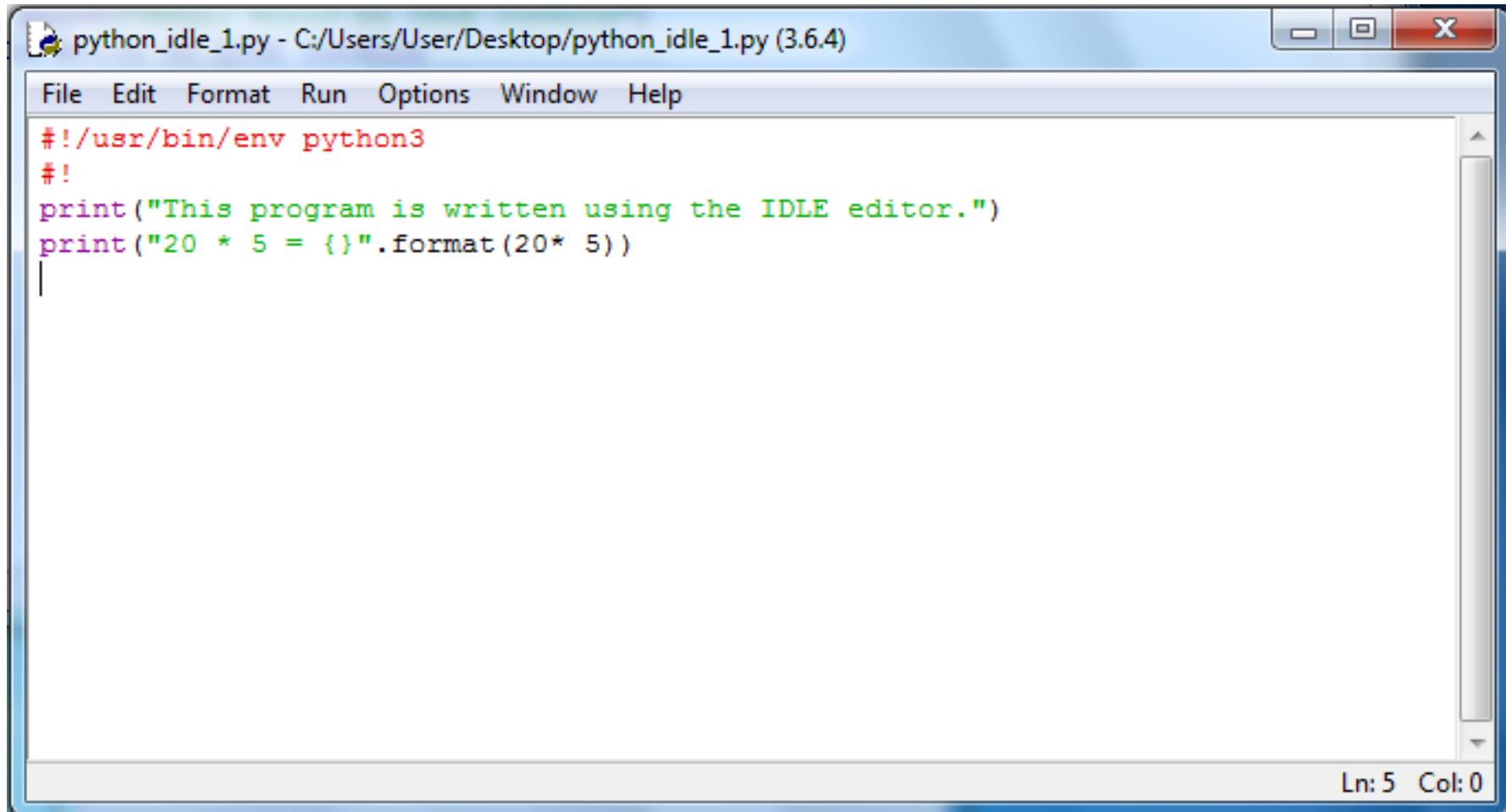
On new window click: File --> Save As...



Save new window. E.g. python\_idle\_1.py

# Review of Python3

Write python code in the new window.



The screenshot shows the Python IDLE editor window. The title bar reads "python\_idle\_1.py - C:/Users/User/Desktop/python\_idle\_1.py (3.6.4)". The menu bar includes File, Edit, Format, Run, Options, Window, and Help. The main code area contains the following Python script:

```
#!/usr/bin/env python3
#!
print("This program is written using the IDLE editor.")
print("20 * 5 = {}".format(20* 5))
```

The status bar at the bottom right indicates "Ln: 5 Col: 0".

Click: File --> Save

# Review of Python3

Click: Run --> Run Module. Output is in Shell

The image shows two windows from the Python 3.6.4 distribution. The top window is the 'Python 3.6.4 Shell' (idle.pyw.exe), which displays the output of running a script. The bottom window is the 'python\_idle\_1.py - C:/Users/User/Desktop/python\_idle\_1.py (3.6.4)' (idlewin.pyw.exe), which shows the source code of the script.

**Python 3.6.4 Shell (idle.pyw.exe) Content:**

```
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]
on win32
Type "copyright", "credits" or "license()" for more information.
>>> print("Hello World on IDLE Console")
Hello World on IDLE Console
>>>
=====
RESTART: C:/Users/User/Desktop/python_idle_1.py =====
This program is written using the IDLE editor.
20 * 5 = 100
>>>
```

**python\_idle\_1.py - C:/Users/User/Desktop/python\_idle\_1.py (3.6.4) Content:**

```
#!/usr/bin/env python3
#
print("This program is written using the IDLE editor.")
print("20 * 5 = {}".format(20* 5))
```

Ln: 5 Col: 0

# Review of Python3

Edit program and add:

input("Hit return key to end program")

The screenshot shows the Python 3.6.4 Shell window. The title bar reads "Python 3.6.4 Shell". The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main window displays the following text:

```
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]  
on win32  
Type "copyright", "credits" or "license()" for more information.  
>>> print("Hello World on IDLE Console")  
Hello World on IDLE Console  
>>>  
===== RESTART: C:/Users/User/Desktop/python_idle_1.py ======  
This program is written using the IDLE editor.  
20 * 5 = 100  
>>>  
===== RESTART: C:/Users/User/Desktop/python_idle_1.py ======  
This program is written using the IDLE editor.  
20 * 5 = 100  
Hit Return key to end program  
>>>
```

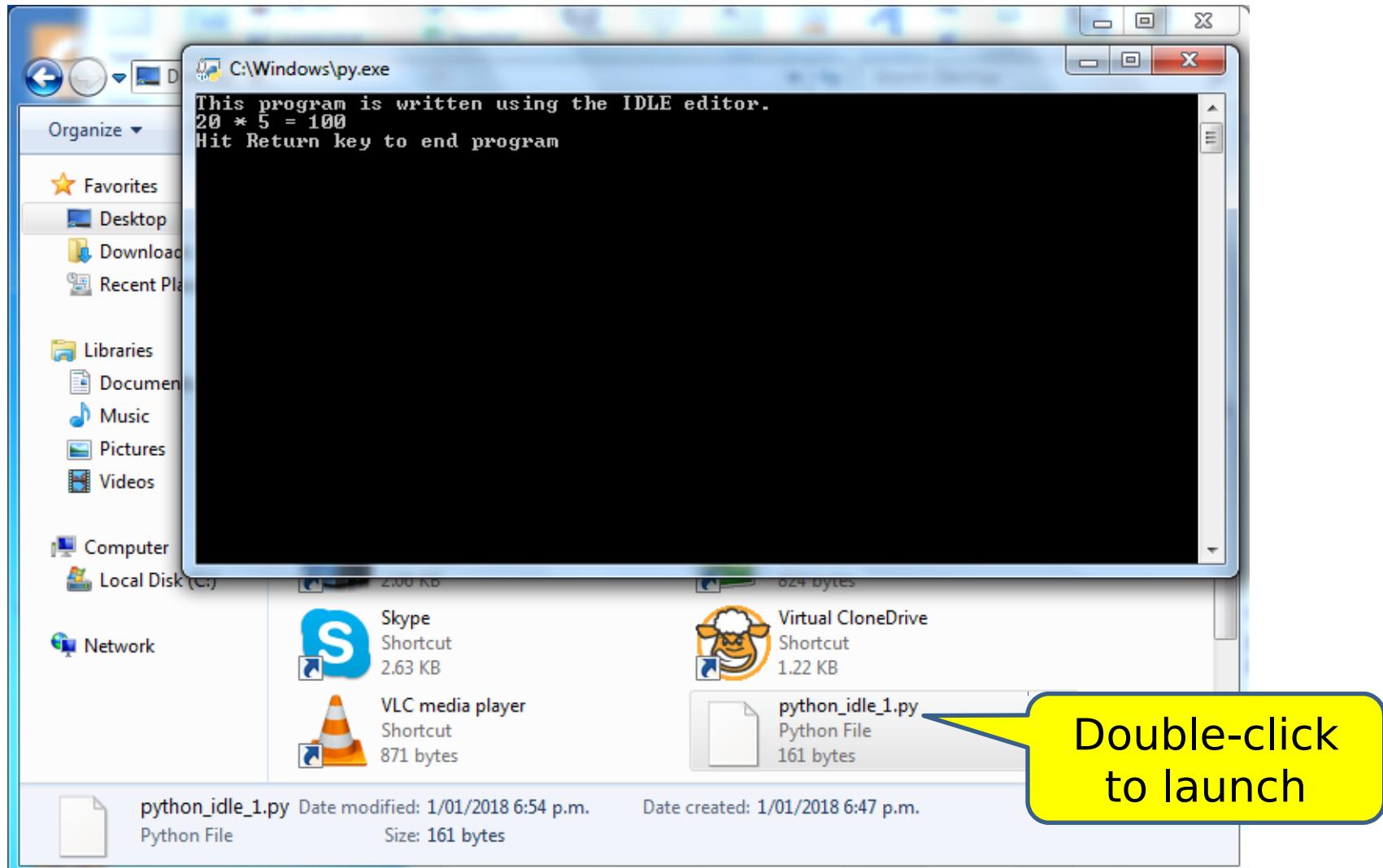
Below the shell window is a file browser window titled "python\_idle\_1.py - C:/Users/User/Desktop/python\_idle\_1.py (3.6.4)". The menu bar for the browser window includes File, Edit, Format, Run, Options, Window, and Help. The code in the browser window is:

```
#!/usr/bin/env python3  
#!  
print("This program is written using the IDLE editor.")  
print("20 * 5 = {}".format(20* 5))  
input("Hit Return key to end program")
```

# Review of Python3

Use File manager and double-click on file...

Python console window opens. Waits for Return key



# Review of Python3

Click: Start --> Python3.6 Manuals

The screenshot shows a Windows-style application window titled "Python 3.6.4 documentation". The window has a toolbar with icons for Hide, Locate, Back, Forward, Home, Font, Print, and Options. Below the toolbar is a menu bar with "Contents", "Index", "Search", and "Favorites". The main content area displays the "Python » 3.6.4 Documentation »" page. At the top right of this page are links for "next", "modules", and "index". The left side of the window features a navigation tree titled "3.6.4 Documentation" which lists various sections such as "What's New in Python", "The Python Tutorial", "Python Setup and Usage", etc. The title "Python Documentation contents" is displayed prominently in the center of the main content area. Below it, a bulleted list details the new features in Python 3.6, including PEP 498, PEP 526, PEP 515, PEP 525, PEP 530, PEP 487, PEP 519, PEP 495, PEP 529, and changes to Windows filesystem encoding.

## Python Documentation contents

- [What's New in Python](#)
  - [What's New In Python 3.6](#)
    - [Summary – Release highlights](#)
    - [New Features](#)
      - [PEP 498: Formatted string literals](#)
      - [PEP 526: Syntax for variable annotations](#)
      - [PEP 515: Underscores in Numeric Literals](#)
      - [PEP 525: Asynchronous Generators](#)
      - [PEP 530: Asynchronous Comprehensions](#)
      - [PEP 487: Simpler customization of class creation](#)
      - [PEP 487: Descriptor Protocol Enhancements](#)
      - [PEP 519: Adding a file system path protocol](#)
      - [PEP 495: Local Time Disambiguation](#)
      - [PEP 529: Change Windows filesystem encoding to UTF-8](#)

# Review of Python3

Click: Start --> Python3.6 Module Docs

The screenshot shows a Microsoft Internet Explorer browser window displaying the Python 3.6.4 module documentation. The title bar indicates the URL is `http://localhost:55785/`. The page header includes the Python version (`Python 3.6.4 [v3.6.4:d48eceb, MSC v.1900 64 bit (AMD64)]`), the operating system (`Windows-7`), and links for `Module Index`, `Topics`, and `Keywords`. The main content area is titled `Index of Modules` and lists the names of all built-in modules. The modules are arranged in four columns:

ast	imp	sre	errno
bisect	io	stat	faulthandler
blake2	json	string	gc
codecs	locale	struct	itertools
codecs_cn	lsprof	symtable	marshal
codecs_hk	md5	thread	math
codecs_iso2022	multibytecodec	tracemalloc	mmap
codecs_jp	opcode	warnings	msvcrt
codecs_kr	operator	weakref	nt
codecs_tw	pickle	winapi	parser
collections	random	array	sys
csv	sha1	atexit	time
datetime	sha256	audioop	winreg
findvs	sha3	binascii	xxsubtype
functools	sha512	builtins	zipimport
heapq	signal	cmath	zlib

At the bottom right of the browser window, there is a status bar showing `100%`.

# Installing Python3 (plus IDLE)

## Information on built-in modules and libraries

The screenshot shows a web browser window displaying the Pydoc index of Python modules. The address bar shows `http://localhost:55785/`. The title bar indicates the page is "Pydoc: Index of Modules". The browser interface includes standard buttons for back, forward, search, and navigation.

The main content area displays a list of Python modules and packages, each with a blue hyperlink. The list is organized into four columns:

Column 1	Column 2	Column 3	Column 4
future	decimal	multiprocessing (package)	sre_constants
bootlocale	difflib	netrc	sre_parse
collections abc	dis	nntplib	ssl
compat pickle	distutils (package)	ntpath	stat
compression	doctest	nturl2path	statistics
dummy thread	dummy_threading	numbers	string
markupbase	email (package)	opcode	stringprep
osx support	encodings (package)	operator	struct
pydecimal	ensurepip (package)	optparse	subprocess
pyio	enum	os	sunau
sitebuiltins	filecmp	pathlib	symbol
strptime	fileinput	pdb	symtable
threading local	fnmatch	pickle	sysconfig
weakrefset	formatter	pickletools	tabnanny
abc	fractions	pipes	tarfile
aifc	ftplib	pkgutil	telnetlib
antigravity	functools	platform	tempfile
argparse	genericpath	plistlib	test (package)
ast	getopt	poplib	textwrap
asynchat	getpass	posixpath	this
asyncio (package)	gettext	pprint	threading
asynccore	glob	profile	timeit
base64	gzip	pstats	tkinter (package)
bdb	hashlib	pty	token
binhex	heapq	py_compile	tokenize
bisect	hmac	pyclbr	trace
bz2	html (package)	pydoc	traceback

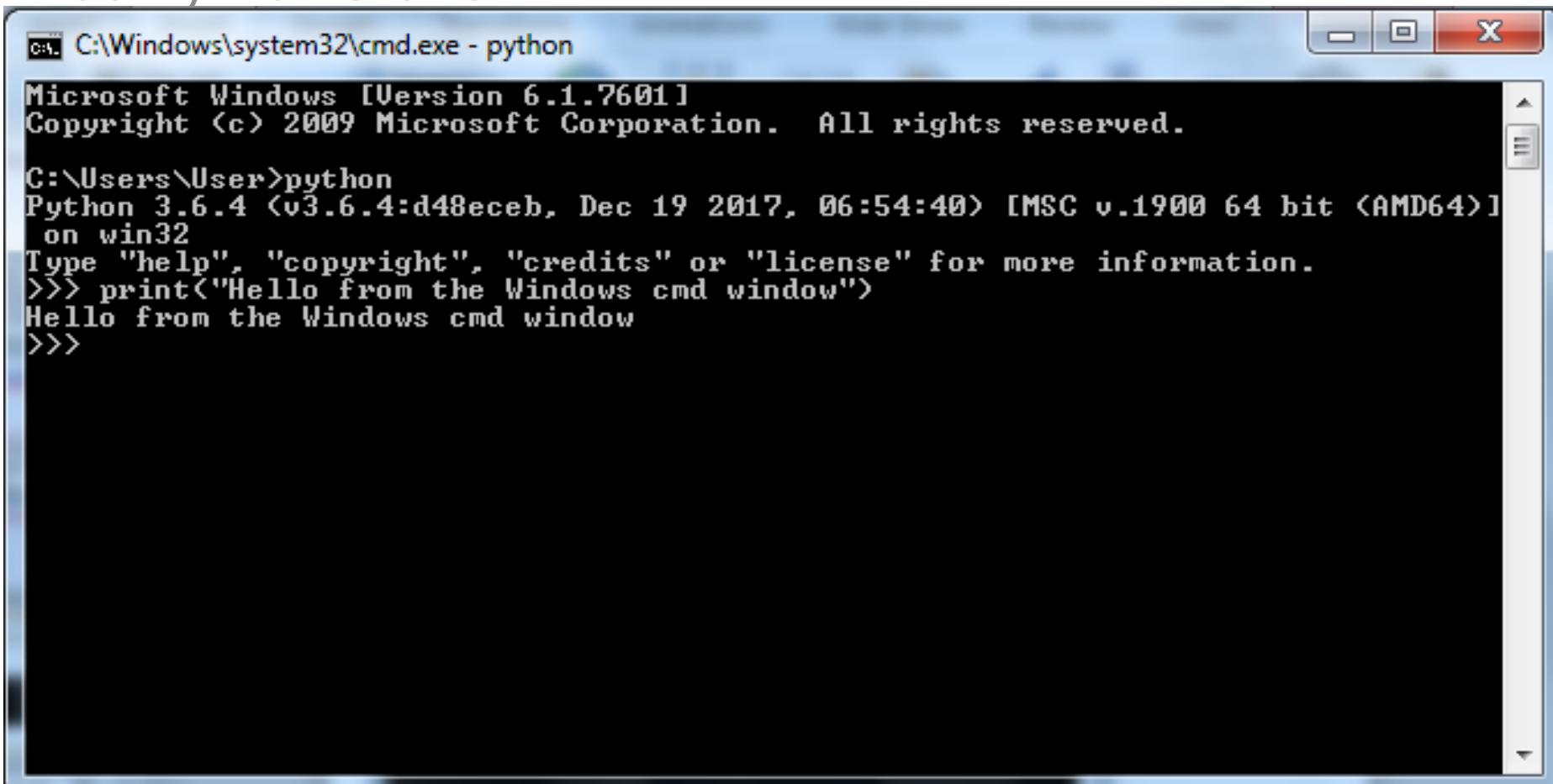
The status bar at the bottom right shows a zoom level of 100%.

# Review of Python3

Windows cmd window.

