

PYTHON PROGRAMMING

AN INTRODUCTION



SESSION OUTLINE

- Why Python?
- Python 2 vs. Python 3
- Python Installation
- Jupyter Notebooks
- Git and GitHub

WHY PYTHON?

- 1990 by Guido van Rossum
- Python 3 released on 2008
- Goal: Easy to use
- Goal: Easy to read
- More on Why
 - Easy to learn
 - Extensive libraries and tools!
 - Many applications
 - Focused on the developer

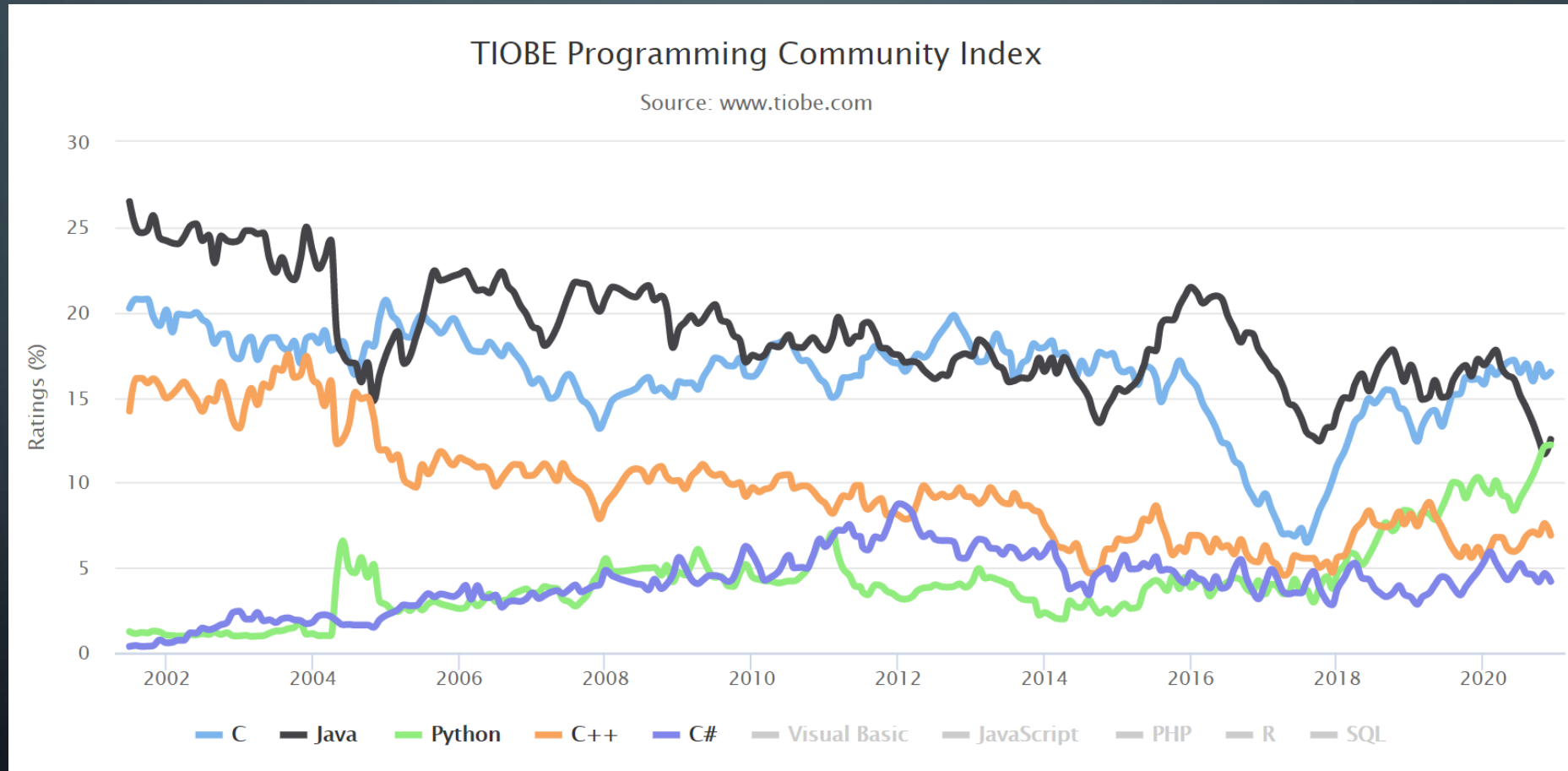
TIOBE INDEX

The TIOBE Programming Community index is an indicator of the popularity of programming languages. The index is updated once a month. The ratings are based on the number of skilled engineers world-wide, courses and third party vendors. Popular search engines such as Google, Bing, Yahoo!, Wikipedia, Amazon, YouTube and Baidu are used to calculate the ratings. It is important to note that the TIOBE index is not about the *best* programming language or the language in which *most lines of code* have been written.

The index can be used to check whether your programming skills are still up to date or to make a strategic decision about what programming language should be adopted when starting to build a new software system. The definition of the TIOBE index can be found [here](#).

Dec 2020	Dec 2019	Change	Programming Language	Ratings	Change
1	2	▲	C	16.48%	+0.40%
2	1	▼	Java	12.53%	-4.72%
3	3		Python	12.21%	+1.90%
4	4		C++	6.91%	+0.71%
5	5		C#	4.20%	-0.60%

TIOBE INDEX



DATA ANALYTICS AND WEB

- Libraries!
- NumPy and Pandas - Data Analysis with Python
- Large data sets
- Visualizations
- Machine Learning
- Web – Django and Flask
- piRover – Open Source CV

Python

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INSTALLING PYTHON

Download the latest version for Windows

Download Python 3.9.1

Looking for Python with a different OS? Python for [Windows](#),
[Linux/UNIX](#), [Mac OS X](#), [Other](#)

Want to help test development versions of Python? [Prereleases](#), [Docker images](#)