The path to python is known as during installation we checked:

“Add Python 3.6 to PATH”



A screenshot of a Windows Command Prompt window (cmd.exe) titled "C:\Windows\system32\cmd.exe - python". The window shows the following text output:

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

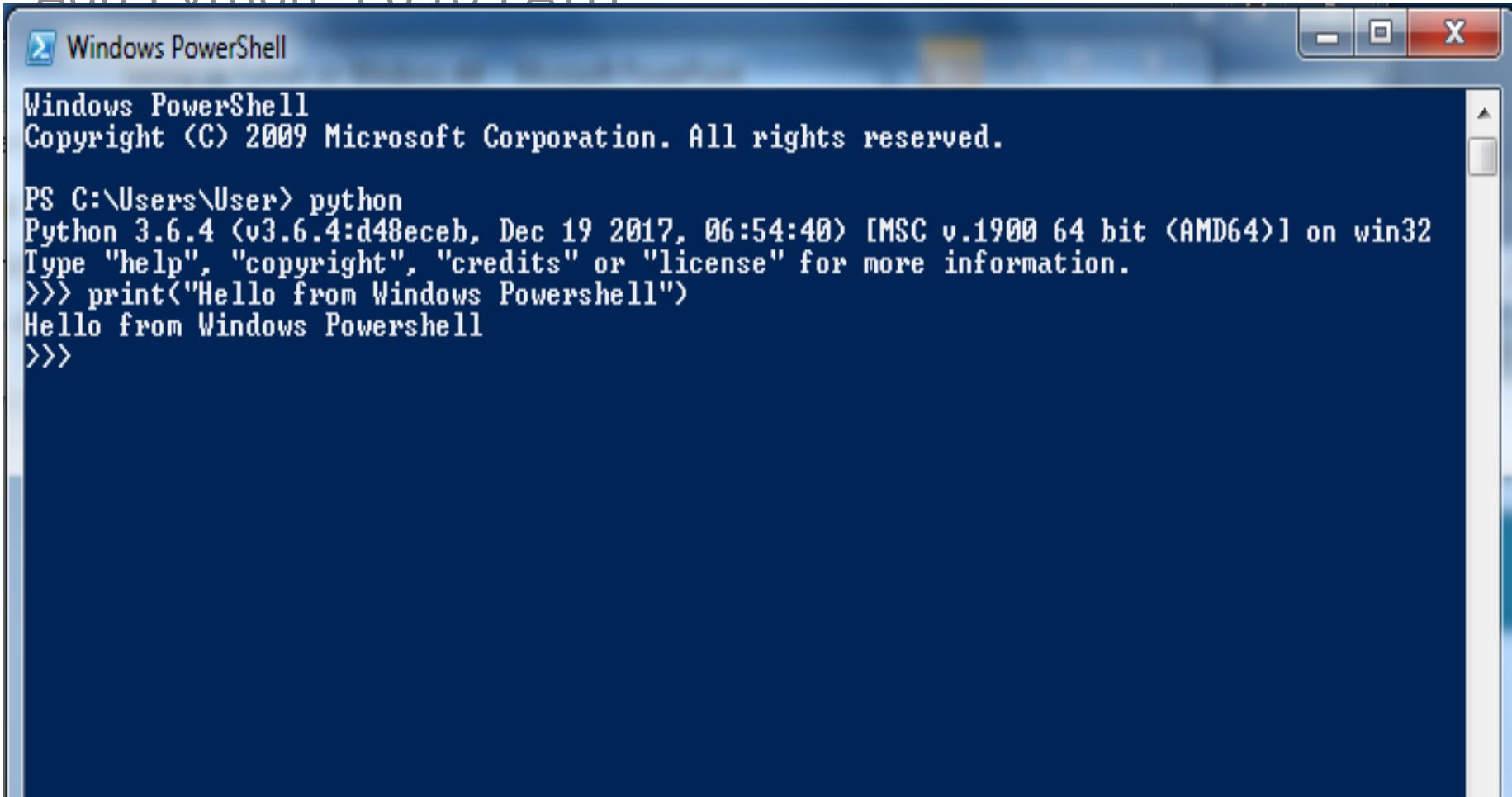
C:\Users\User>python
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]
on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello from the Windows cmd window")
Hello from the Windows cmd window
>>>
```

# Review of Python3

Windows Powershell window.

The path to python is known as during installation we checked:

“Add Python 3.6 to PATH”

A screenshot of a Windows PowerShell window titled "Windows PowerShell". The title bar includes standard window controls (minimize, maximize, close) and the title. The main area displays the following text:

```
Windows PowerShell
Copyright (C) 2009 Microsoft Corporation. All rights reserved.

PS C:\Users\User> python
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello from Windows Powershell")
Hello from Windows Powershell
>>>
```

The window has a blue header bar and a dark blue body. A vertical scroll bar is visible on the right side.

# Review of Python3

FYI: Location of Python related files...

```
C:\Windows\system32\cmd.exe
Volume Serial Number is 6073-8AF0

Directory of C:\Users\User\AppData\Local\Programs\Python\Python36

01/01/2018  08:37 p.m.    <DIR>      .
01/01/2018  08:37 p.m.    <DIR>      ..
01/01/2018  08:36 p.m.    <DIR>      DLLs
01/01/2018  08:36 p.m.    <DIR>      Doc
01/01/2018  08:36 p.m.    <DIR>      include
01/01/2018  08:36 p.m.    <DIR>      Lib
01/01/2018  08:36 p.m.    <DIR>      libs
19/12/2017  07:01 a.m.          30,334 LICENSE.txt
19/12/2017  07:01 a.m.          379,756 NEWS.txt
19/12/2017  06:58 a.m.          100,504 python.exe
19/12/2017  06:55 a.m.          58,520 python3.dll
19/12/2017  06:55 a.m.          3,610,776 python36.dll
19/12/2017  06:58 a.m.          98,968 pythonw.exe
01/01/2018  08:37 p.m.    <DIR>      Scripts
01/01/2018  08:36 p.m.    <DIR>      tcl
01/01/2018  08:36 p.m.    <DIR>      Tools
09/06/2016  10:53 p.m.          87,888 vcruntime140.dll
                           7 File(s)   4,366,746 bytes
                           10 Dir(s)  99,020,455,936 bytes free

C:\Users\User\AppData\Local\Programs\Python\Python36>
```

# Review of Python3

FYI: cd Scripts for the location of pip3

For copying files from the python package index. PyPI.

```
C:\Users\User\AppData\Local\Programs\Python\Python36>cd Scripts
C:\Users\User\AppData\Local\Programs\Python\Python36\Scripts>dir
 Volume in drive C has no label.
 Volume Serial Number is 6073-8AF0