Looking for Python 2.7? See below for specific releases



Install Now

C:\Users\20FPython\AppData\Local\Programs\Python\Python39

Includes IDLE, pip and documentation

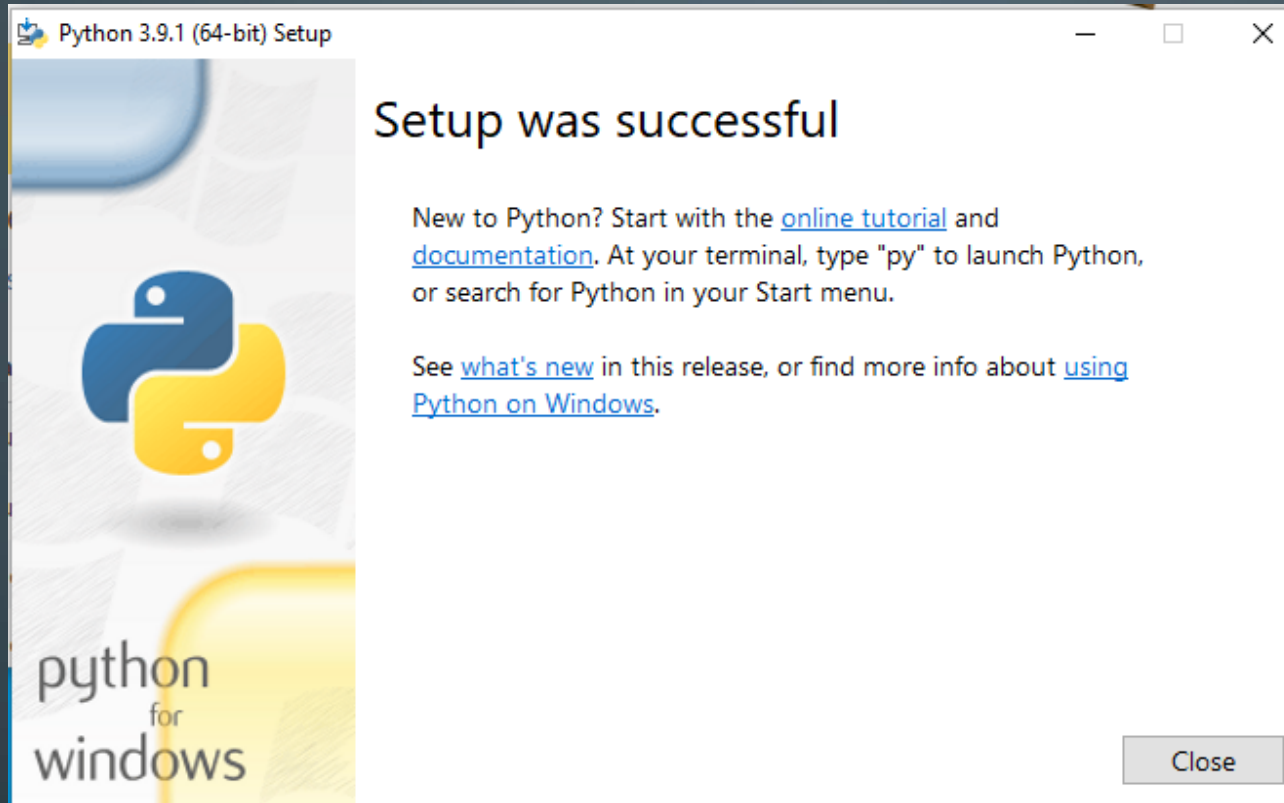
Creates shortcuts and file associations



Customize installation

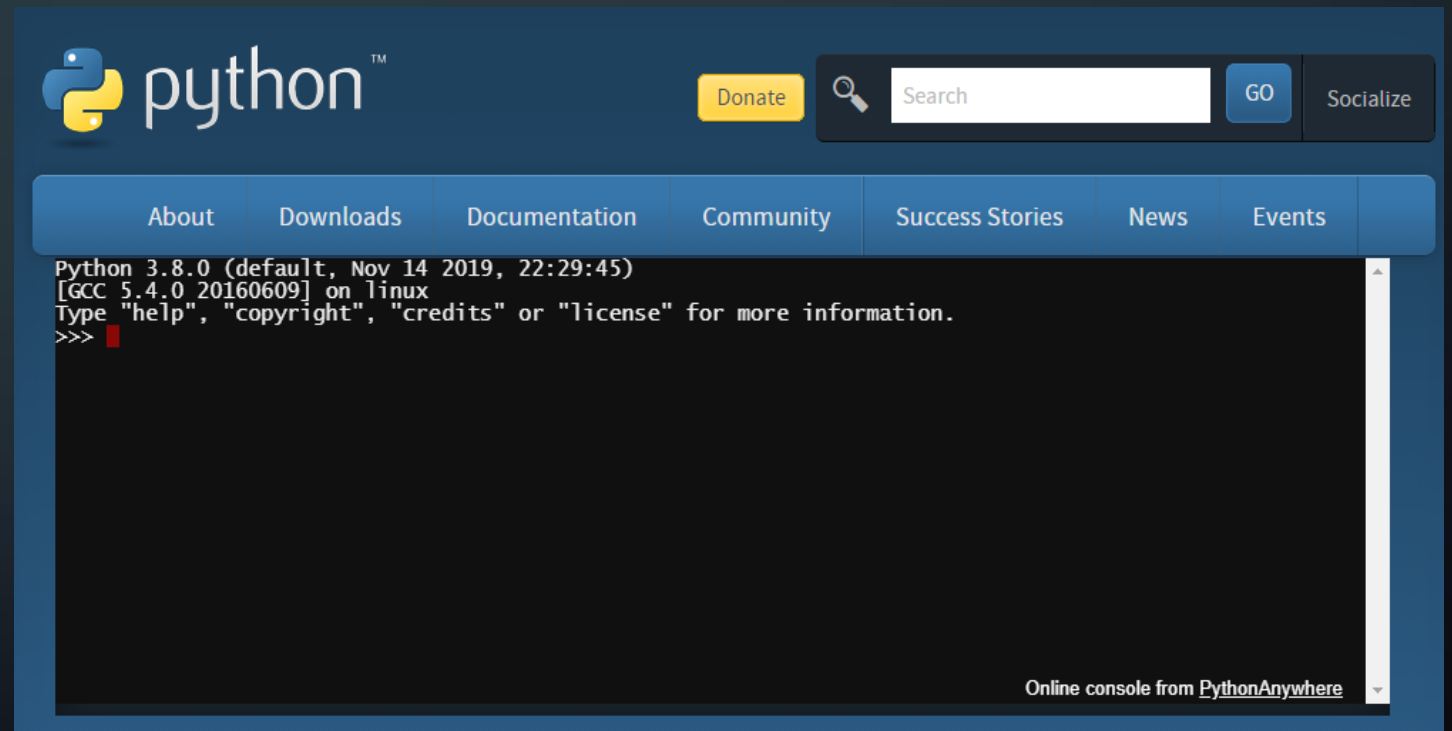
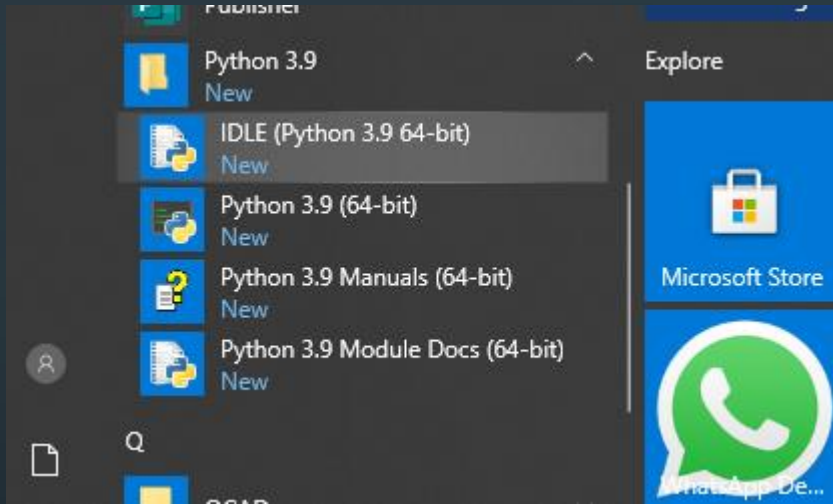
Choose location and features

INSTALLING PYTHON

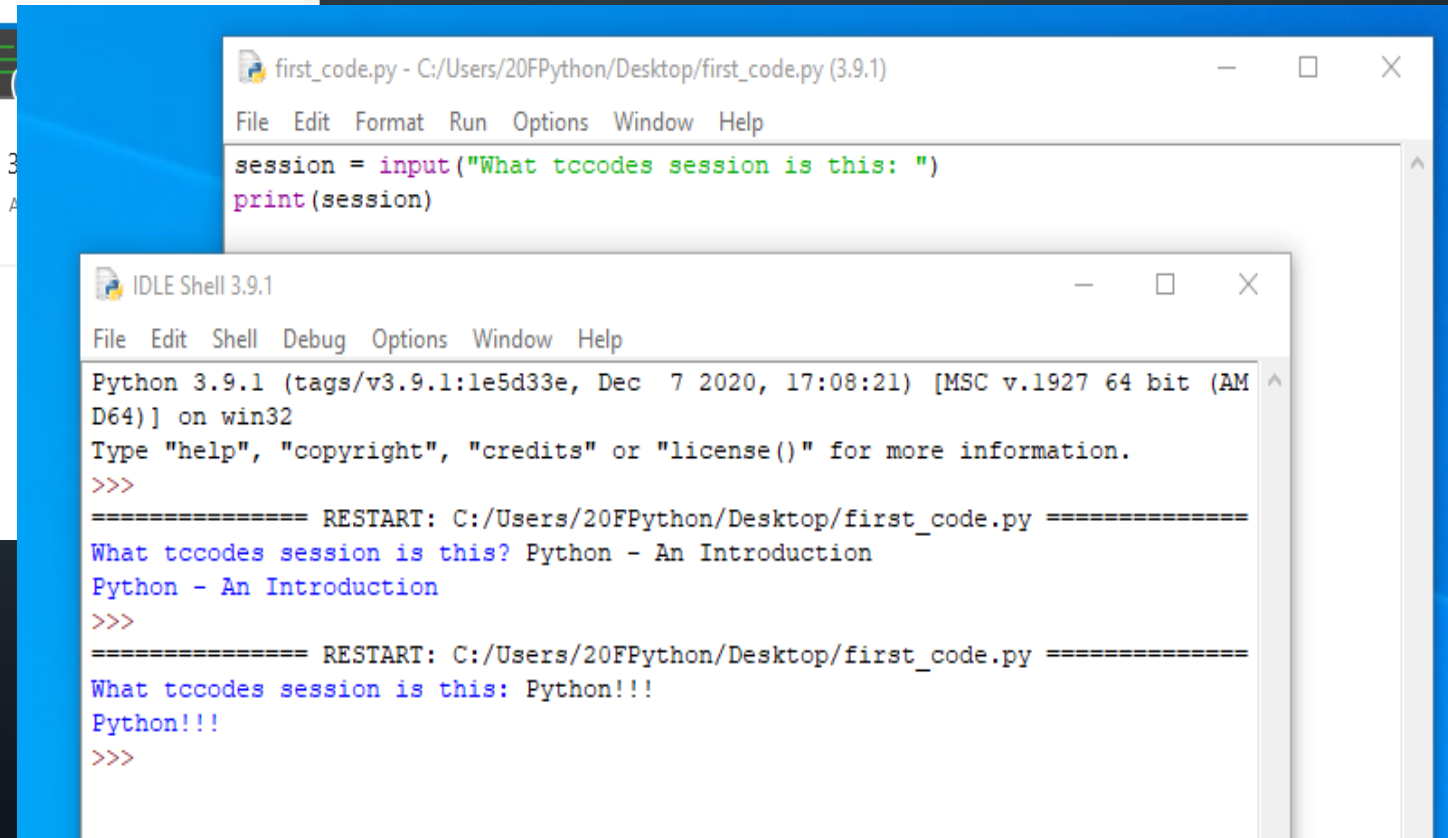
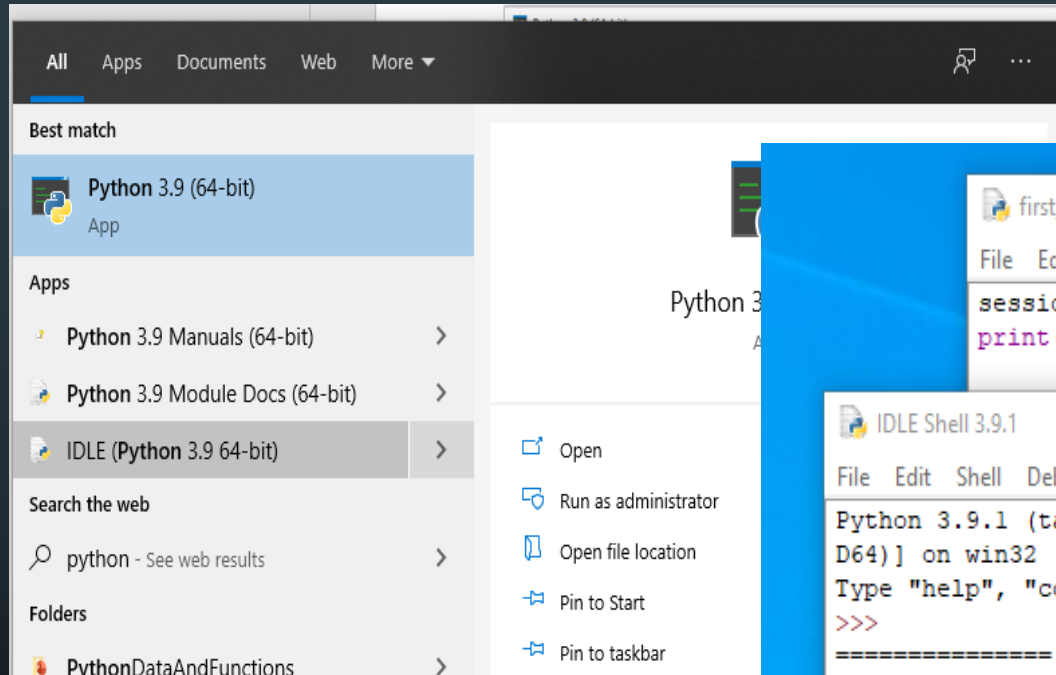