 Directory of C:\Users\User\AppData\Local\Programs\Python\Python36\Scripts

01/01/2018  08:37 p.m.    <DIR>          .
01/01/2018  08:37 p.m.    <DIR>          ..
01/01/2018  08:37 p.m.        98,194 easy_install-3.6.exe
01/01/2018  08:37 p.m.        98,194 easy_install.exe
01/01/2018  08:37 p.m.        98,166 pip.exe
01/01/2018  08:37 p.m.        98,166 pip3.6.exe
01/01/2018  08:37 p.m.        98,166 pip3.exe
               5 File(s)      490,886 bytes
               2 Dir(s)  99,020,431,360 bytes free
```

# Installing and Review of Python3

End of Python installation and setup

# Notepad Plus Plus (Notepad++)

A source code editor

# Notepad Plus Plus (Notepad++)

Notepad++ is a free, open-source, code editor.  
Home page: <https://notepad-plus-plus.org/>

Download:

<https://notepad-plus-plus.org/download/>

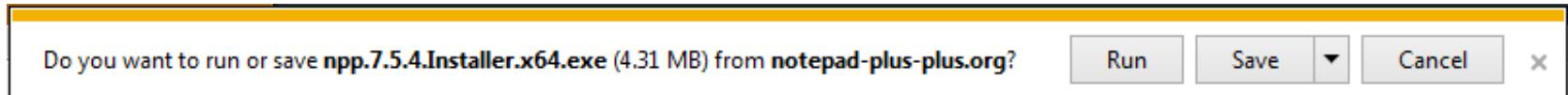
Scroll Down and click on Notepad++ Installer 64-bit

## Download 64-bit x64

Note that the most of plugins (including Plugin Manager) are not yet available in x64

- Notepad++ Installer 64-bit x64: Take this one if you have no idea which one you should take.

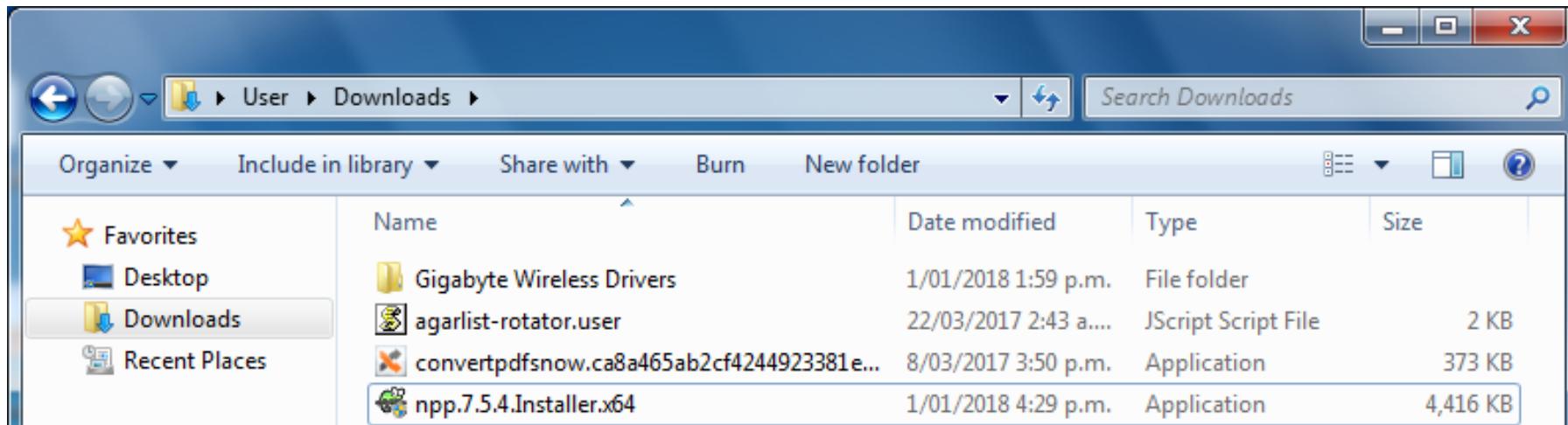
Click on Save to download



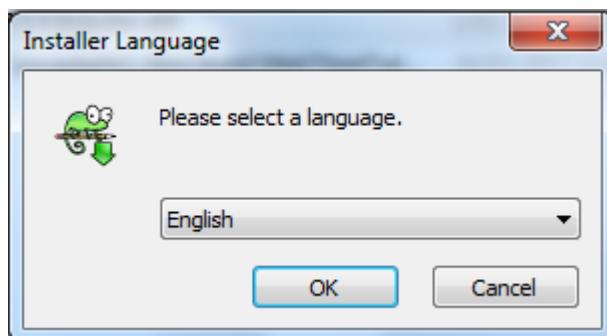
# Notepad Plus Plus (Notepad++)

Install Notepad++

Go to Downloads folder and double click on npp file...

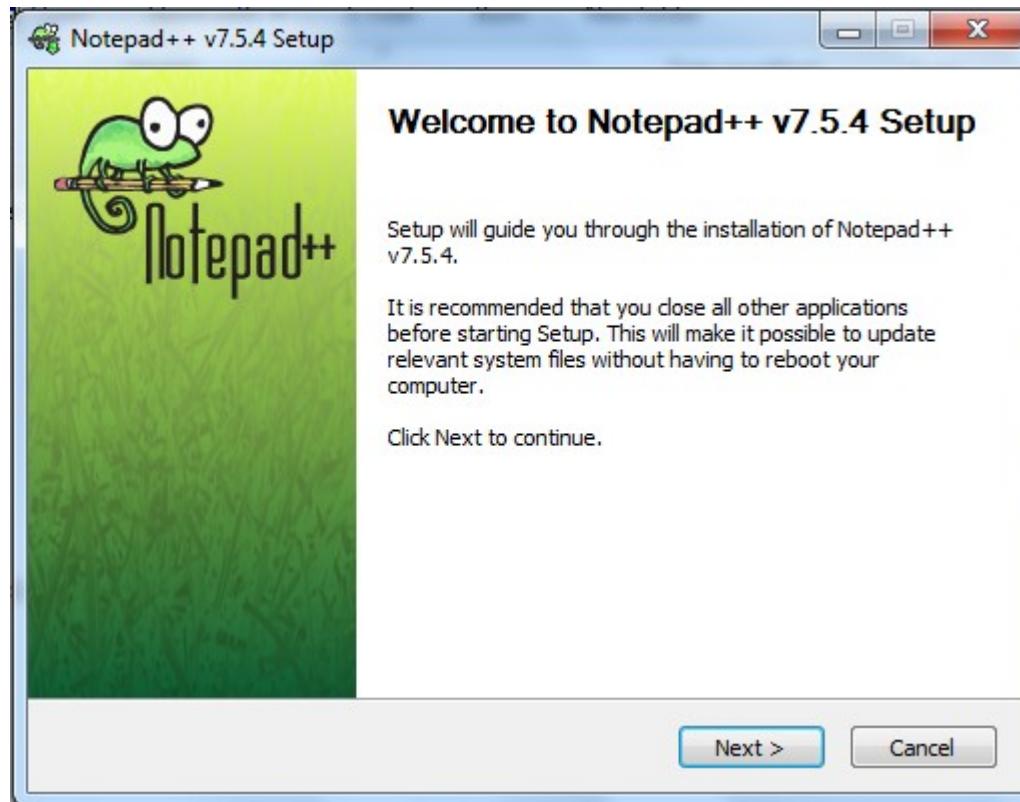


Click to approve install, and then select language...



# Notepad Plus Plus (Notepad++)

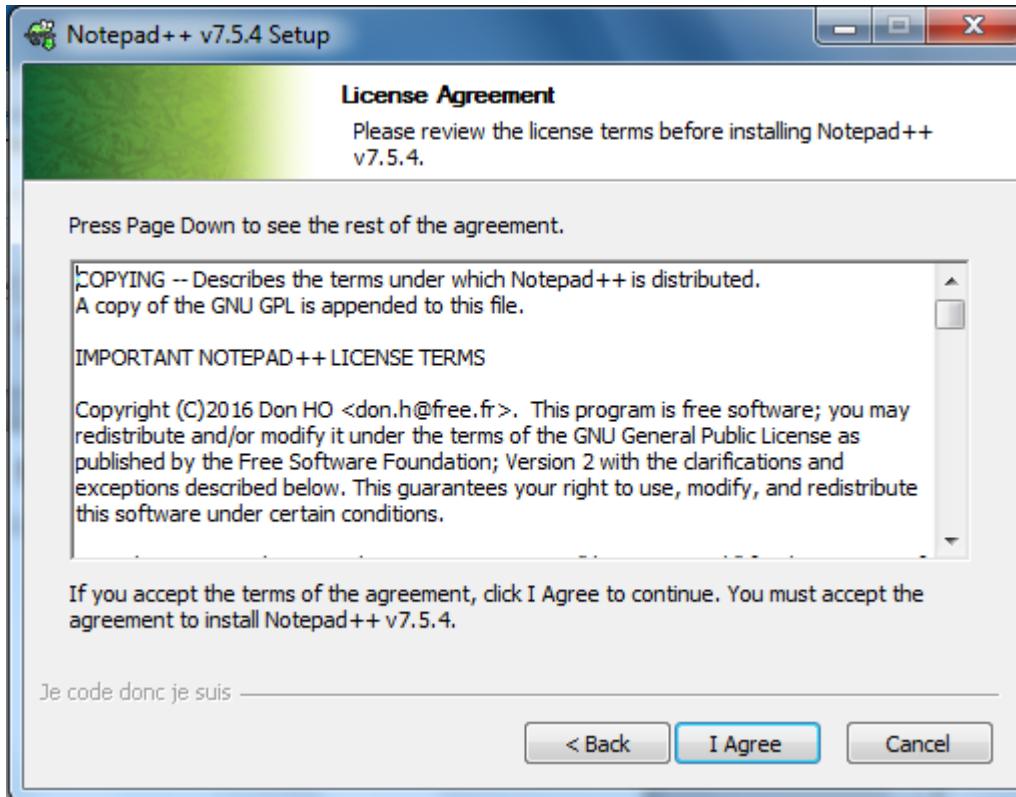
## Installation...



Click: Next >...

# Notepad Plus Plus (Notepad++)

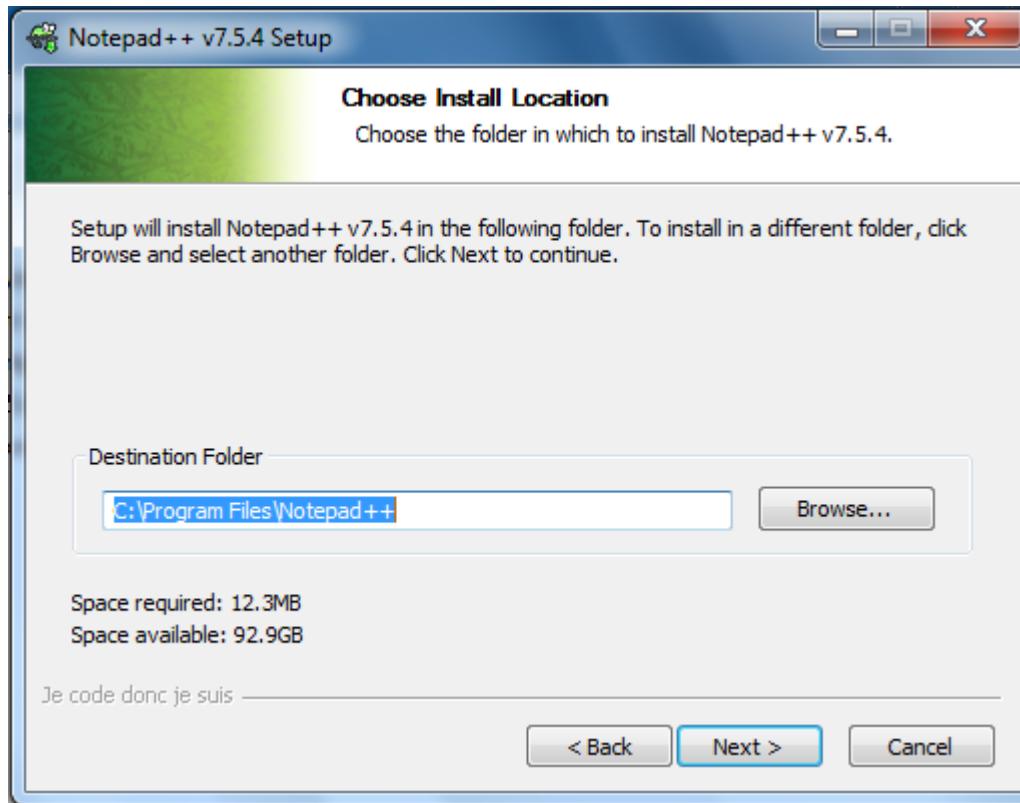
Installation. Accept Licence agreement...



Click: I Agree...

# Notepad Plus Plus (Notepad++)

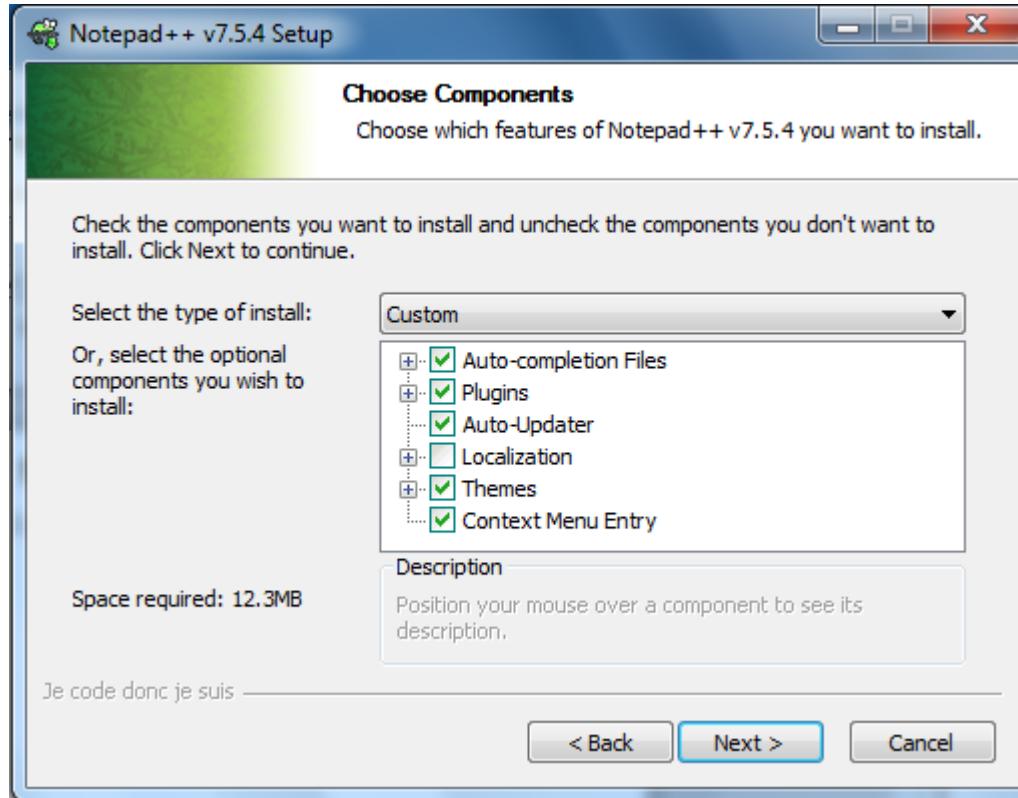
Installation. Choose Install Location...



Click: Next >...

# Notepad Plus Plus (Notepad++)

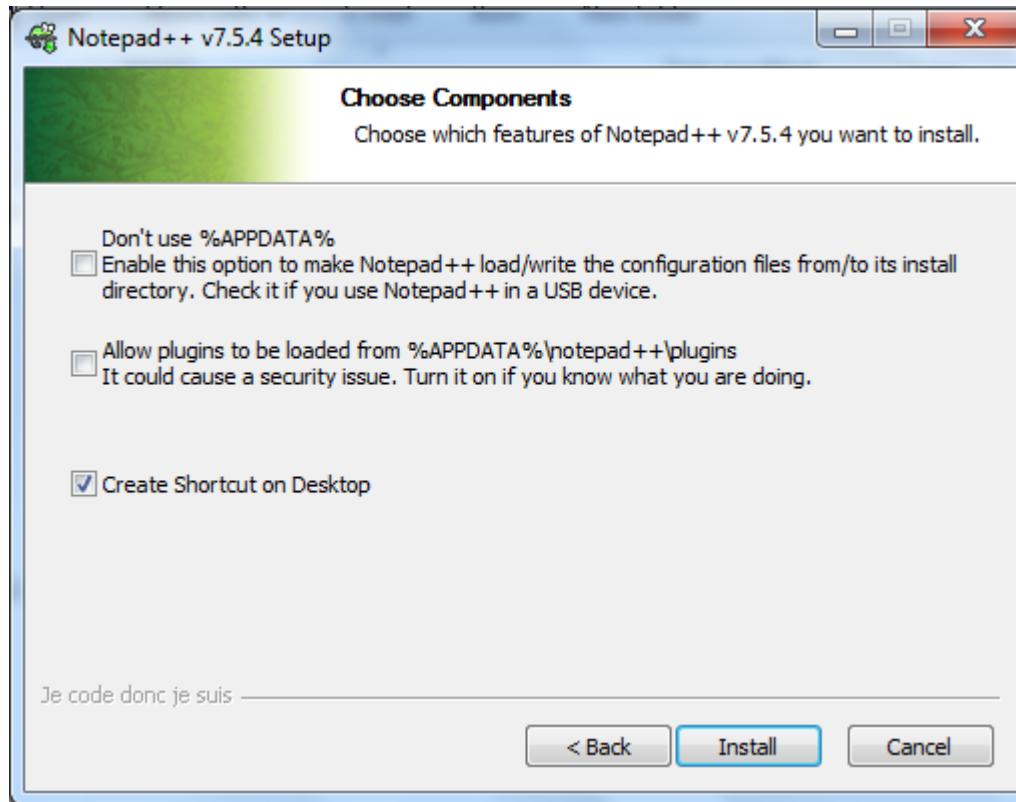
## Installation. Choose Components...



Click: Next >...

# Notepad Plus Plus (Notepad++)

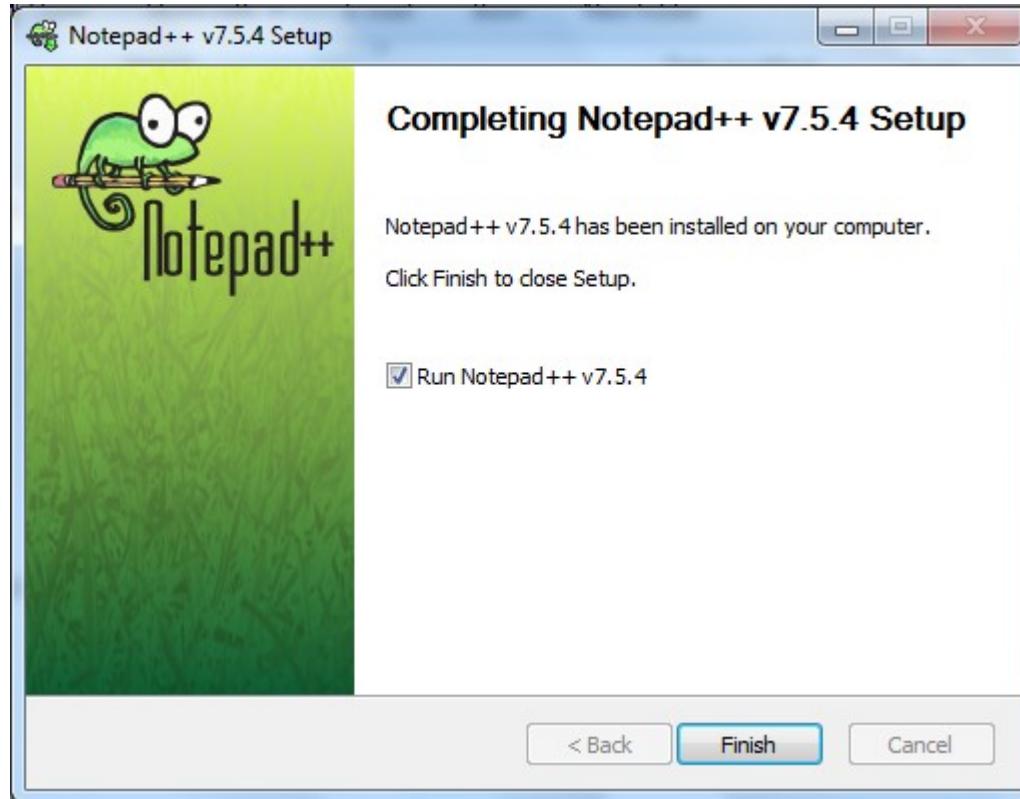
## Installation. Choose Components...



Click: Install...

# Notepad Plus Plus (Notepad++)

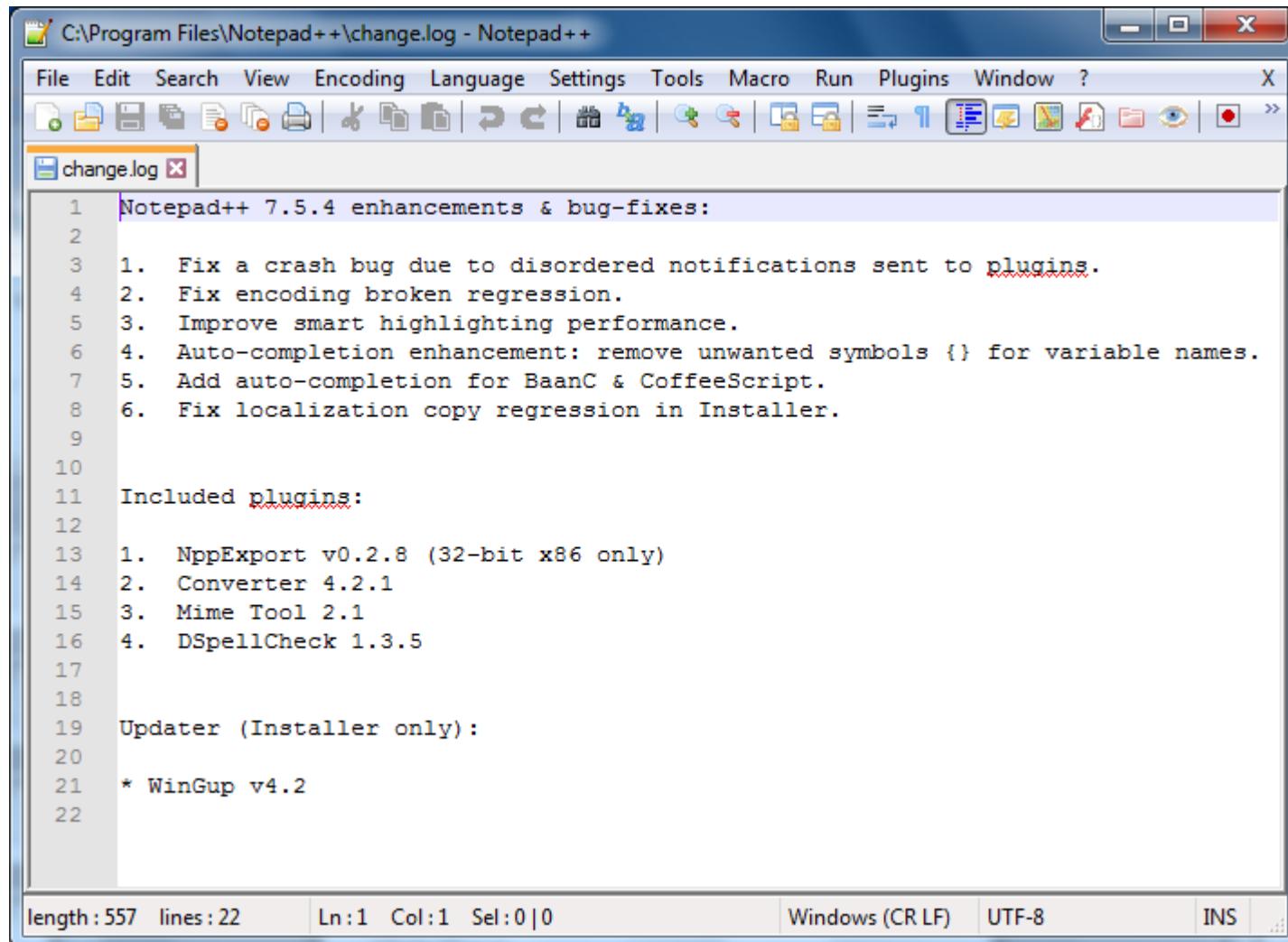
Installation. Choose Components...



Click: Finish...

# Notepad Plus Plus (Notepad++)

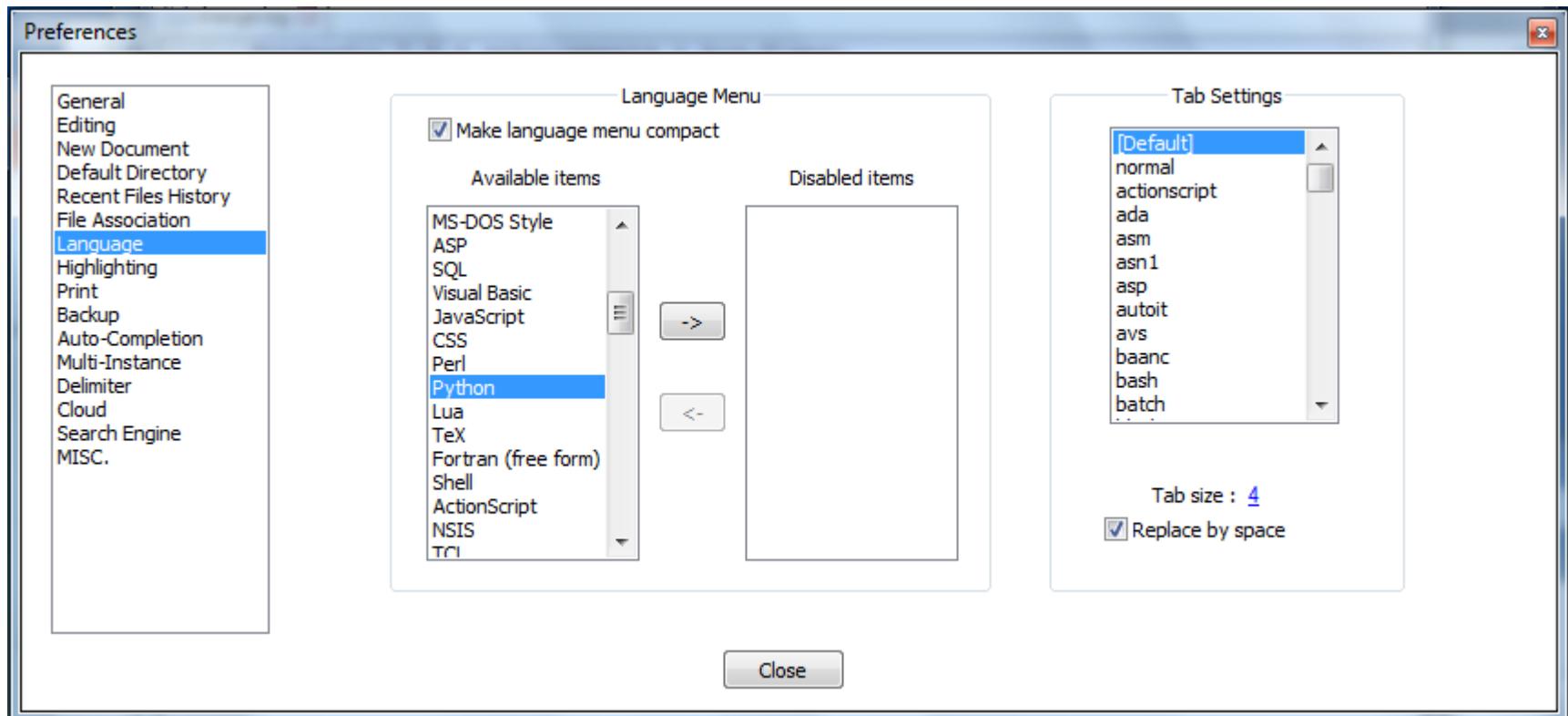
## Launched...



On Menu bar click on Settings --> Preferences...

# Notepad Plus Plus (Notepad++)

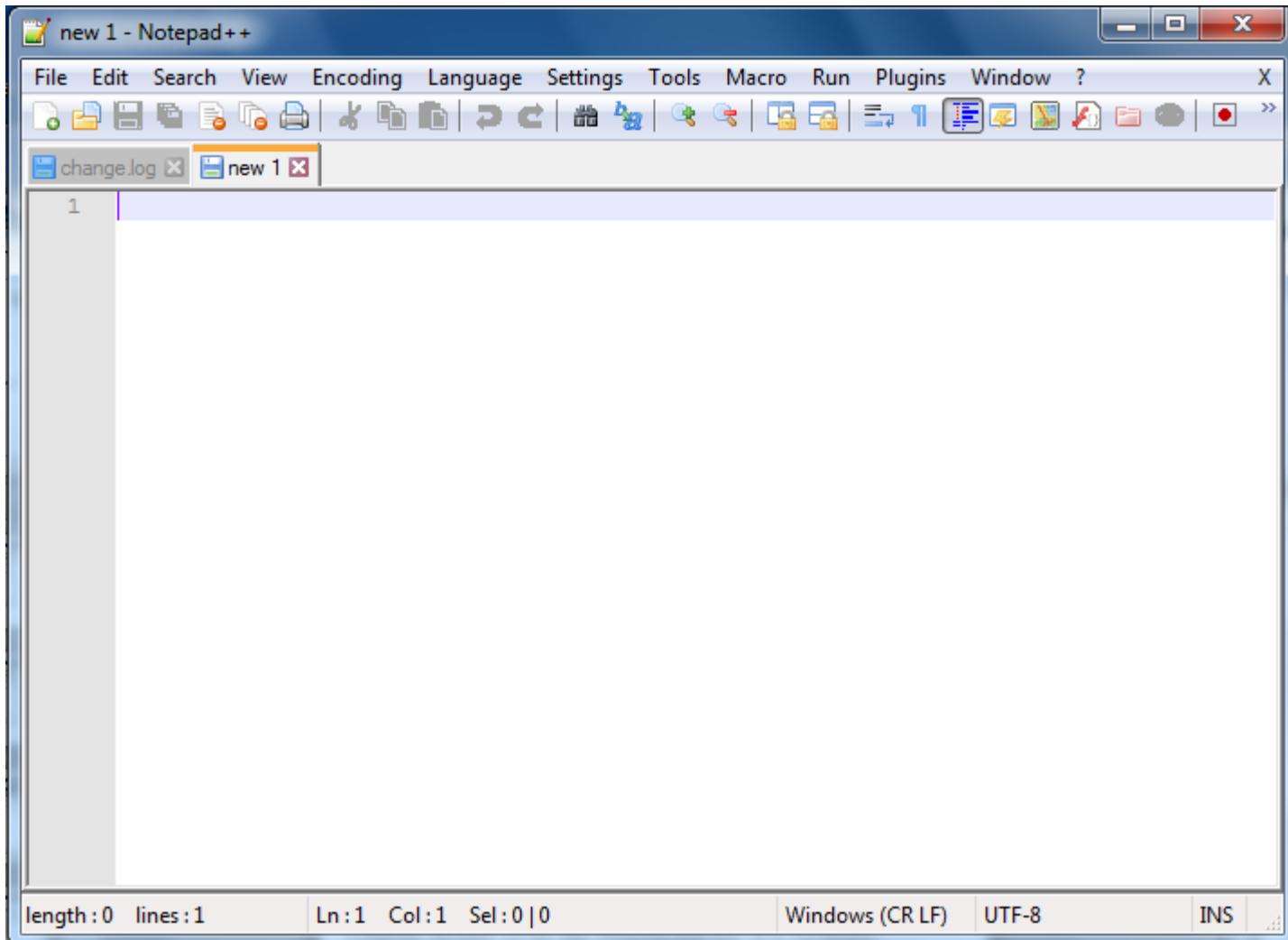
## Select Language...



Check: A tab is to be Replaced by 4 x spaces.  
Then click: Close

# Notepad Plus Plus (Notepad++)

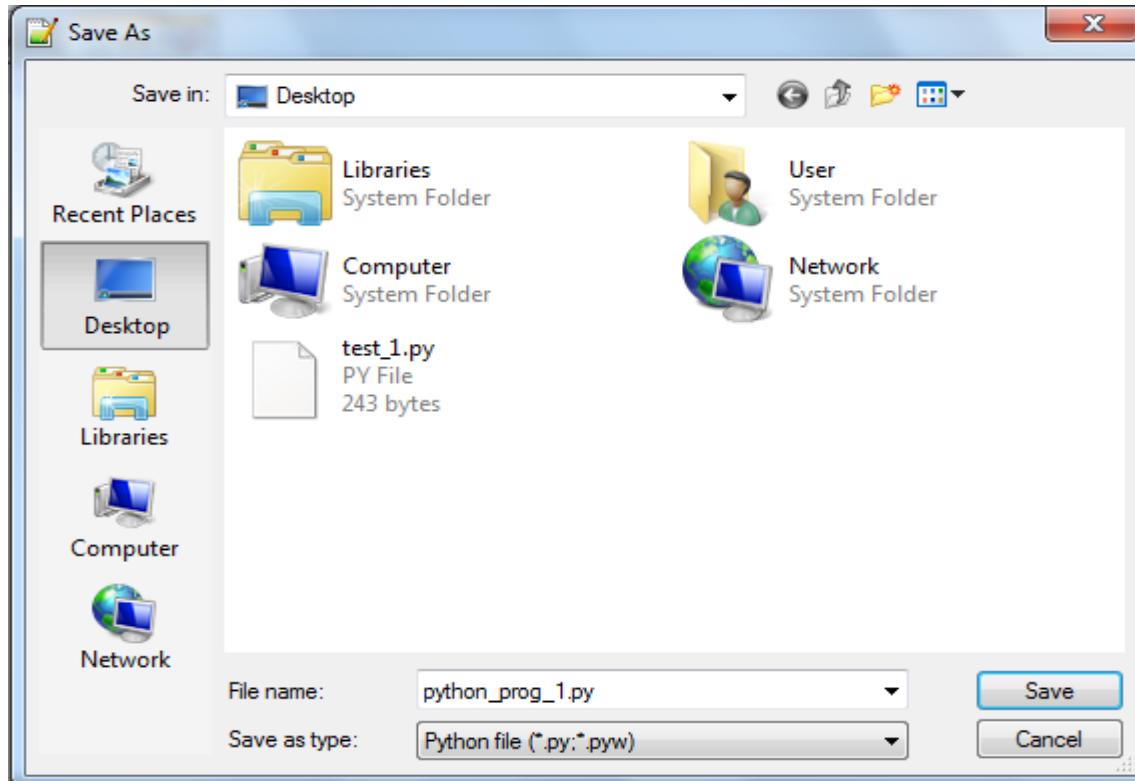
Create new editing session...



Click on the new file icon.

# Notepad Plus Plus (Notepad++)

Save new file: File --> Save As...



Click on Place: E.g. Desktop.

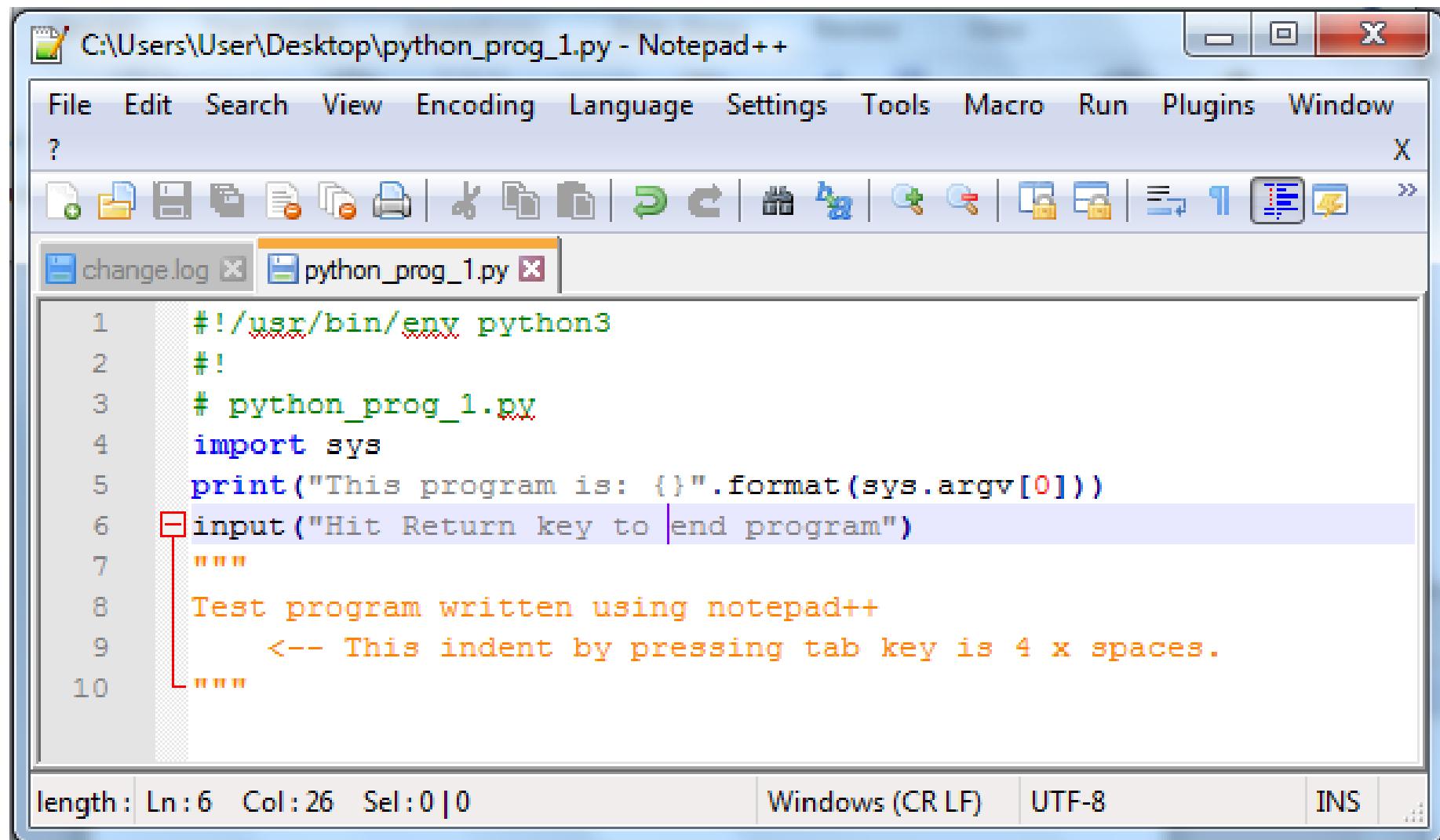
Provide python program file name. E.g. python\_prog\_1

Use drop down menu to select Python File (\*.py \*.pyw)

Click: Save

# Notepad Plus Plus (Notepad++)

Write a test program and save...



The screenshot shows the Notepad++ interface with a Python script open. The title bar reads "C:\Users\User\Desktop\python\_prog\_1.py - Notepad++". The menu bar includes File, Edit, Search, View, Encoding, Language, Settings, Tools, Macro, Run, Plugins, and Window. The toolbar contains various icons for file operations like Open, Save, Print, and Find. The status bar at the bottom shows "length: Ln:6 Col:26 Sel:0|0", "Windows (CR LF)", "UTF-8", and "INS". The code editor displays the following Python script:

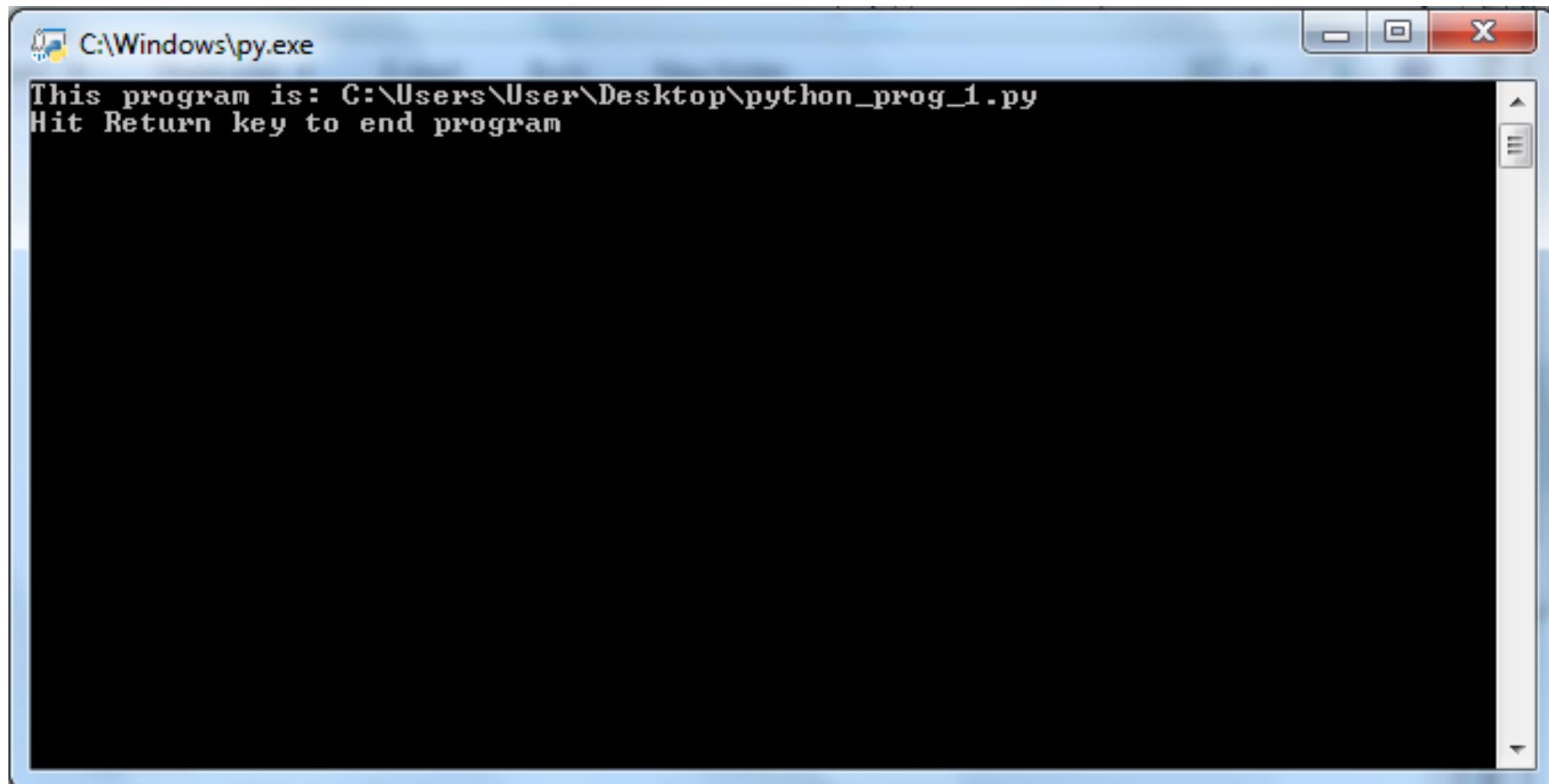
```
1  #!/usr/bin/env python3
2  #
3  # python_prog_1.py
4  import sys
5  print("This program is: {}".format(sys.argv[0]))
6  input("Hit Return key to end program")
7  """
8      Test program written using notepad++
9      <-- This indent by pressing tab key is 4 x spaces.
10     """

```

A red bracket on the left side of the code highlights the first two lines (shebang and blank line). A red box highlights the entire line "input("Hit Return key to end program")".

# Notepad Plus Plus (Notepad++)

Double click on file to run the program...



# Notepad Plus Plus (Notepad++)

End of Notepad installation and setup.

Additional editing preferences you may like:

Settings --> Preferences --> Auto-Completion

Check the boxes for: (, [, {, “ and ‘.

# Jupyter Notebook

A web-browser interface for writing python code.

# Jupyter Notebook

Formerly IPython Notebook.

Jupyter Notebook provides the web-based client, while IPython remains as the server engine.

Home page: <http://jupyter.org/>

Use cmd window to check pip is at latest version:

> pip3 install --upgrade pip