INSTALLING PYTHON

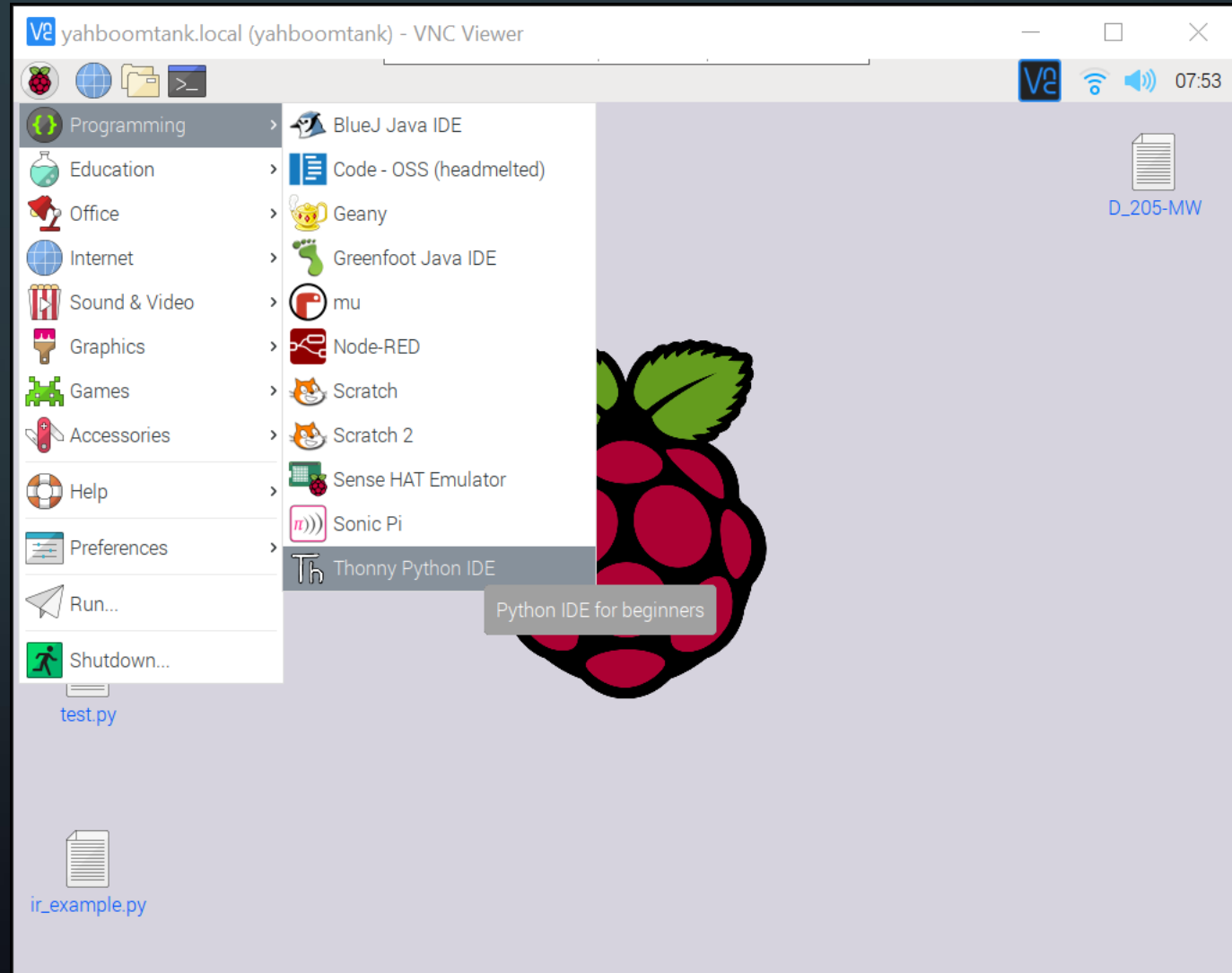
LAUNCH PYTHON - INTERACTIVE SHELL



LAUNCH PYTHON - IDLE



PYTHON ON RASPBERRY PI



Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

VISUAL STUDIO CODE - INSTALLATION

↓ Windows

Windows 7, 8, 10

↓ .deb

Debian, Ubuntu

↓ .rpm

Red Hat, Fedora, SUSE

↓ Mac

macOS 10.10+

User Installer	64 bit	32 bit	ARM
System Installer	64 bit	32 bit	ARM
.zip	64 bit	32 bit	ARM

.deb	64 bit	ARM	ARM 64
.rpm	64 bit	ARM	ARM 64
.tar.gz	64 bit	ARM	ARM 64

Snap Store

Overview

SETUP

GET STARTED

USER GUIDE

LANGUAGES

NODE.JS /
JAVASCRIPT

TYPESCRIPT

PYTHON

JAVA

C++

CONTAINERS

AZURE

REMOTE

Thanks for downloading VS Code for Windows!

Download not starting? Try this direct download link.

VISUAL STUDIO CODE - INSTALLATION

Getting Started

Visual Studio Code is a lightweight but powerful source code editor which runs on your desktop and is available for Windows, macOS and Linux. It comes with built-in support for JavaScript, TypeScript and Node.js and has a rich ecosystem of extensions for other languages (such as C++, C#, Java, Python, PHP, Go) and runtimes (such as .NET and Unity). Begin your journey with VS Code with these [introductory videos](#).

Visual Studio Code in Action

```
4 var server = express();  
5 server.use(bodyParser.json);
```

GETTING STARTED

VS Code in Action

Top Extensions

First Steps

Keyboard Shortcuts


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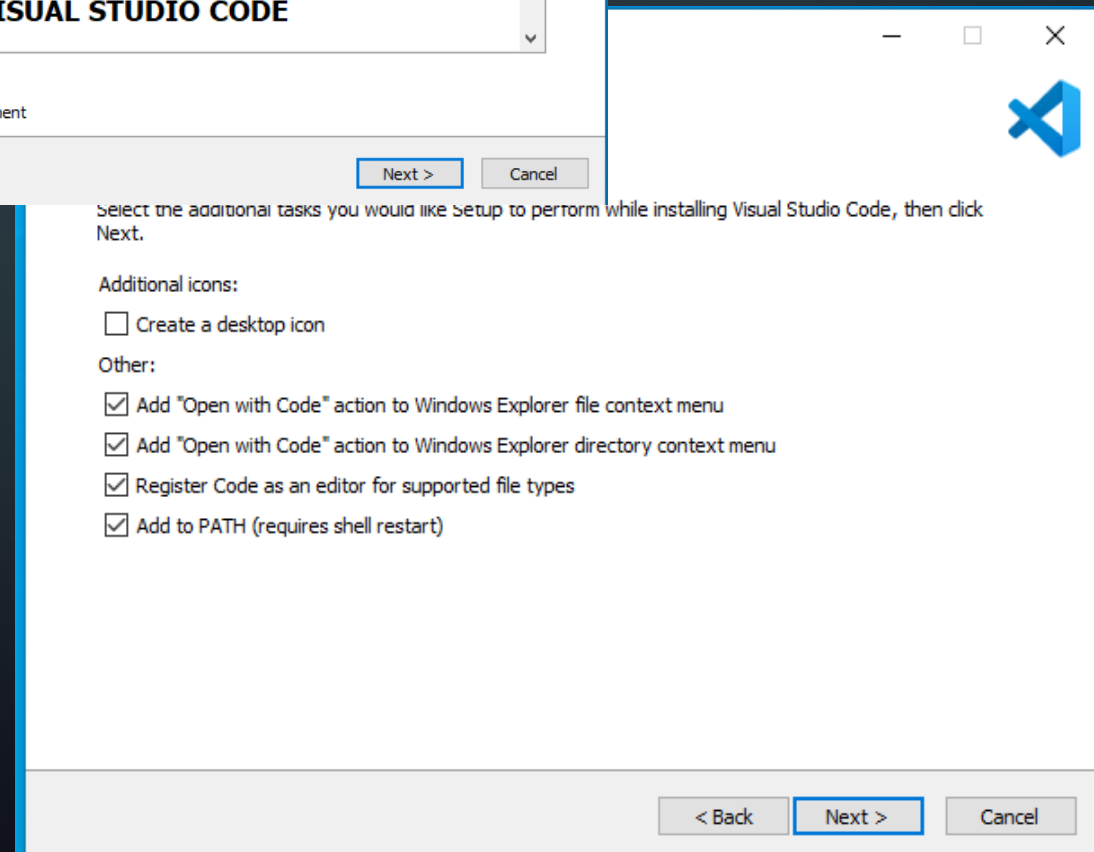
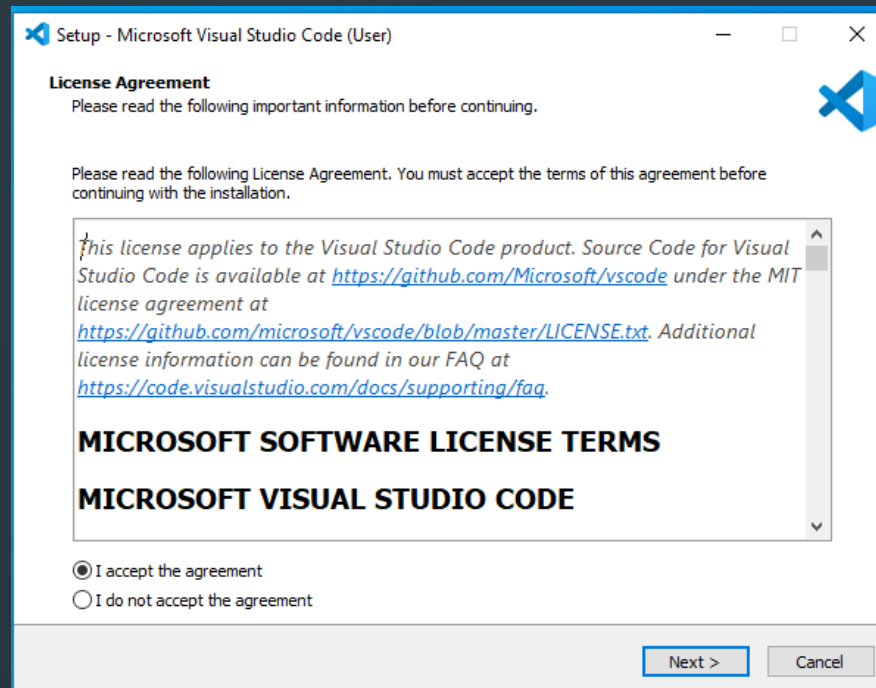
 Follow @code

 Request features

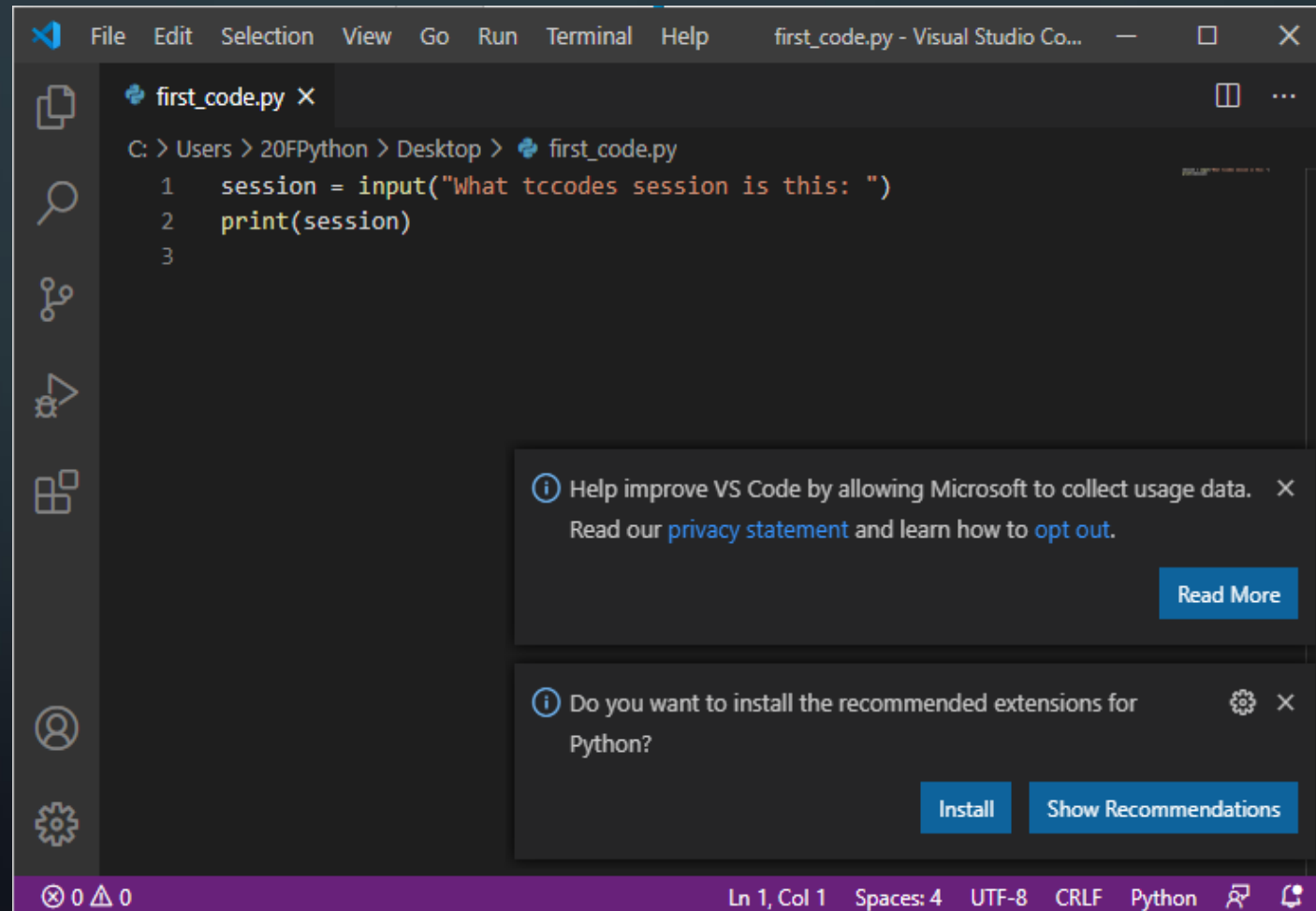
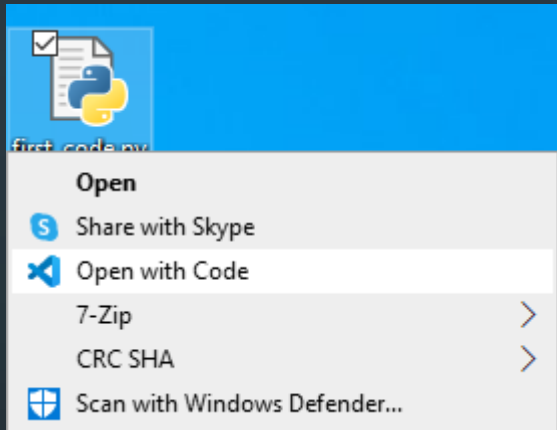
 Report issues