```
C:\Users\User>pip3 install --upgrade pip
Requirement already up-to-date: pip in c:\users\user\appdata\local\programs\python\python36\lib\site-packages
```

# Jupyter Notebook

Install Jupyter (and IPython)

> pip3 install jupyter

```
C:\Users\User>pip3 install --upgrade pip
Requirement already up-to-date: pip in c:\users\user\appdata\local\programs\python\python36\lib\site-packages

C:\Users\User>pip3 install jupyter
Collecting jupyter
  Downloading jupyter-1.0.0-py2.py3-none-any.whl
Collecting notebook <from jupyter>
  Downloading notebook-5.2.2-py2.py3-none-any.whl (8.0MB)
    22% ! [██████████] | 1.8MB 328kB/s eta 0:00:20
```

# Jupyter Notebook

## Install Jupyter (and IPython) continues...

```
Collecting ipywidgets (from jupyter)
  Downloading ipywidgets-7.1.0-py2.py3-none-any.whl (68kB)
    100% |██████████| 71kB 306kB/s
Collecting qtconsole (from jupyter)
  Downloading qtconsole-4.3.1-py2.py3-none-any.whl (108kB)
    100% |██████████| 112kB 468kB/s
Collecting nbconvert (from jupyter)
  Downloading nbconvert-5.3.1-py2.py3-none-any.whl (387kB)
    100% |██████████| 389kB 437kB/s
Collecting jupyter-core (from notebook->jupyter)
  Downloading jupyter_core-4.4.0-py2.py3-none-any.whl (126kB)
    100% |██████████| 133kB 328kB/s
Collecting nbformat (from notebook->jupyter)
  Downloading nbformat-4.4.0-py2.py3-none-any.whl (155kB)
    100% |██████████| 163kB 298kB/s
Collecting tornado>=4 (from notebook->jupyter)
  Downloading tornado-4.5.2-cp36-cp36m-win_amd64.whl (422kB)
    100% |██████████| 430kB 285kB/s
Collecting jinja2 (from notebook->jupyter)
  Downloading Jinja2-2.10-py2.py3-none-any.whl (126kB)
    100% |██████████| 133kB 273kB/s
Collecting traitlets>=4.2.1 (from notebook->jupyter)
  Downloading traitlets-4.3.2-py2.py3-none-any.whl (74kB)
    100% |██████████| 81kB 308kB/s
```

# Jupyter Notebook

## Install Jupyter (and IPython) completes...

```
Collecting webencodings (from html5lib!=1.0b1,!=1.0b2,!=1.0b3,!=1.0b4,!=1.0b5,!=1.0b6,!=1.0b7,!=1.0b8,>=0.999999999pre->bleach->nbconvert->jupyter)
  Downloading webencodings-0.5.1-py2.py3-none-any.whl
Installing collected packages: six, decorator, ipython-genutils, traitlets, jupyter-core, jsonschema, nbformat, simplegeneric, pygments, parso, jedi, wcwidth, prompt-toolkit, colorama, pickleshare, ipython, tornado, attrs, py, pluggy, pytest, pyzmq, python-dateutil, jupyter-client, ipykernel, MarkupSafe, jinja2, testpath, webencodings, html5lib, bleach, pandocfilters, mistune, entrypoints, nbconvert, notebook, jupyter-console, widgetsnbextension, ipywidgets, qtconsole, jupyter
r
  Running setup.py install for simplegeneric ... done
  Running setup.py install for pluggy ... done
  Running setup.py install for MarkupSafe ... done
  Running setup.py install for pandocfilters ... done
Successfully installed MarkupSafe-1.0 attrs-17.4.0 bleach-2.1.2 colorama-0.3.9 d
ecorator-4.1.2 entrypoints-0.2.3 html5lib-1.0.1 ipykernel-4.7.0 ipython-6.2.1 ip
ython-genutils-0.2.0 ipywidgets-7.1.0 jedi-0.11.1 jinja2-2.10 jsonschema-2.6.0 j
upyter-1.0.0 jupyter-client-5.2.0 jupyter-console-5.2.0 jupyter-core-4.4.0 mistu
ne-0.8.3 nbconvert-5.3.1 nbformat-4.4.0 notebook-5.2.2 pandocfilters-1.4.2 parso
-0.1.1 pickleshare-0.7.4 pluggy-0.6.0 prompt-toolkit-1.0.15 py-1.5.2 pygments-2.
2.0 pytest-3.3.1 python-dateutil-2.6.1 pyzmq-16.0.3 qtconsole-4.3.1 simplegeneri
c-0.8.1 six-1.11.0 testpath-0.3.1 tornado-4.5.2 traitlets-4.3.2 wcwidth-0.1.7 we
bencodings-0.5.1 widgetsnbextension-3.1.0
```

C:\Users\User>

# Jupyter Notebook

Launching Jupyter Notebook from cmd window...

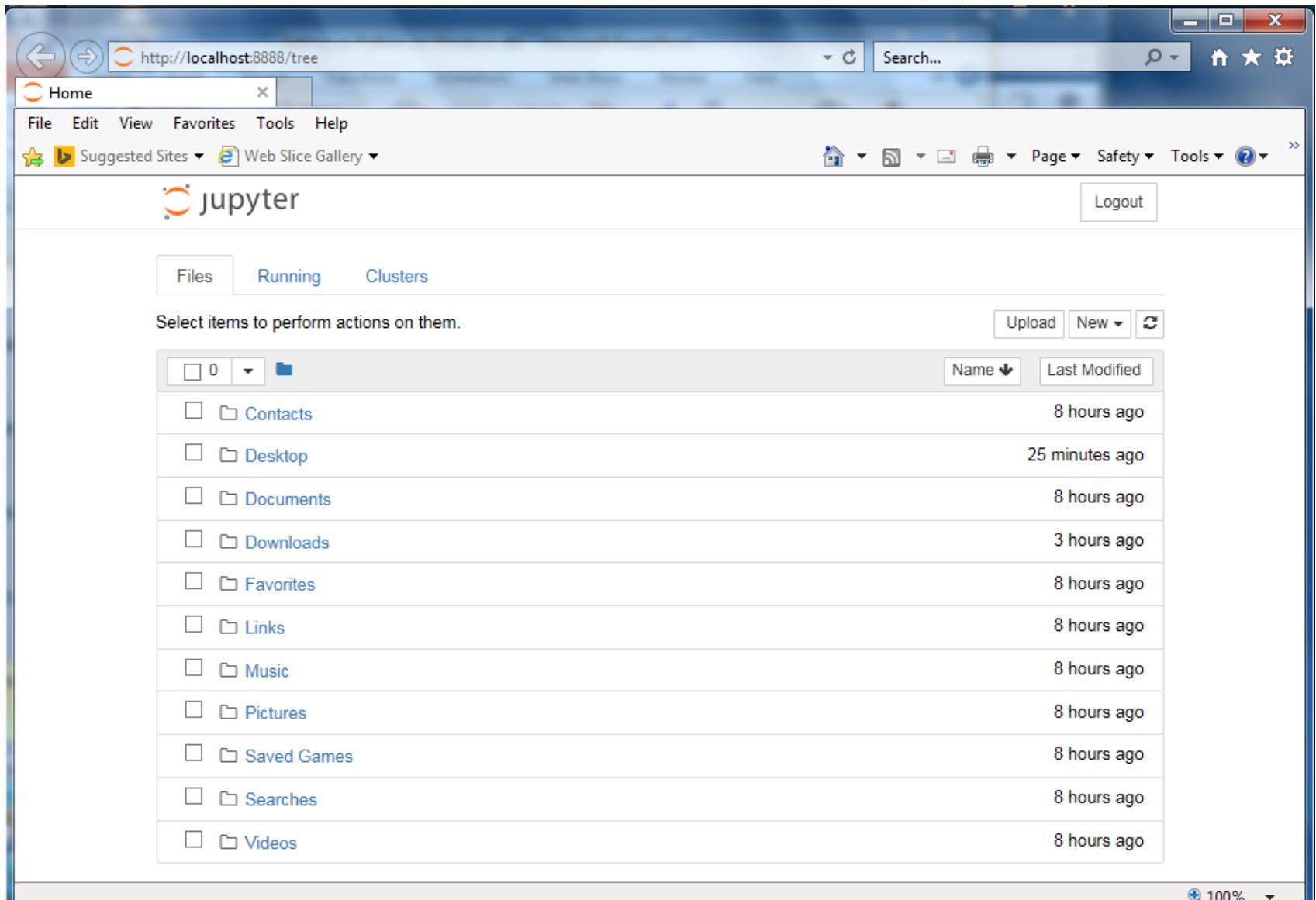
> jupyter notebook