 Watch videos

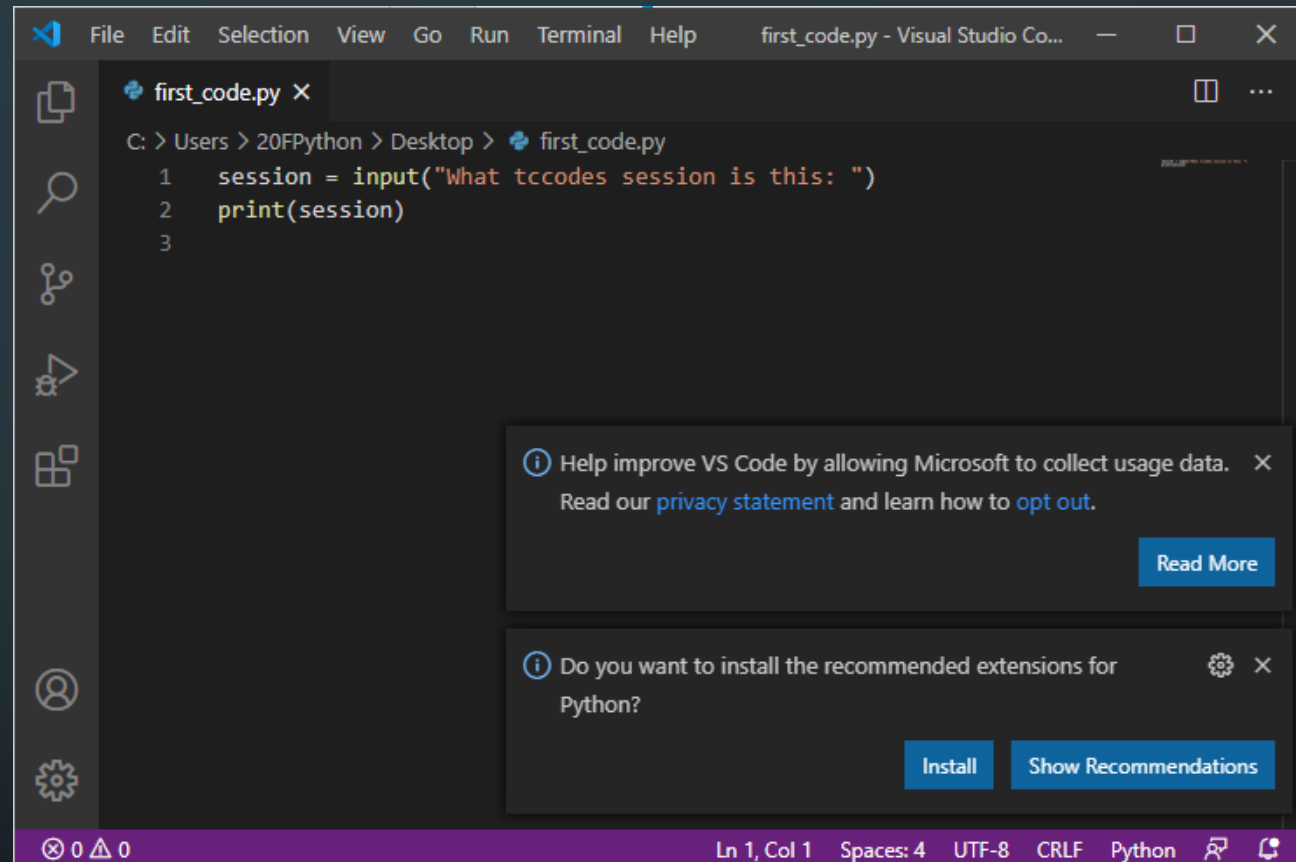
VISUAL STUDIO CODE - INSTALLATION



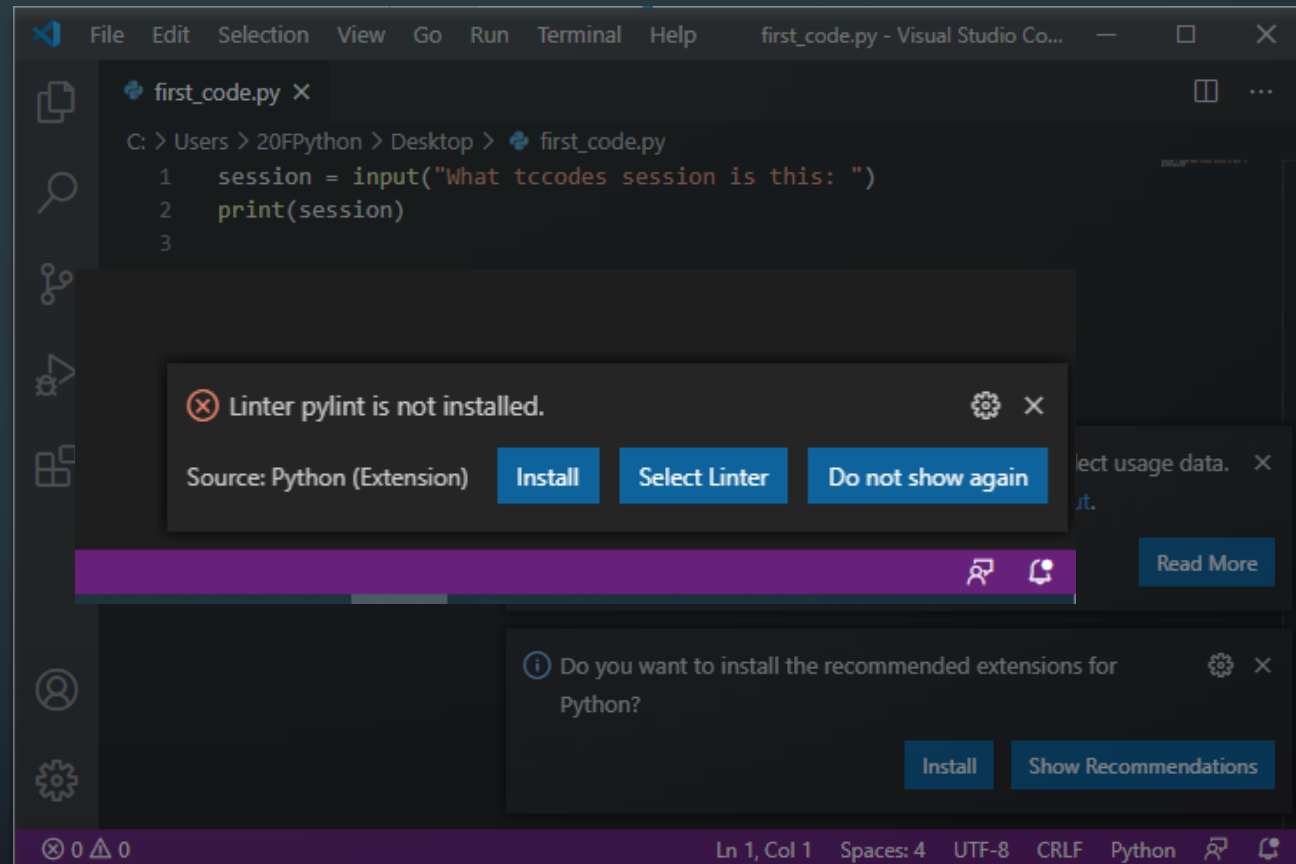
CREATE, EDIT, RUN – PYTHON ON VS CODE



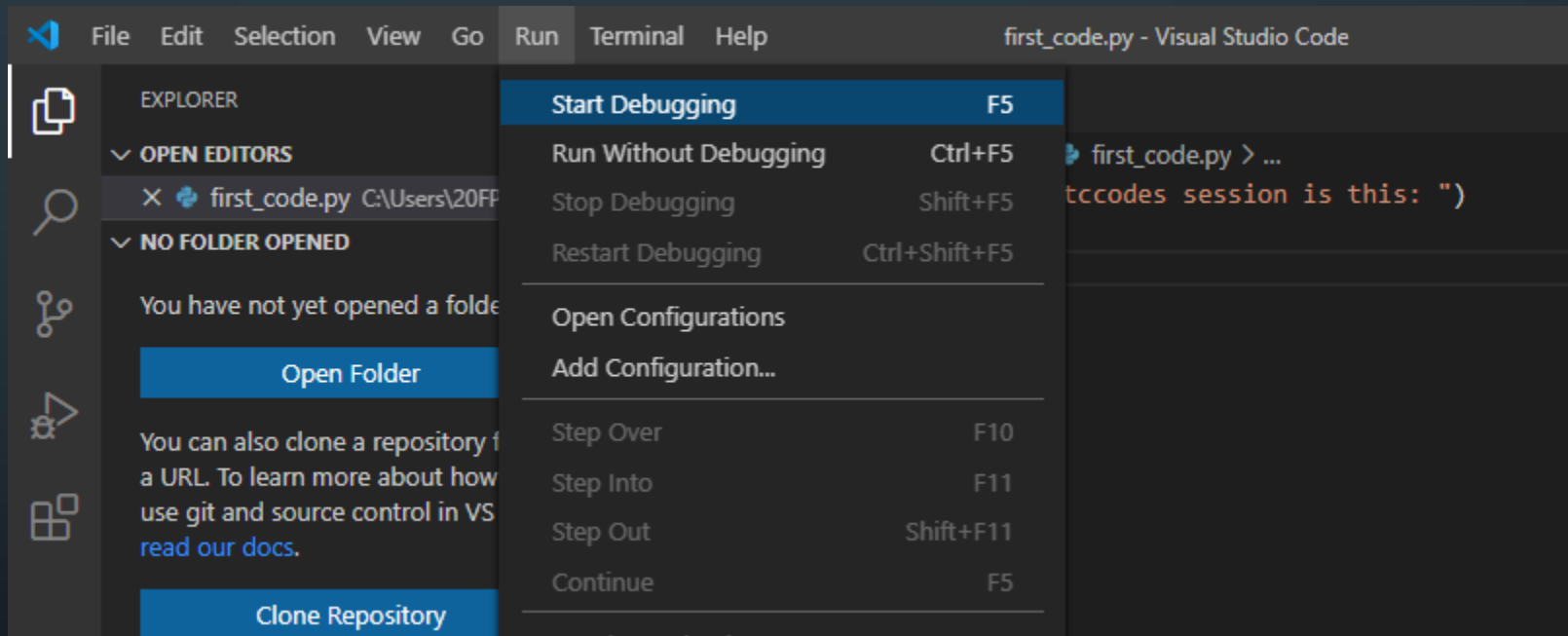
INSTALLING VS CODE EXTENSION FOR PYTHON



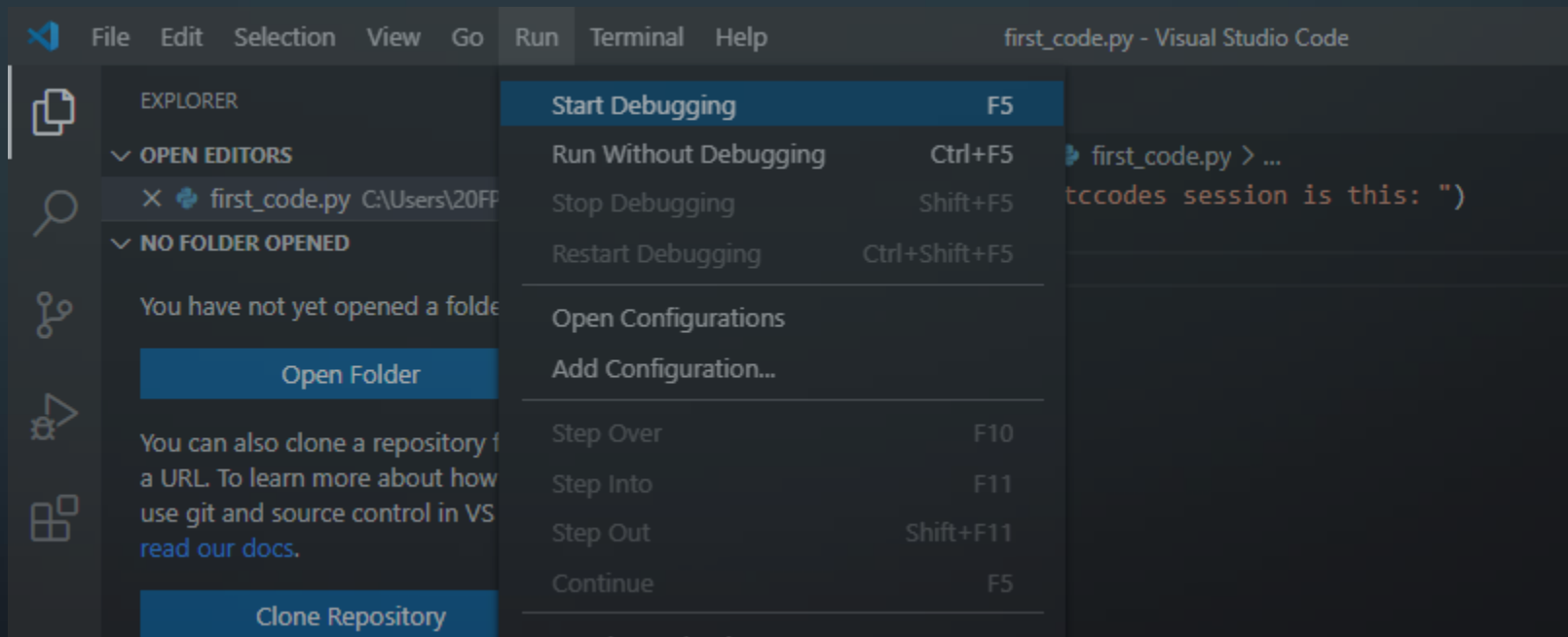
INSTALLING PYTHON LINTER



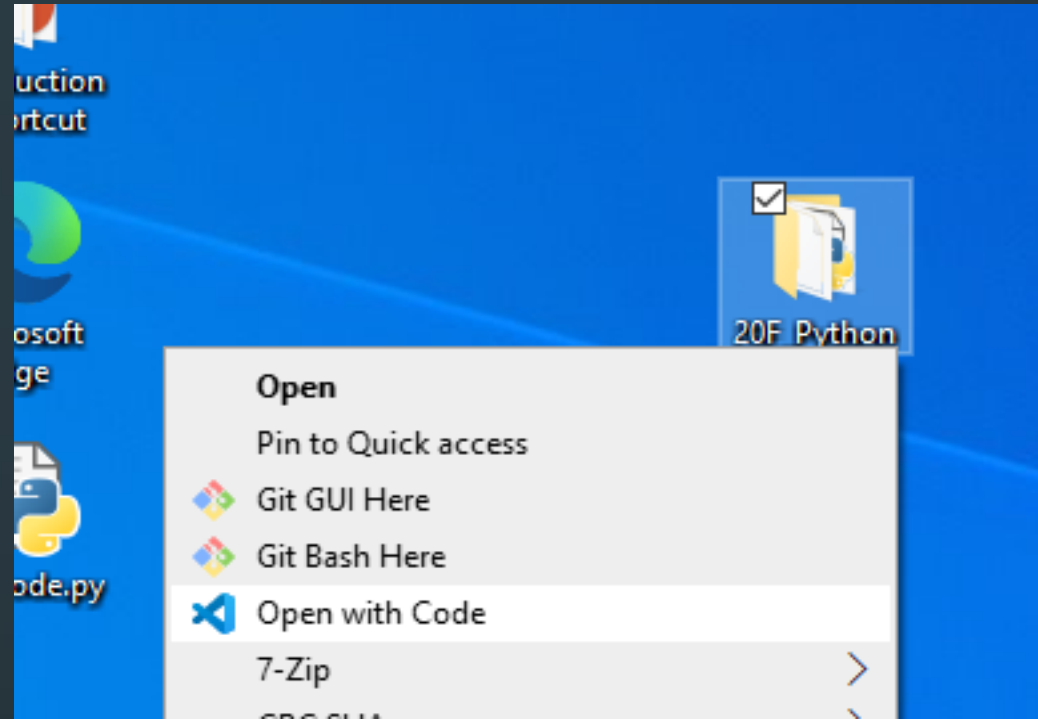
EDIT AND RUN PYTHON IN VS CODE



EDIT AND RUN PYTHON IN VS CODE



PROJECT FOLDERS



PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