```
C:\Windows\system32\cmd.exe - jupyter notebook
C:\Users\User>
C:\Users\User>
C:\Users\User>
C:\Users\User>jupyter notebook
[I 21:06:03.679 NotebookApp] Writing notebook server cookie secret to C:\Users\Us
er\AppData\Roaming\jupyter\runtime\notebook_cookie_secret
[I 21:06:04.959 NotebookApp] Serving notebooks from local directory: C:\Users\Us
er
[I 21:06:04.959 NotebookApp] 0 active kernels
[I 21:06:04.959 NotebookApp] The Jupyter Notebook is running at:
[I 21:06:04.959 NotebookApp] http://localhost:8888/?token=f308f56361520f78f07cc9
0c80a9fc3b5d58a8a27b277660
[I 21:06:04.959 NotebookApp] Use Control-C to stop this server and shut down all
kernels (twice to skip confirmation).
[C 21:06:04.974 NotebookApp]

Copy/paste this URL into your browser when you connect for the first time,
to login with a token:
    http://localhost:8888/?token=f308f56361520f78f07cc90c80a9fc3b5d58a8a27b2
77660
[I 21:06:05.489 NotebookApp] Accepting one-time-token-authenticated connection f
rom ::1
[W 21:06:06.253 NotebookApp] 404 GET /static/components/moment/locale/en-nz.js?
v=20180101210603 (::1) 15.60ms referer=http://localhost:8888/tree
```

# Jupyter Notebook

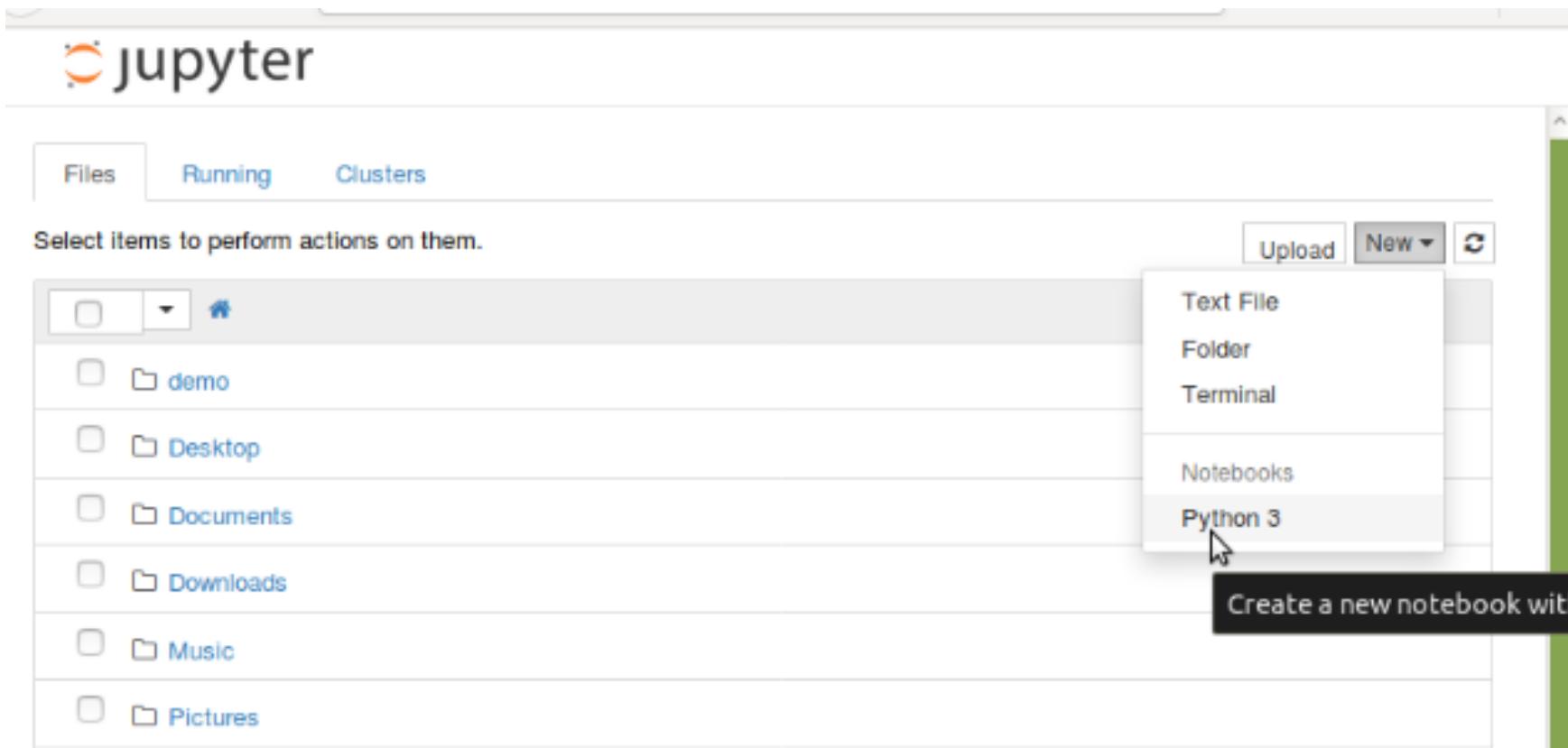
## Jupyter client displays in web-browser



# Jupyter Notebook

Click: New and Python3

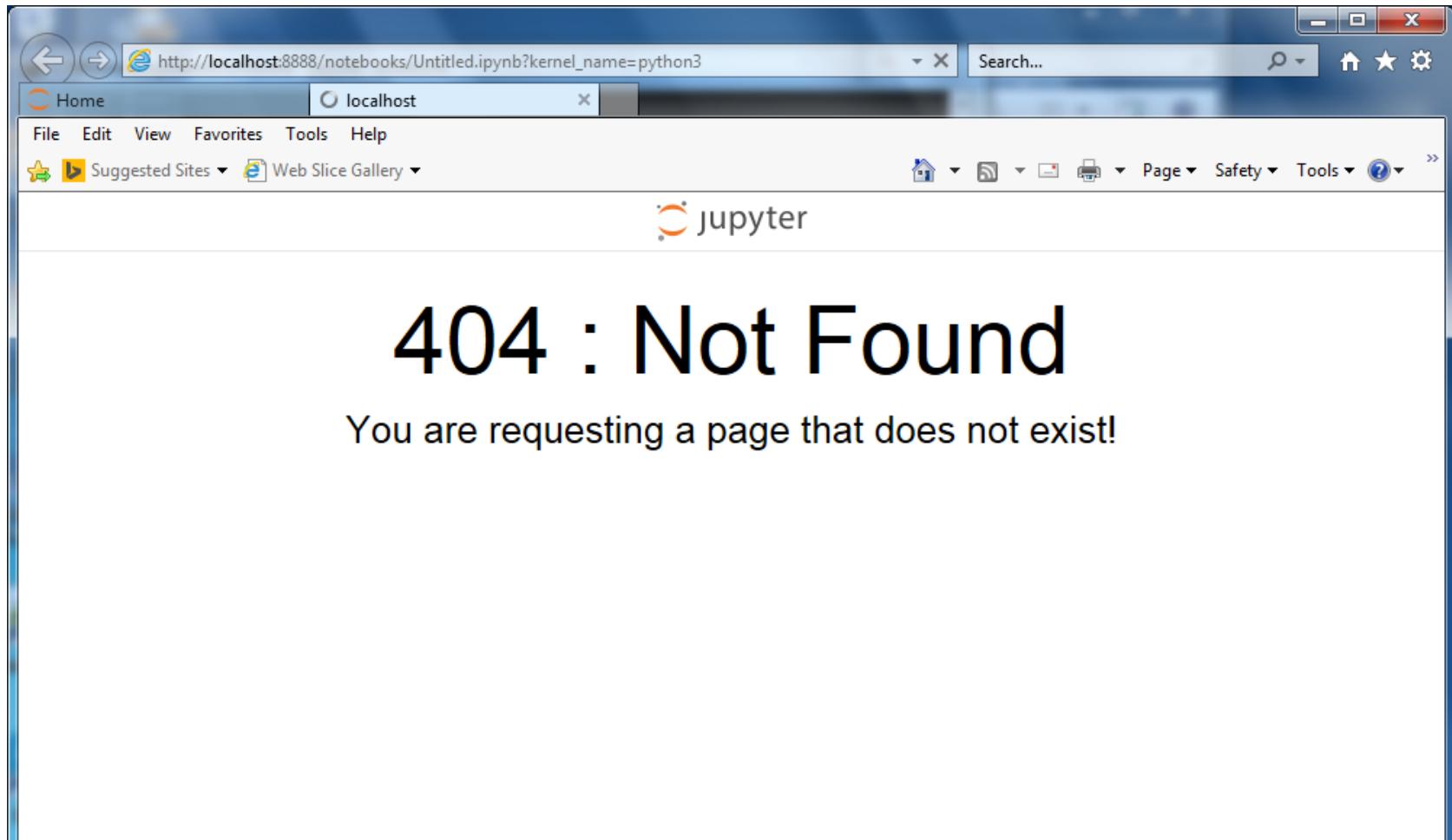
To create new jupyter notebook



# Jupyter Notebook

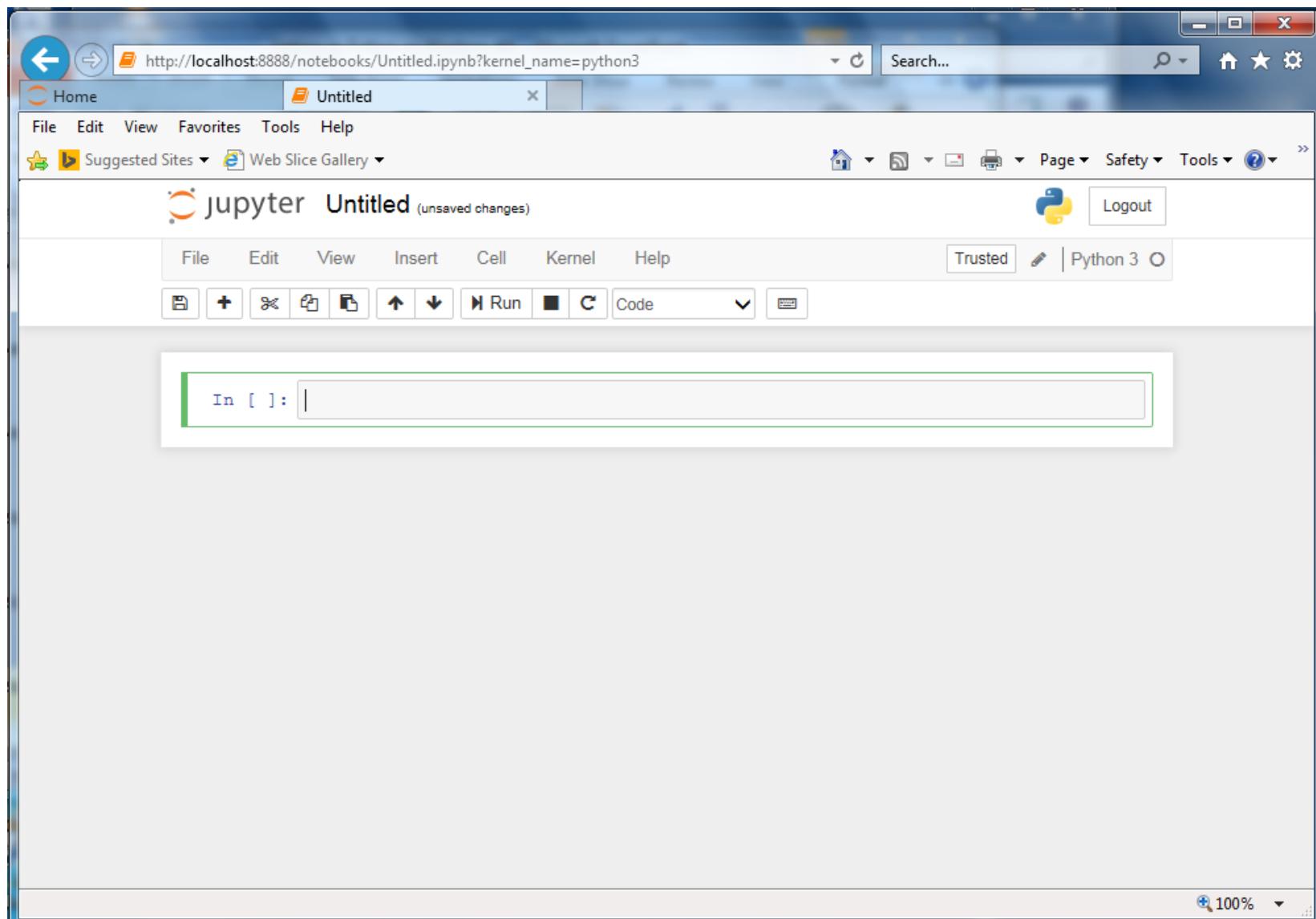
Glitch. Don't Panic!...

Click:Home tab then Click: localhost tab...



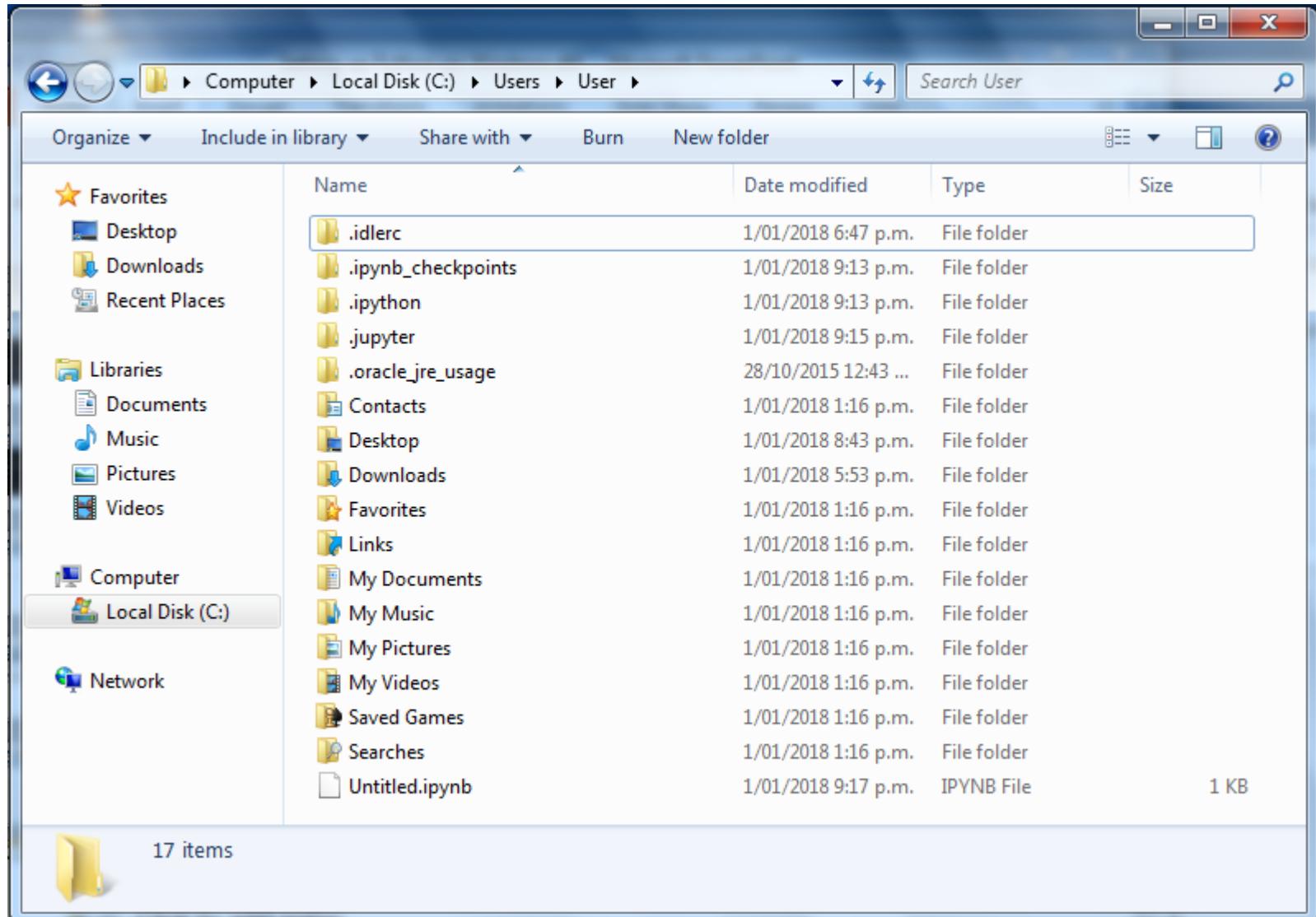
# Jupyter Notebook

Jupyter client for the file named Untitled.ipynb...



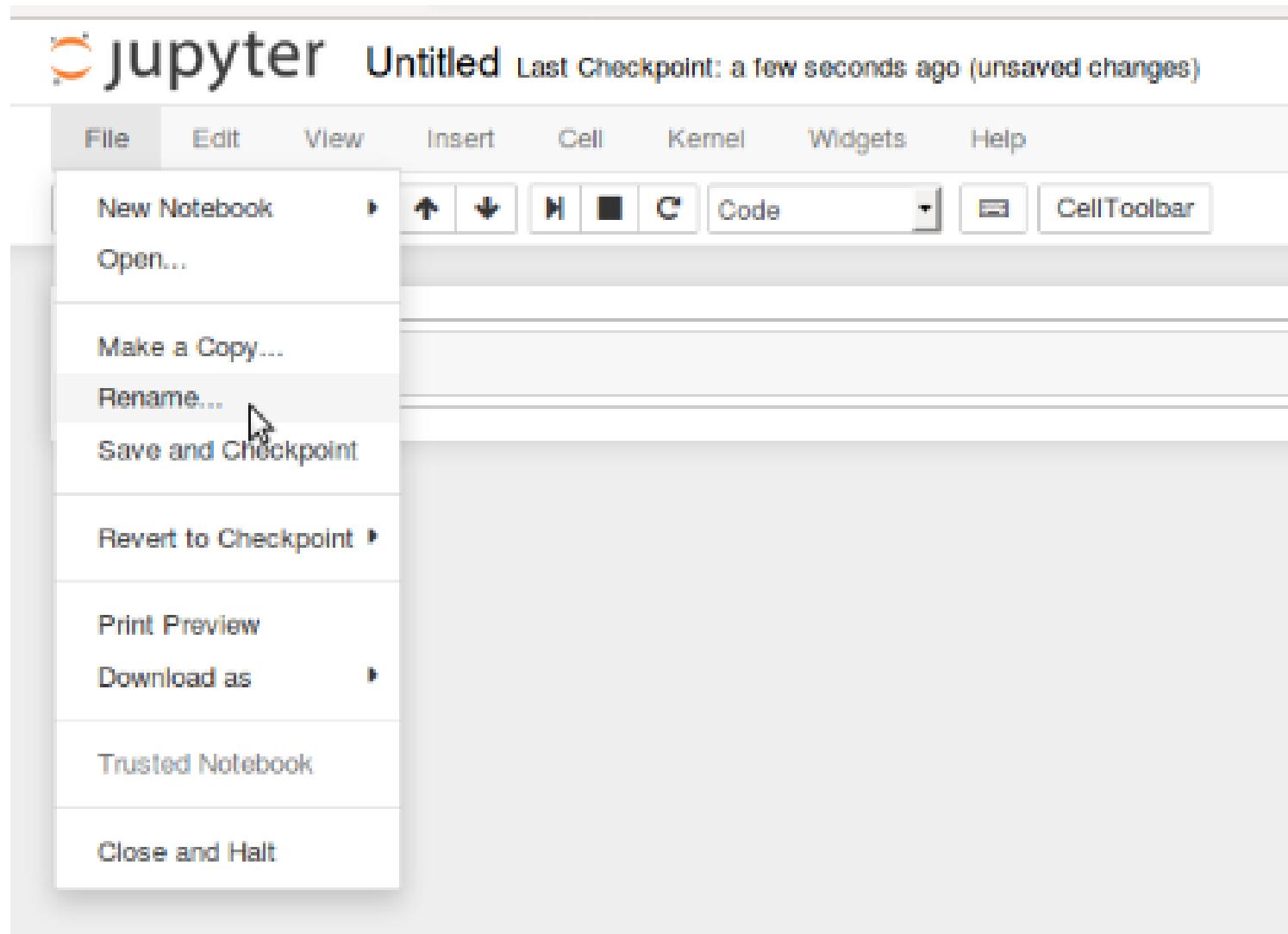
# Jupyter Notebook

## Untitled.ipynb file now exists...



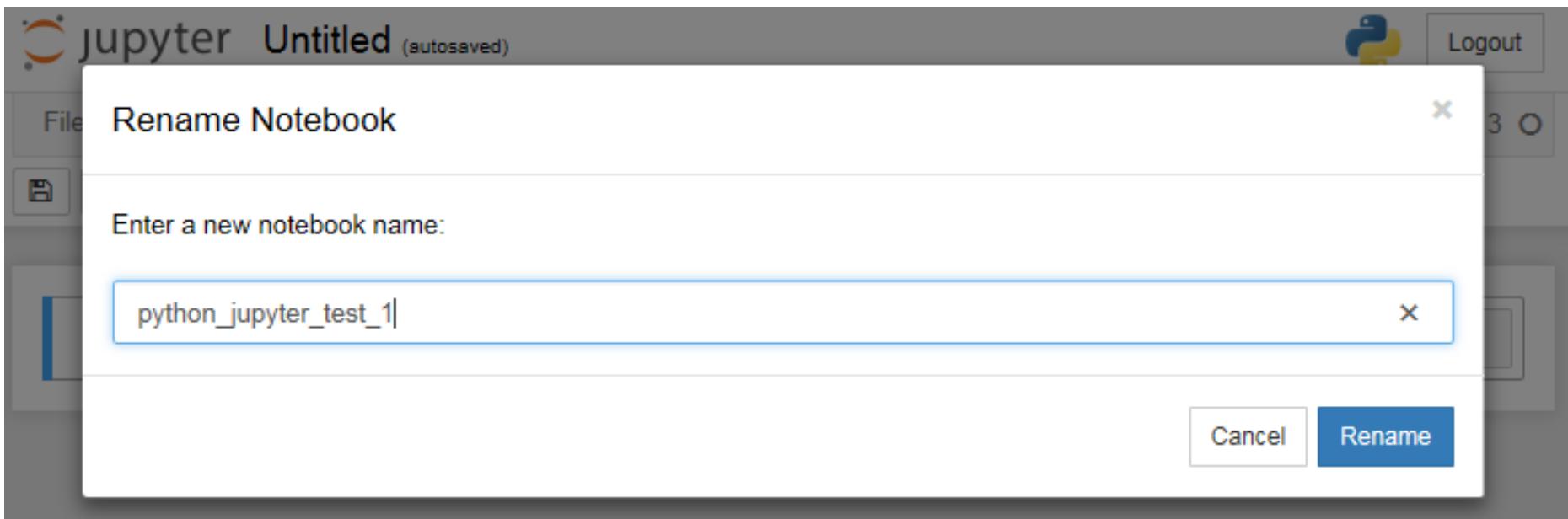
# Jupyter Notebook

Click File and then click on Rename...



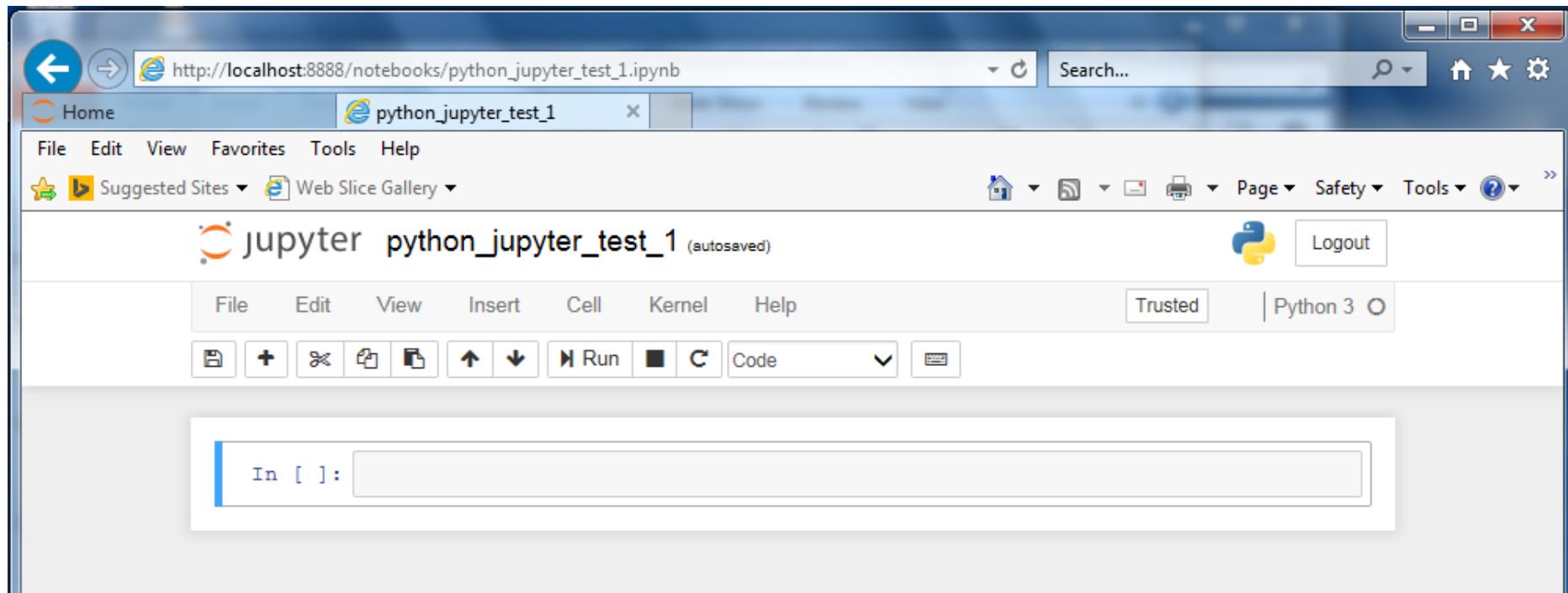
# Jupyter Notebook

Rename the file...



# Jupyter Notebook

## Jupyter now with the renamed file...

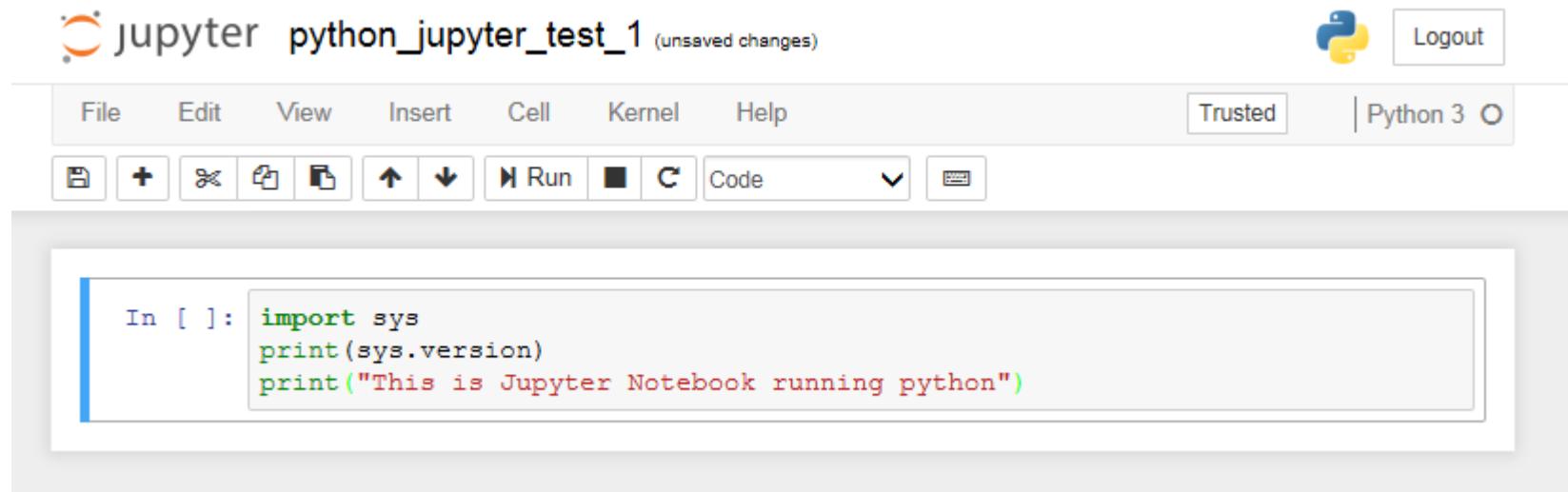


File manager now shows the file renamed...

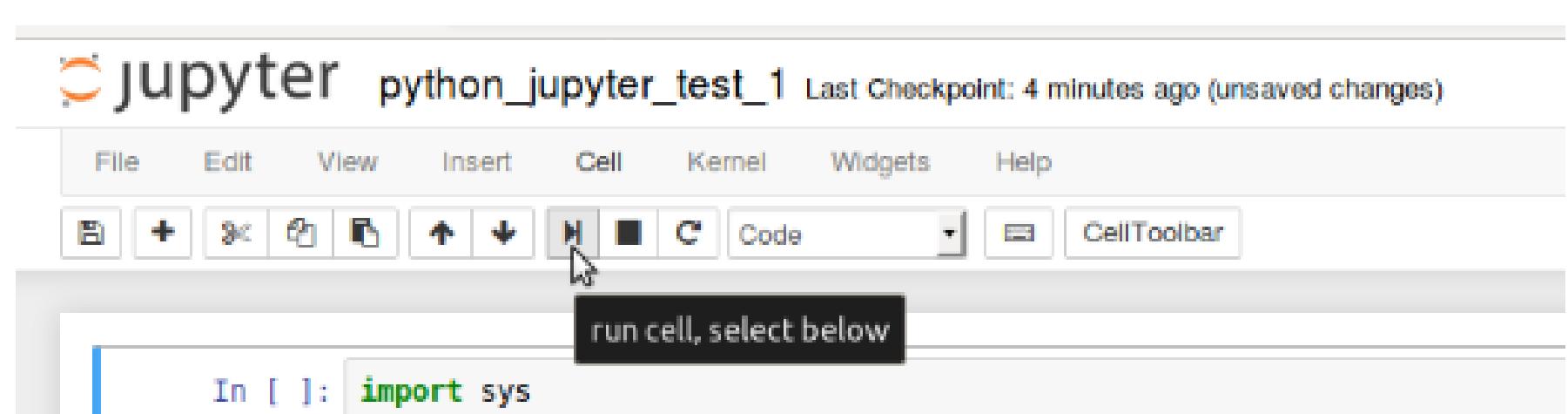
Searches	1/01/2018 1:16 p.m.	File folder
python_jupyter_test_1.ipynb	1/01/2018 9:21 p.m.	IPYNB File

# Jupyter Notebook

Write python code in a cell...

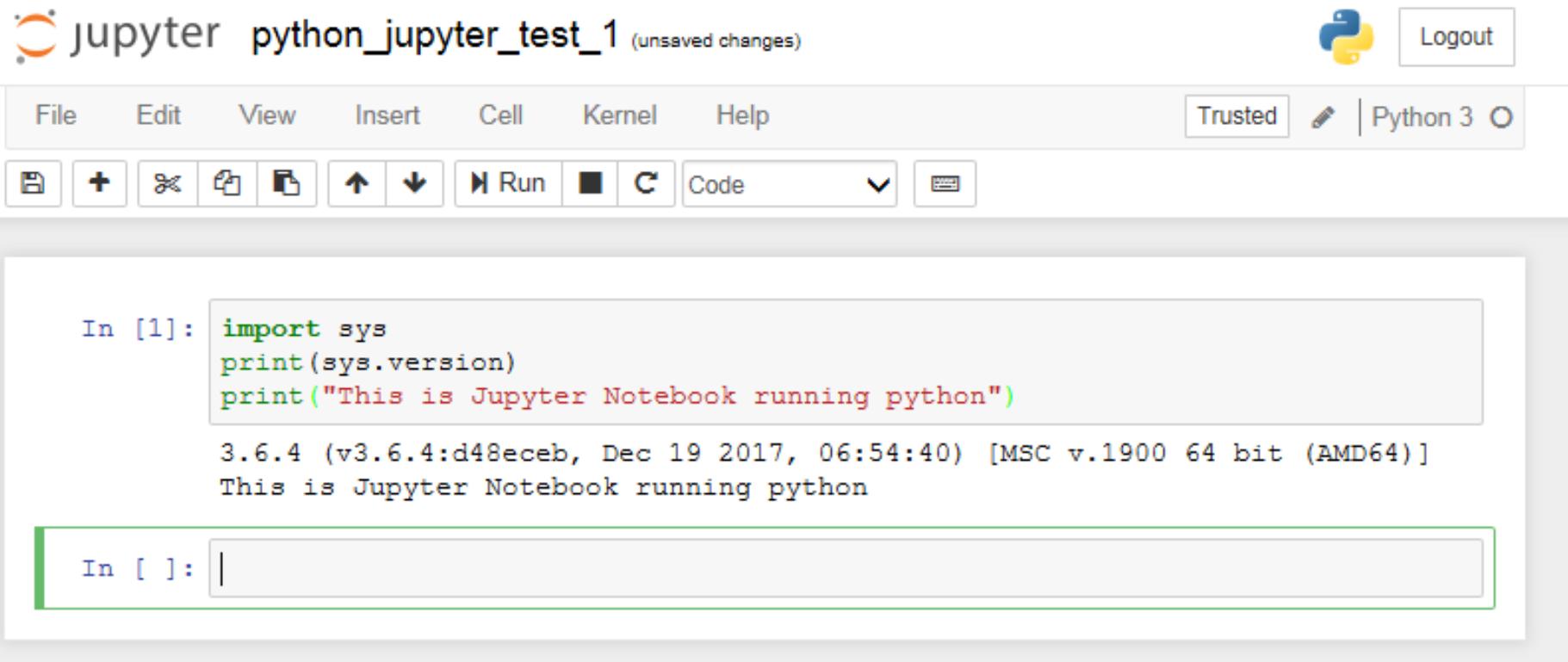


Click: Run icon to execute the code...



# Jupyter Notebook

The code executes and output is displayed...



A screenshot of a Jupyter Notebook interface. At the top, there's a title bar with the text "jupyter python\_jupyter\_test\_1 (unsaved changes)" and icons for Python (yellow and blue snake) and Logout. Below the title bar is a menu bar with File, Edit, View, Insert, Cell, Kernel, and Help. To the right of the menu bar are buttons for Trusted, a pencil icon, Python 3, and a dropdown arrow. Below the menu bar is a toolbar with icons for file operations like Open, Save, and Run. The main area shows a code cell labeled "In [1]:" containing Python code: "import sys", "print(sys.version)", and "print("This is Jupyter Notebook running python")". The output of the code is displayed below the cell, showing the Python version "3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]" and the printed message "This is Jupyter Notebook running python". A new cell input field is shown at the bottom left, labeled "In [ ]:".