2: powershell



Windows PowerShell

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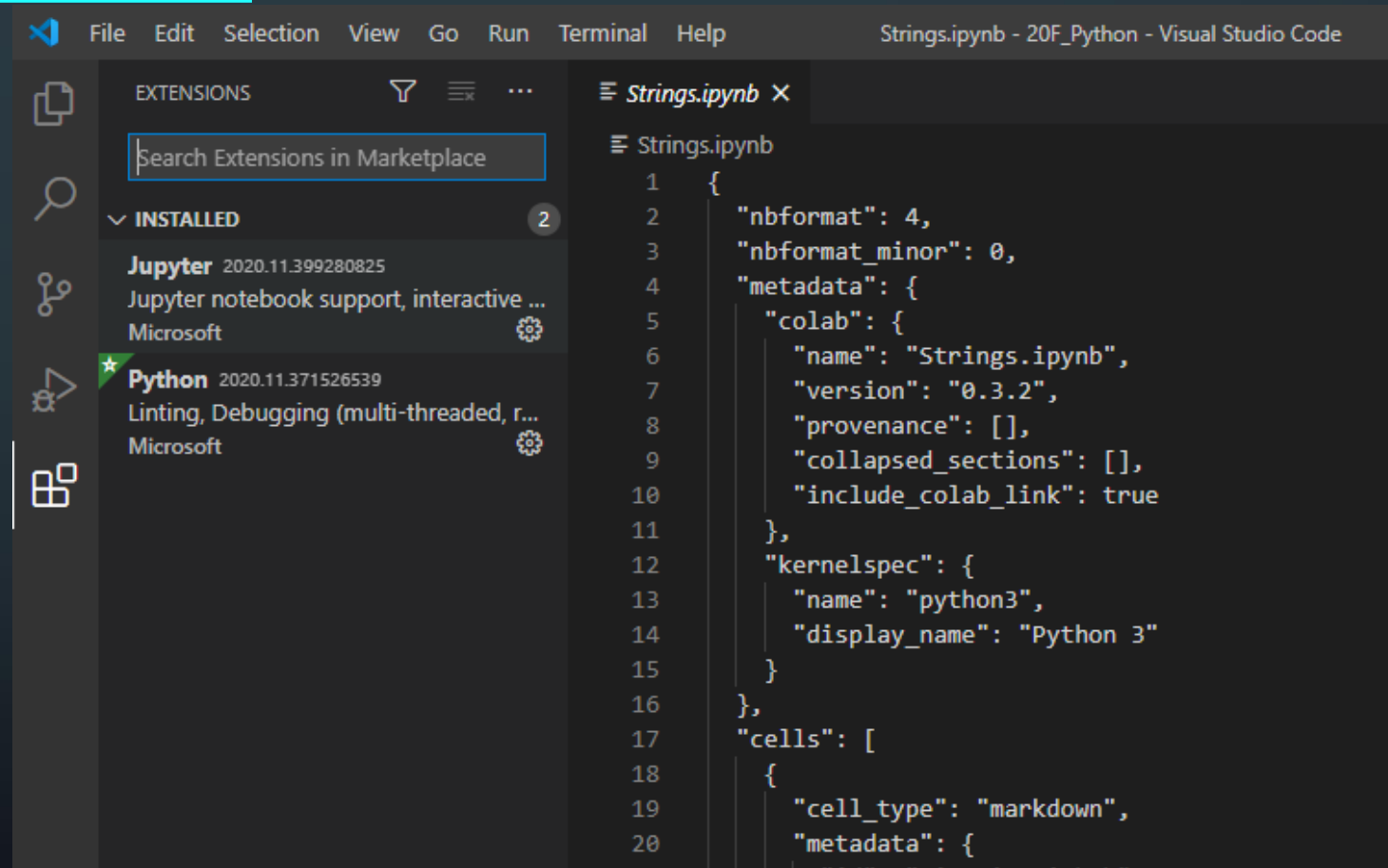
Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\20FPython\Desktop\20F_Python> wget -O guessing_game.py https://bit.ly/K2-p
```

VS CODE – IDE – EDIT AND DEBUG

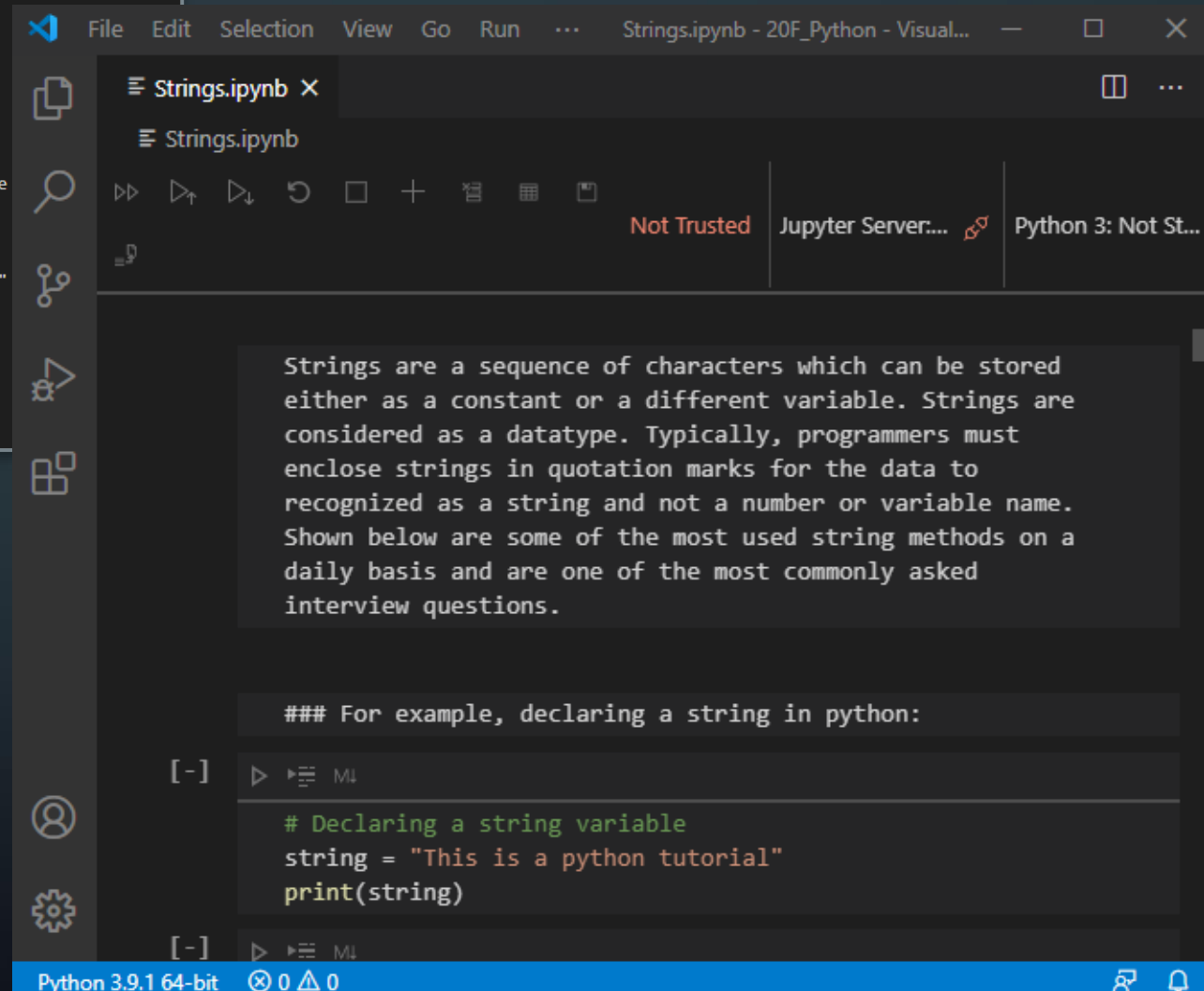
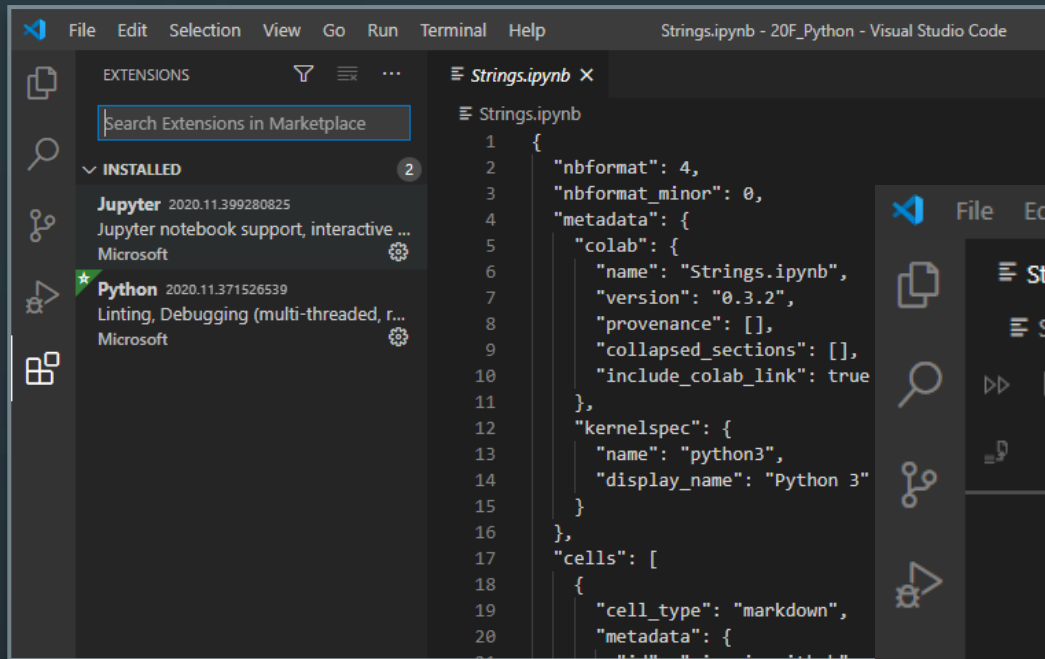
```
wget -O guessing_game.py https://bit.ly/K2-python-guessing-game
```

WORKING WITH JUPYTER NOTEBOOKS IN VISUAL STUDIO CODE



WORKING WITH JUPYTER NOTEBOOKS IN VISUAL STUDIO CODE

- DEMO



VS CODE ON THE RASPBERRY PI

Enable snaps on Debian and install Visual Studio Code



Snaps are applications packaged with all their dependencies to run on all popular Linux distributions from a single build. They update automatically and roll back gracefully.

Snaps are discoverable and installable from the [Snap Store](#), an app store with an audience of millions.

Enable snapd

On Debian 9 (Stretch) and newer, snap can be installed directly from the command line:

```
$ sudo apt update  
sudo apt install snapd  
sudo snap install core
```




Install Visual Studio Code

To install Visual Studio Code, simply use the following command:

```
$ sudo snap install code --classic
```



https://git-scm.com/doc

 --local-branching-on-the-cheap

Search entire site...

About

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Reference

 **Reference Manual**

The official and comprehensive **man pages** that are included in the Git package itself.


 Quick reference guides: [GitHub Cheat Sheet](#) | [Visual Git Cheat Sheet](#)

Book

 **Pro Git**


The entire **Pro Git book** written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

Videos



Git Basics:
What is Version Control?

Episode #1



Git Basics:
What is Git?

Episode #2

GIT AND GITHUB

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

2: powershell



Windows PowerShell

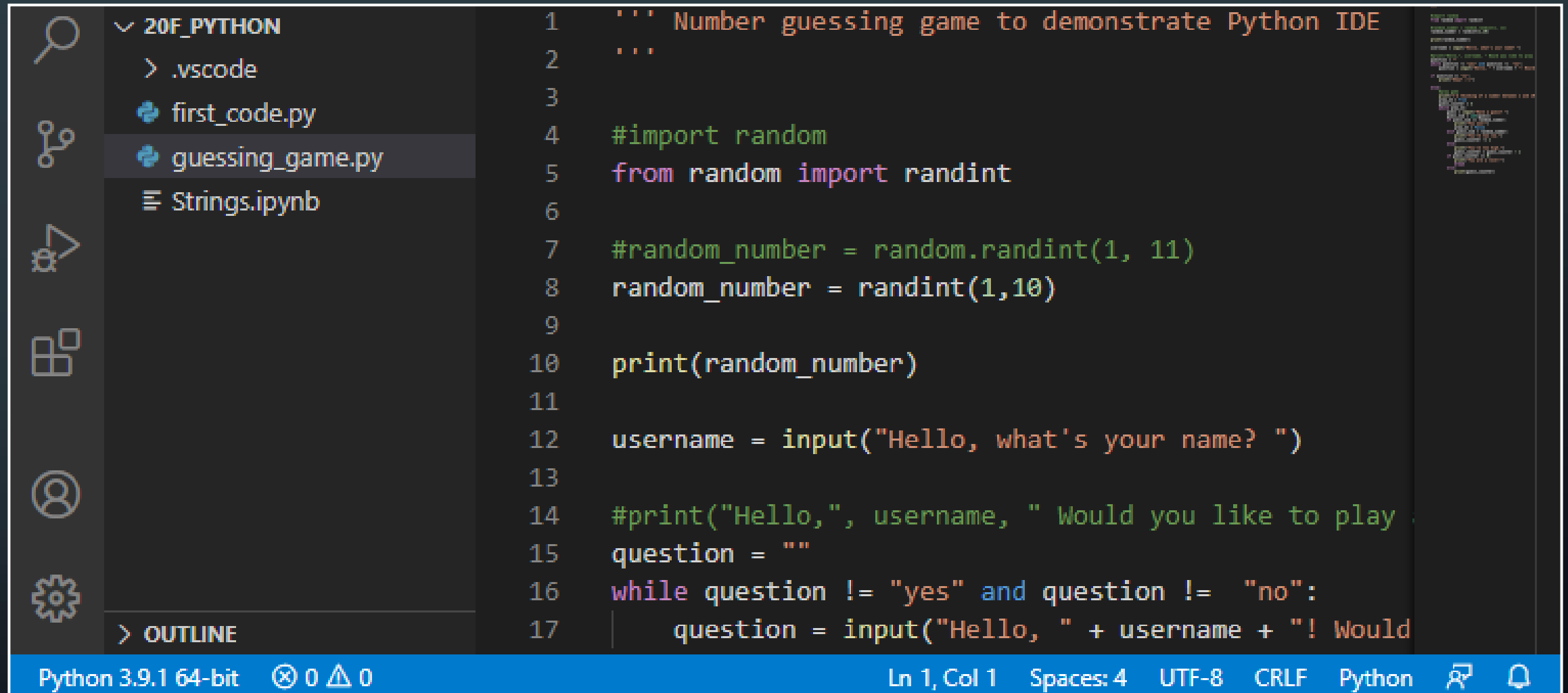
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\20FPython\Desktop\20F_Python> wget -O guessing_game.py https://bit.ly/K2-p
```

VS CODE – IDE – EDIT AND DEBUG

```
wget -O guessing_game.py https://bit.ly/K2-python-guessing-game
```



The image shows a screenshot of the Visual Studio Code (VS Code) editor interface. On the left, the Explorer sidebar is open, showing a project named '20F_PYTHON'. Inside this project, there is a '.vscode' folder and three files: 'first_code.py', 'guessing_game.py' (which is selected and highlighted), and 'Strings.ipynb'. Below the Explorer, the Outline view is collapsed. The main editor area displays the code for 'guessing_game.py'. The code is a Python script for a number guessing game. It starts with a docstring, followed by imports for the 'random' module and 'randint' function. It then generates a random number between 1 and 10, prints it, and prompts the user for their name. Finally, it starts a loop to ask the user if they want to play the game. The status bar at the bottom indicates the Python version is 3.9.1 64-bit, with 0 errors and 0 warnings. It also shows the current cursor position as Line 1, Column 1, and the file encoding as UTF-8 with CRLF line endings.


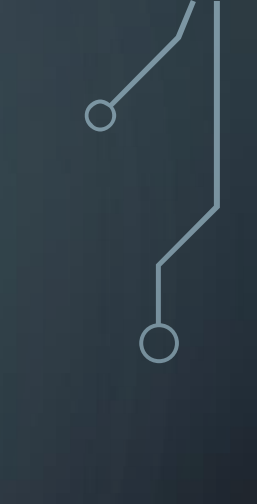
```
1  ''' Number guessing game to demonstrate Python IDE
2  '''
3
4  #import random
5  from random import randint
6
7  #random_number = random.randint(1, 11)
8  random_number = randint(1,10)
9
10 print(random_number)
11
12 username = input("Hello, what's your name? ")
13
14 #print("Hello,", username, " Would you like to play
15 question = ""
16 while question != "yes" and question != "no":
17     question = input("Hello, " + username + "! Would
```

Python 3.9.1 64-bit 0 0 Ln 1, Col 1 Spaces: 4 UTF-8 CRLF Python

GUESSING GAME EXAMPLE IN VS CODE



CPYTHON

- CPython is the reference implementation of the Python programming language. Written in C and Python, CPython is the default and most widely used implementation of the language.
 - CPython can be defined as both an interpreter and a compiler as it compiles Python code into bytecode before interpreting it.
- 
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