```
In [1]: import sys  
print(sys.version)  
print("This is Jupyter Notebook running python")  
  
3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:54:40) [MSC v.1900 64 bit (AMD64)]  
This is Jupyter Notebook running python  
  
In [ ]:
```

...after execution a new cell is created

# Desktop

Notepad++ Main code

```
2 #!
3 # python_prog_1.py
4 import sys
5 print("This program is: {}".format(sys.argv[0]))
6 for i in range(5):
7     print(i)
8
9     input("Hit Return key to end program")
10
11 """
12 Test program written using notepad++
--
```

length: Ln:8 Col:5 Sel:0|0 Windows (CR LF)

Sec Command Prompt - python python\_prog\_1.py

```
Volume Serial Number is 6073-8AF0
Directory of C:\Users\User\Desktop
02/01/2018  11:26 a.m.    <DIR> .
02/01/2018  11:26 a.m.    <DIR> ..
01/01/2018  01:53 p.m.        198 Jupyter
01/01/2018  01:53 p.m.        903 Jupyter
01/01/2018  01:53 p.m.        518 Jupyter
01/01/2018  01:53 p.m.        161 Python
01/01/2018  01:53 p.m.        366 Python
02/01/2018  11:26 a.m.        296 Python
02/01/2018  11:26 a.m.        917 Setti
01/01/2018  01:53 p.m.        243 test_
01/01/2018  01:53 p.m.          8 File(s)   ,764,602 bytes
                           2 Dir(s)  101,9,501,824 bytes
```

Cmd window Run program

```
C:\Users\User\Desktop>python python_prog_1.py
This program is: python_prog_1.py
```

[I 1 0]
[W 1 1]
[I 1 2]
[I 1 3]
[W 1 4]

Jupyter code snippets

In [1]:  
for i in range(5):  
 print(i)

```
0  
1  
2  
3  
4
```

In [ ]:

# Jupyter Notebook

End of Jupyter Notebook installation.

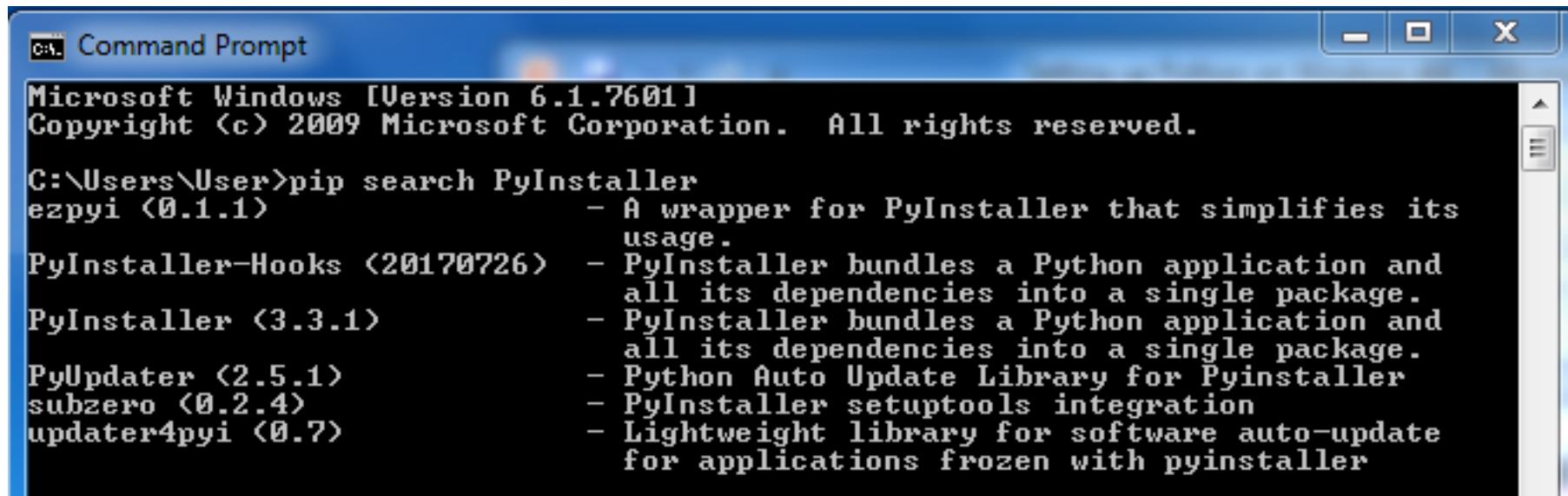
# PyInstaller

*PyInstaller* bundles a Python application and all its dependencies into a single package.

[https://  
pyinstaller.readthedocs.io/en/stable/](https://pyinstaller.readthedocs.io/en/stable/)

# PyInstaller

Use pip to search for PyInstaller...



```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\User>pip search PyInstaller
ezpyi <0.1.1>           - A wrapper for PyInstaller that simplifies its usage.
PyInstaller-Hooks <20170726> - PyInstaller bundles a Python application and all its dependencies into a single package.
PyInstaller <3.3.1>         - PyInstaller bundles a Python application and all its dependencies into a single package.
PyUpdater <2.5.1>          - Python Auto Update Library for Pyinstaller
subzero <0.2.4>            - PyInstaller setuptools integration
updater4pyi <0.7>          - Lightweight library for software auto-update for applications frozen with pyinstaller
```

# PyInstaller

## Use pip to install PyInstaller...

```
C:\Users\User>pip install PyInstaller
Collecting PyInstaller
  Using cached PyInstaller-3.3.1.tar.gz
Requirement already satisfied: setuptools in c:\users\user\appdata\local\programs\python\python36\lib\site-packages (from PyInstaller)
Collecting pefile>=2017.8.1 (from PyInstaller)
  Using cached pefile-2017.11.5.tar.gz
Collecting macholib>=1.8 (from PyInstaller)
  Using cached macholib-1.9-py2.py3-none-any.whl
Collecting future (from PyInstaller)
  Using cached future-0.16.0.tar.gz
Collecting pywin32 (from PyInstaller)
  Downloading pywin32-223-py3-none-any.whl
Collecting altgraph>=0.15 (from macholib>=1.8->PyInstaller)
  Using cached altgraph-0.15-py2.py3-none-any.whl
Collecting pywin32>=223 (from pywin32->PyInstaller)
  Downloading pywin32-223-cp36-cp36m-win_amd64.whl (9.0MB)
    100% ! ! ! 9.0MB 77kB/s
Installing collected packages: future, pefile, altgraph, macholib, pywin32, pywin32, PyInstaller
  Running setup.py install for future ... done
  Running setup.py install for pefile ... done
  Running setup.py install for PyInstaller ... done
Successfully installed PyInstaller-3.3.1 altgraph-0.15 future-0.16.0 macholib-1.9 pefile-2017.11.5 pywin32-223 pywin32-223

C:\Users\User>
```

# PyInstaller

## Verify PyInstaller is installed OK...

```
C:\ Command Prompt
C:\Users\User>
C:\Users\User>pyinstaller --version
3.3.1

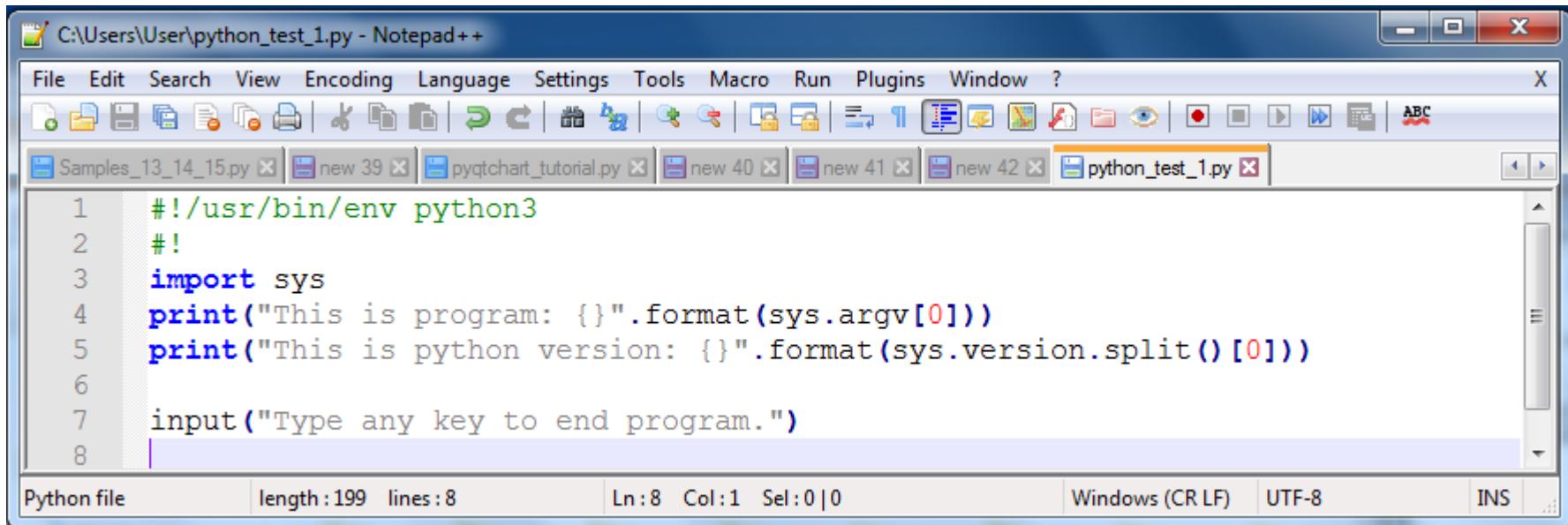
C:\Users\User>pyinstaller --help
usage: pyinstaller [-h] [-v] [-D] [-F] [--specpath DIR] [-n NAME]
                   [--add-data <SRC;DEST or SRC:DEST>]
                   [--add-binary <SRC;DEST or SRC:DEST>] [-p DIR]
                   [--hidden-import MODULENAME]
                   [--additional-hooks-dir HOOKSPATH]
                   [--runtime-hook RUNTIME_HOOKS] [--exclude-module EXCLUDES]
                   [--key KEY] [-d] [-s] [--noupx] [-c] [-w]
                   [-i <FILE.ico or FILE.exe.ID or FILE.icns>]
                   [--version-file FILE] [-m <FILE or XML>] [-r RESOURCE]
                   [--uac-admin] [--uac-uiaccess] [--win-private-assemblies]
                   [--win-no-prefer-redirects]
                   [--osx-bundle-identifier BUNDLE_IDENTIFIER]
                   [--runtime-tmpdir PATH] [--distpath DIR]
                   [--workpath WORKPATH] [-y] [--upx-dir UPX_DIR] [-a]
                   [--clean] [--log-level LEVEL]
                   scriptname [scriptname ...]

positional arguments:
  scriptname            name of scriptfiles to be processed or exactly one
                        .spec-file. If a .spec-file is specified, most options
                        are unnecessary and are ignored.

optional arguments:
  -h, --help             show this help message and exit
  -v, --version          Show program version info and exit.
  --distpath DIR         Where to put the bundled app (default: .\dist)
  --workpath WORKPATH   Where to put all the temporary work files, .log, .pyz
                        and etc. (default: .\build)
  -y, --noconfirm        Replace output directory (default:
```

# PyInstaller

Write a simple Test program...



C:\Users\User\python\_test\_1.py - Notepad++

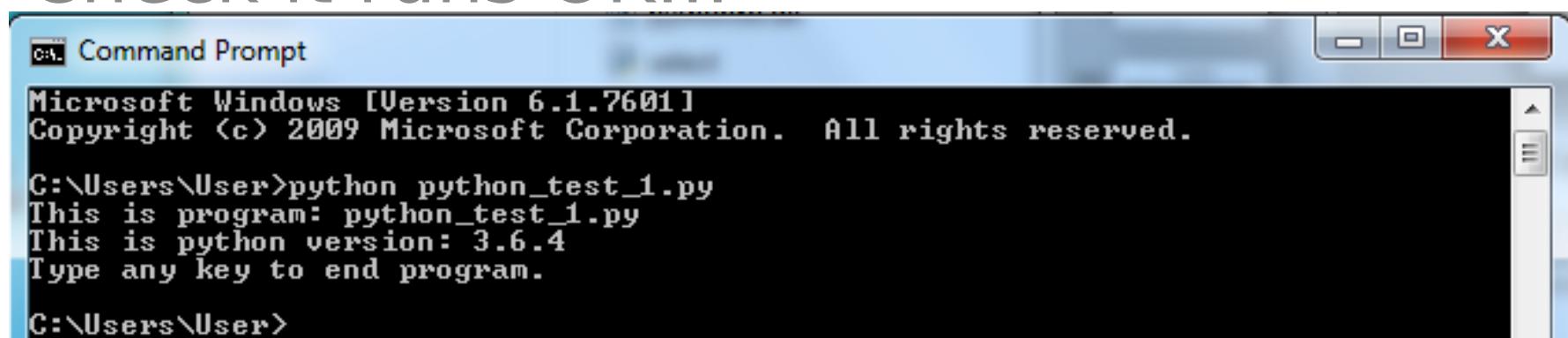
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

Samples\_13\_14\_15.py new 39 pyqtchart\_tutorial.py new 40 new 41 new 42 python\_test\_1.py

```
1 #!/usr/bin/env python3
2 #
3 import sys
4 print("This is program: {}".format(sys.argv[0]))
5 print("This is python version: {}".format(sys.version.split()[0]))
6
7 input("Type any key to end program.")
```

Python file length : 199 lines : 8 Ln:8 Col:1 Sel:0|0 Windows (CR LF) UTF-8 INS

Check it runs OK...



c:\ Command Prompt

Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

```
C:\Users\User>python python_test_1.py
This is program: python_test_1.py
This is python version: 3.6.4
Type any key to end program.

C:\Users\User>
```

# PyInstaller

pyinstaller --onefile python\_test\_1.py...

```
C:\Users\User>
C:\Users\User>pyinstaller --onefile python_test_1.py
93 INFO: PyInstaller: 3.3.1
93 INFO: Python: 3.6.4
93 INFO: Platform: Windows-7-6.1.7601-SP1
93 INFO: wrote C:\Users\User\python_test_1.spec
93 INFO: UPX is not available.
93 INFO: Extending PYTHONPATH with paths
['C:\\\\Users\\\\User', 'C:\\\\Users\\\\User']
93 INFO: checking Analysis
109 INFO: Building because inputs changed
109 INFO: Initializing module dependency graph...
109 INFO: Initializing module graph hooks...
109 INFO: Analyzing base_library.zip ...
5210 INFO: running Analysis out00-Analysis.toc
5210 INFO: Adding Microsoft.Windows.Common-Controls to dependent assemblies of final executable
         required by c:\\users\\user\\appdata\\local\\programs\\python\\python36\\python.exe
6193 INFO: Caching module hooks...
6193 INFO: Analyzing C:\\Users\\User\\python_test_1.py
6208 INFO: Loading module hooks...
6208 INFO: Loading module hook "hook-encodings.py"...
6349 INFO: Loading module hook "hook-pydoc.py"...
6349 INFO: Loading module hook "hook-xml.py"...
6770 INFO: Looking for ctypes DLLs
6770 INFO: Analyzing run-time hooks ...
6770 INFO: Looking for dynamic libraries
6895 INFO: Looking for eggs
6895 INFO: Using Python library c:\\users\\user\\appdata\\local\\programs\\python\\python36\\python36.dll
6895 INFO: Found binding redirects:
[]
```

...continues...

# PyInstaller

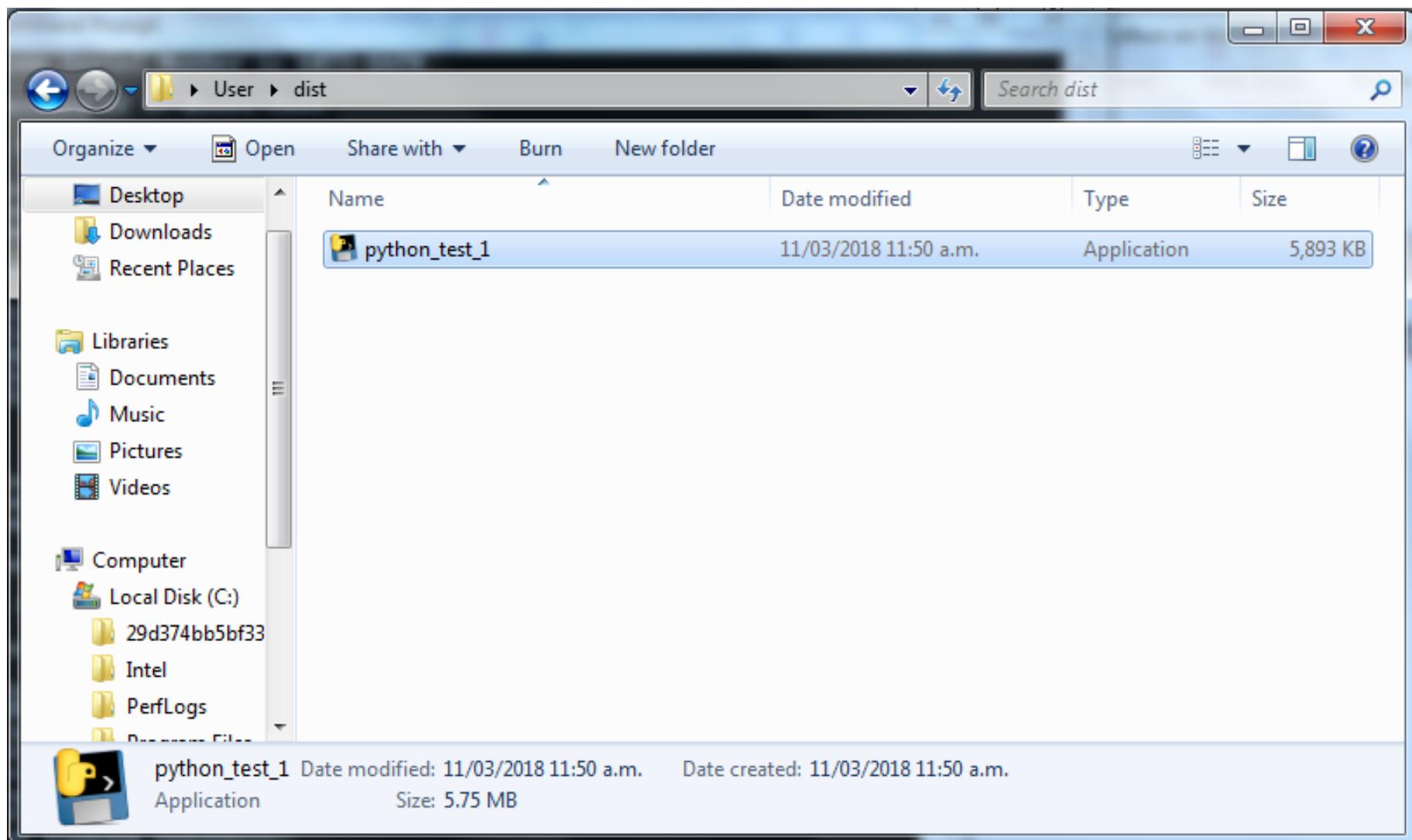
...continuing creating one .exe file for Windows...

```
6910 INFO: Warnings written to C:\Users\User\build\python_test_1\warnpython_test_1.txt
6988 INFO: Graph cross-reference written to C:\Users\User\build\python_test_1\xref-python_test_1.html
7020 INFO: checking PYZ
7035 INFO: Building because toc changed
7035 INFO: Building PYZ (ZlibArchive) C:\Users\User\build\python_test_1\out00-PYZ.pyz
7284 INFO: Building PYZ (ZlibArchive) C:\Users\User\build\python_test_1\out00-PYZ.pyz completed successfully.
7800 INFO: checking PKG
7800 INFO: Building because toc changed
7800 INFO: Building PKG (CArchive) out00-PKG.pkg
9890 INFO: Building PKG (CArchive) out00-PKG.pkg completed successfully.
9906 INFO: Bootloader c:\users\user\appdata\local\programs\python\python36\libs\site-packages\PyInstaller\bootloader\Windows-64bit\run.exe
9906 INFO: checking EXE
9906 INFO: Rebuilding out00-EXE.toc because python_test_1.exe missing
9906 INFO: Building EXE from out00-EXE.toc
9906 INFO: Appending archive to EXE C:\Users\User\dist\python_test_1.exe
9984 INFO: Building EXE from out00-EXE.toc completed successfully.
```

C:\Users\User>

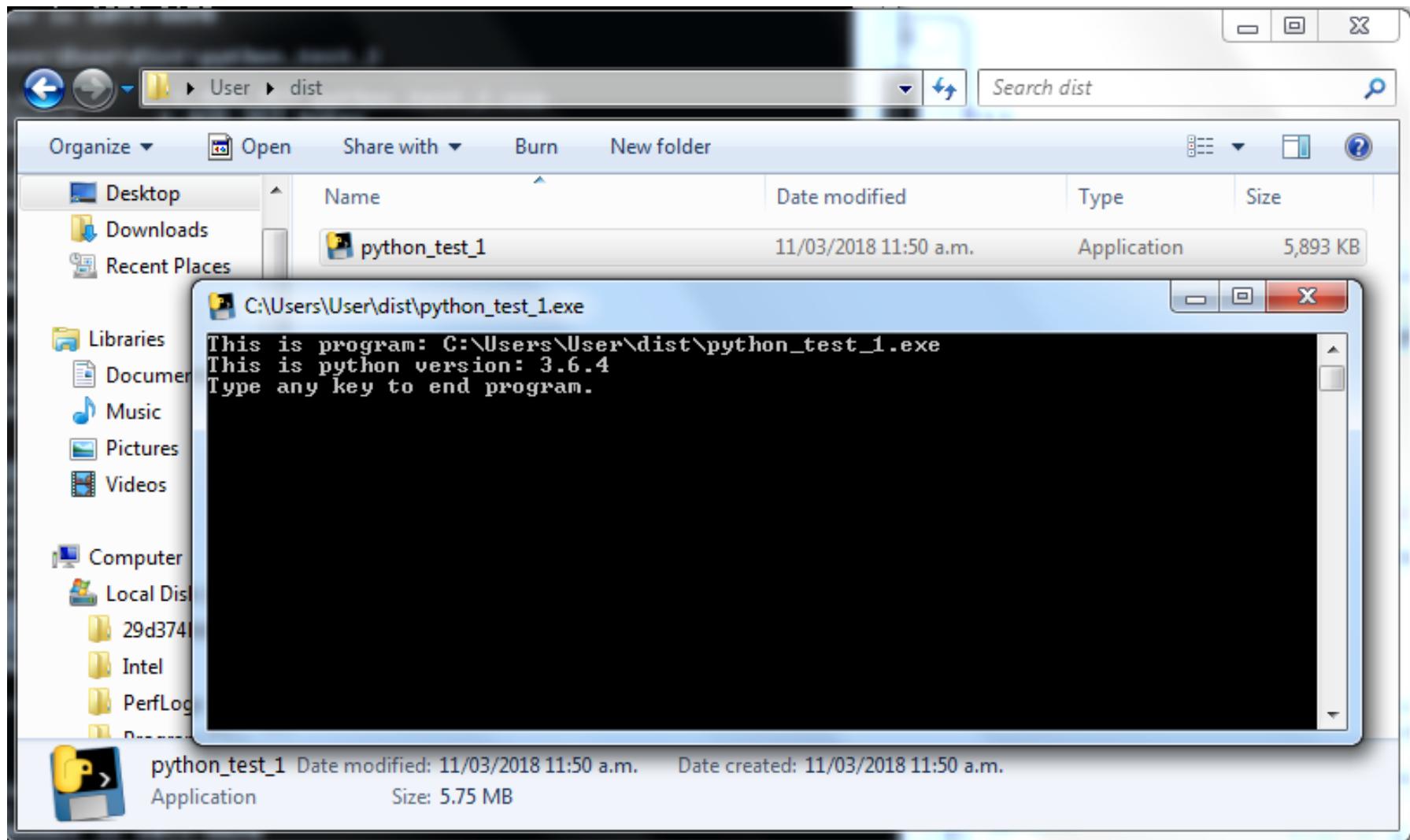
# PyInstaller

Double-click to check the file has been created OK...



# PyInstaller

Command window opens and program runs...



Do the PIP install...

# PyInstaller

Copy program to “Test” account...

```
Administrator: Command Prompt

C:\Users\Test>dir C:\Users\User\dist\python_test_1.exe
Volume in drive C has no label.
Volume Serial Number is 6073-8AF0

Directory of C:\Users\User\dist

11/03/2018  11:50 a.m.      6,034,045 python_test_1.exe
               1 File(s)     6,034,045 bytes
                  0 Dir(s)  83,628,498,944 bytes free

C:\Users\Test>copy C:\Users\User\dist\python_test_1.exe *.*
               1 file(s) copied.

C:\Users\Test>dir *.exe
Volume in drive C has no label.
Volume Serial Number is 6073-8AF0

Directory of C:\Users\Test

11/03/2018  11:50 a.m.      6,034,045 python_test_1.exe
               1 File(s)     6,034,045 bytes
                  0 Dir(s)  83,622,461,440 bytes free

C:\Users\Test>
```

i.e. Distribution of executable.

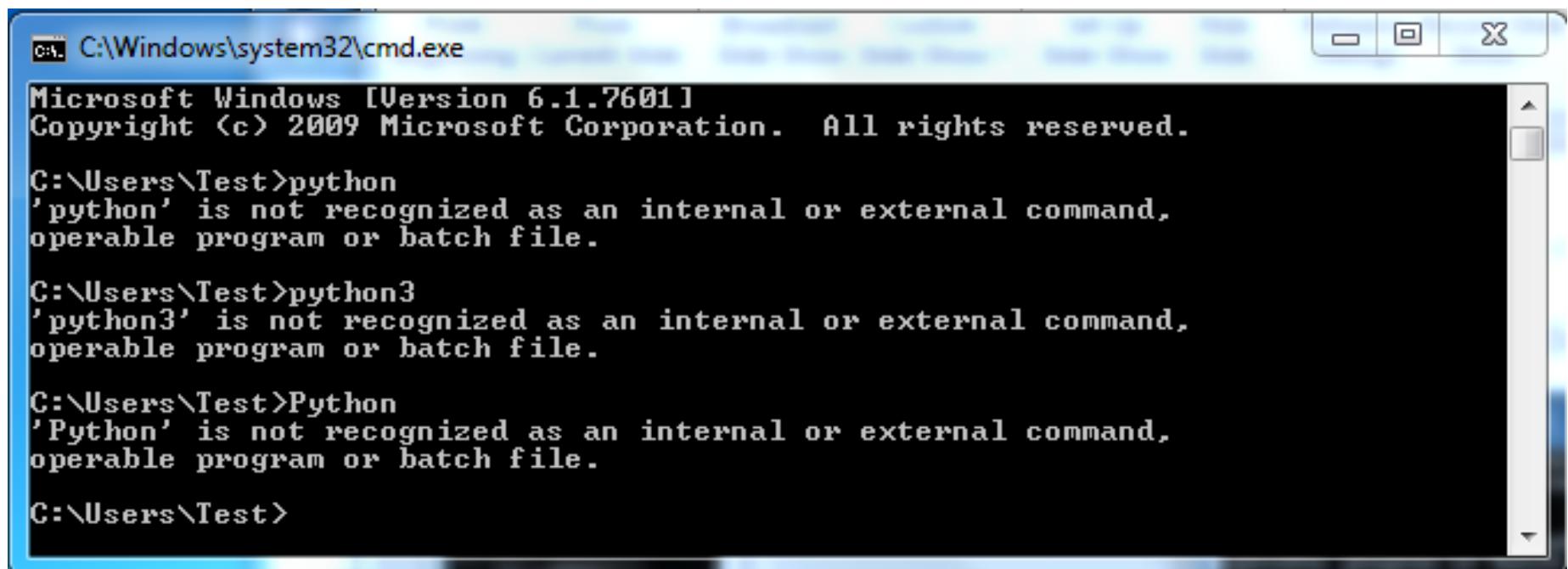
# PyInstaller

Log out of “User” account.

Log into: “Test” account.

# PyInstaller

“Test” account does not recognise Python /  
consider Python to be installed...



A screenshot of a Windows Command Prompt window titled "C:\Windows\system32\cmd.exe". The window shows the following text output:

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Test>python
'python' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Test>python3
'python3' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Test>Python
'Python' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Test>
```

# PyInstaller

From “Test” account, run python\_test\_1.exe  
~ 6MB file

The screenshot shows a Windows Command Prompt window titled 'C:\Windows\system32\cmd.exe'. The command 'dir \*.exe' is run, showing the creation of 'python\_test\_1.exe' on 11/03/2018 at 11:50 a.m. with a size of 6,034,045 bytes. The command 'python\_test\_1.exe' is then run, displaying its own details and a message to end the program.

```
C:\Users\Test>dir *.exe
Volume in drive C has no label.
Volume Serial Number is 6073-8AF0

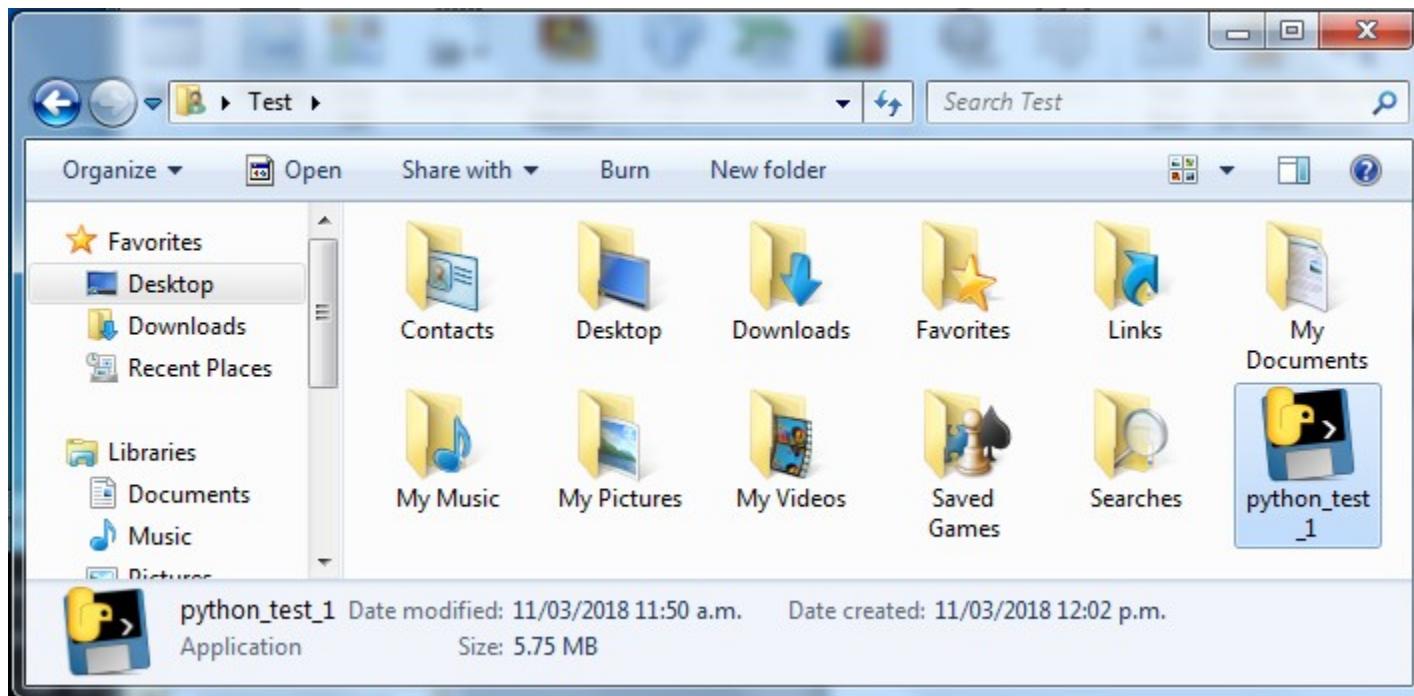
Directory of C:\Users\Test

11/03/2018  11:50 a.m.      6,034,045 python_test_1.exe
               1 File(s)     6,034,045 bytes
               0 Dir(s)  83,623,374,848 bytes free

C:\Users\Test>python_test_1.exe
This is program: python_test_1.exe
This is python version: 3.6.4
Type any key to end program.
```

# PyInstaller

Program may also be run by double-clicking on file...



```
C:\Users\Test\python_test_1.exe
This is program: C:\Users\Test\python_test_1.exe
This is python version: 3.6.4
Type any key to end program.
```

# PyInstaller

End of PyInstaller presentation.

# Learning Python using Jupyter Notebook

In 2017 Lawrence D'Oliveiro delivered two “Introduction to Python” presentations to the Hamilton Python Users Group . He delivered the presentation using Jupyter Notebook. His ipynb files may be obtained from:

<https://github.com/HamPUG/meetings/tree/master/2017/2017-03-13/lndo>

and

<https://github.com/HamPUG/meetings/tree/master/2017/2017-04-10/lndo>

Plus the 12 March 2018 presentation:

<https://github.com/HamPUG/meetings/tree/master/2018/2018-03-12>

# End of Presentation

## Questions

# Addendum for PyInstaller

# PyInstaller – Code that doesn't work

Program: python\_test\_2.py...

```
1 #!/usr/bin/env python3
2 #
3 import sys
4 print("This is program: {}".format(sys.argv[0]))
5 print("This is python version: {}".format(sys.version.split()[0]))
6
7 string = ""
8 with open(sys.argv[0], "r") as f:
9     for line in f:
10         string += line
11
12
13 print("\nOUTPUT OF THE PROGRAM:\n")
14 print(string)
15
16 input("Type any key to end program.")
```

# PyInstaller – Code that doesn't work

Program Runs OK: python python\_test\_2.py

```
c:\ Command Prompt - python python_test_2.py
C:\Users\User>python python_test_2.py
This is program: python_test_2.py
This is python version: 3.6.4

OUTPUT OF THE PROGRAM:

#!/usr/bin/env python3
#!
import sys
print("This is program: {}".format(sys.argv[0]))
print("This is python version: {}".format(sys.version.split()[0]))

string = ""
with open(sys.argv[0], "r") as f:
    for line in f:
        string += line

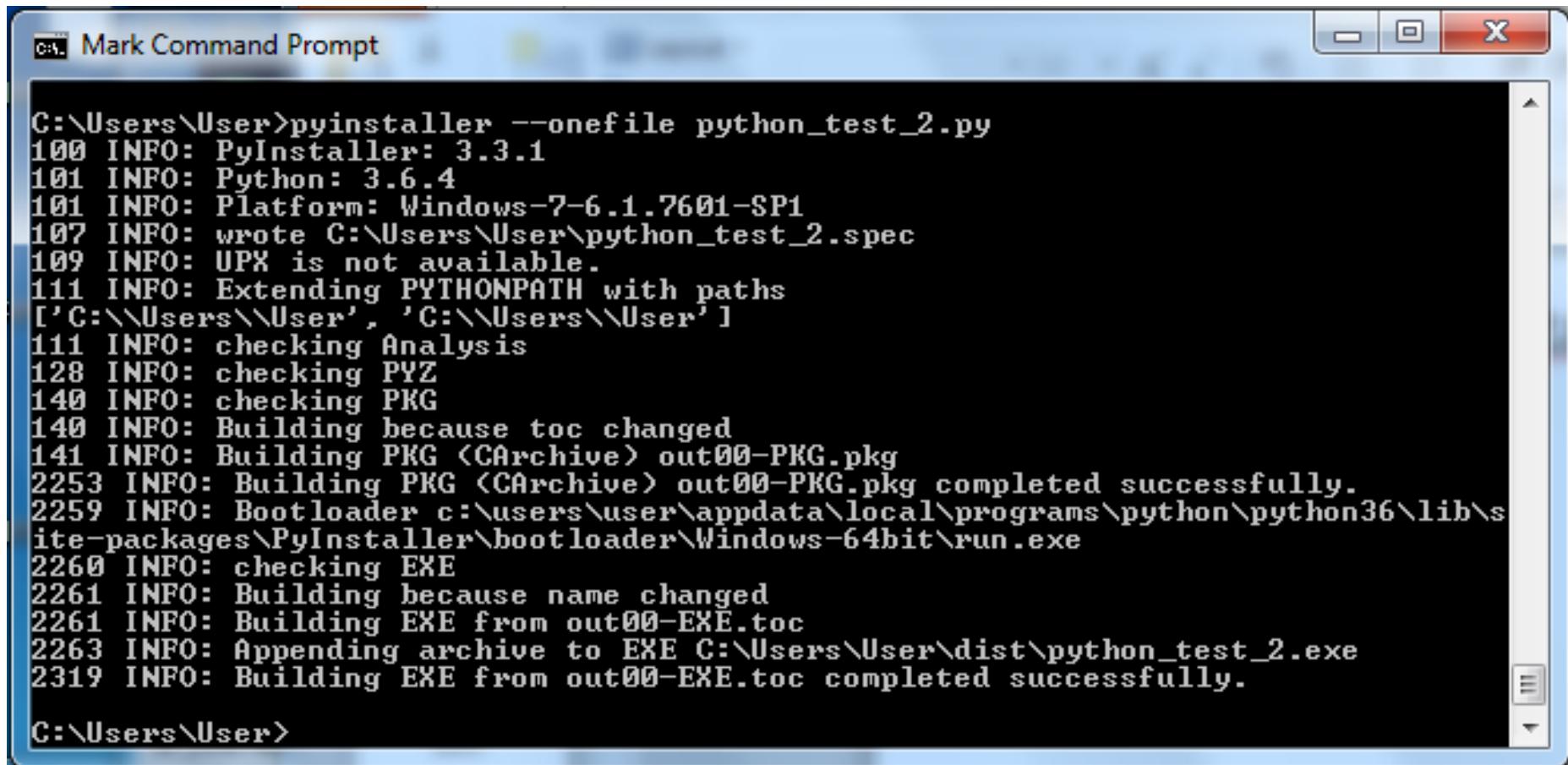
print("\nOUTPUT OF THE PROGRAM:\n")
print(string)

input("Type any key to end program.")

Type any key to end program.
```

# PyInstaller – Code that doesn't work

PyInstaller converts program converts to .exe OK...



```
C:\Users\User>pyinstaller --onefile python_test_2.py
100 INFO: PyInstaller: 3.3.1
101 INFO: Python: 3.6.4
101 INFO: Platform: Windows-7-6.1.7601-SP1
107 INFO: wrote C:\Users\User\python_test_2.spec
109 INFO: UPX is not available.
111 INFO: Extending PYTHONPATH with paths
['C:\\\\Users\\\\User', 'C:\\\\Users\\\\User']
111 INFO: checking Analysis
128 INFO: checking PYZ
140 INFO: checking PKG
140 INFO: Building because toc changed
141 INFO: Building PKG (CArchive) out00-PKG.pkg
2253 INFO: Building PKG (CArchive) out00-PKG.pkg completed successfully.
2259 INFO: Bootloader c:\\users\\user\\appdata\\local\\programs\\python\\python36\\lib\\site-packages\\PyInstaller\\bootloader\\Windows-64bit\\run.exe
2260 INFO: checking EXE
2261 INFO: Building because name changed
2261 INFO: Building EXE from out00-EXE.toc
2263 INFO: Appending archive to EXE C:\\Users\\User\\dist\\python_test_2.exe
2319 INFO: Building EXE from out00-EXE.toc completed successfully.

C:\Users\User>
```

# PyInstaller – Code that doesn't work

Run the .exe: python\_test\_2.exe

```
c:\ Command Prompt
C:\Users\User>cd dist
C:\Users\User\dist>dir python_test_2.exe
Volume in drive C has no label.
Volume Serial Number is 6073-8AF0

Directory of C:\Users\User\dist

11/03/2018  08:12 p.m.      6,037,022 python_test_2.exe
               1 File(s)     6,037,022 bytes
                  0 Dir(s)   83,426,566,144 bytes free

C:\Users\User\dist>python_test_2.exe
This is program: python_test_2.exe
This is python version: 3.6.4
Traceback (most recent call last):
  File "python_test_2.py", line 9, in <module>
    File "c:\users\user\appdata\local\programs\python\python36\lib\encodings\cp125
2.py", line 23, in decode
        return codecs.charmap_decode(input,self.errors,decoding_table)[0]
UnicodeDecodeError: 'charmap' codec can't decode byte 0x90 in position 2: charac
ter maps to <undefined>
[3424] Failed to execute script python_test_2

C:\Users\User\dist>
```

Unable to read: python\_test\_2.exe

end