

# Programming with Python

## Course Introduction

# So how does one learn how to code?

Think of it like learning a new language

The only way to learn is to try “listen” and “speak” the language



see others code  
study example solutions

write your own codes!

In order to write *Python programs* on our computer, we need the *Spyder IDE* from the *Anaconda distribution*...

# What is Python?

Python is a computer **programming language**. This means, it is a language that you can use to give instructions to your computer.

You can think of your computer as a good friend who follows your instructions, and Python would be the language that you communicate in with him or her.

There are various ways of communication (just as in the “real world”: phone, email, chatting, etc.), some of which are more interactive than others (chatting is more interactive than writing a letter, for example).

Similarly, there are various ways to use the Python language.

# A bit of terminology

**Python:** One (of many other) **programming languages** we will be using. It is the language we will write computer programs in.

**IPython:** A Python **interpreter**. A computer application that provides a convenient and interactive mode for executing Python commands and programs.

**Jupyter:** A **web application** that allows to run IPython in the browser.

**Spyder:** An **integrated development environment (IDE)**. A computer application that includes IPython, a text editor for writing and debugging programs, and more.

**JupyterLab:** An **IDE evolution** of Jupyter notebook.

**PyPlot:** A **module** that provides visualization tools.

**NumPy:** A standard **library** (collection of modules, data types, etc.) that provides numerical arrays and mathematical functions.

**Anaconda:** A Python **distribution**. A single download that conveniently packages all of the above and installs it on your computer.

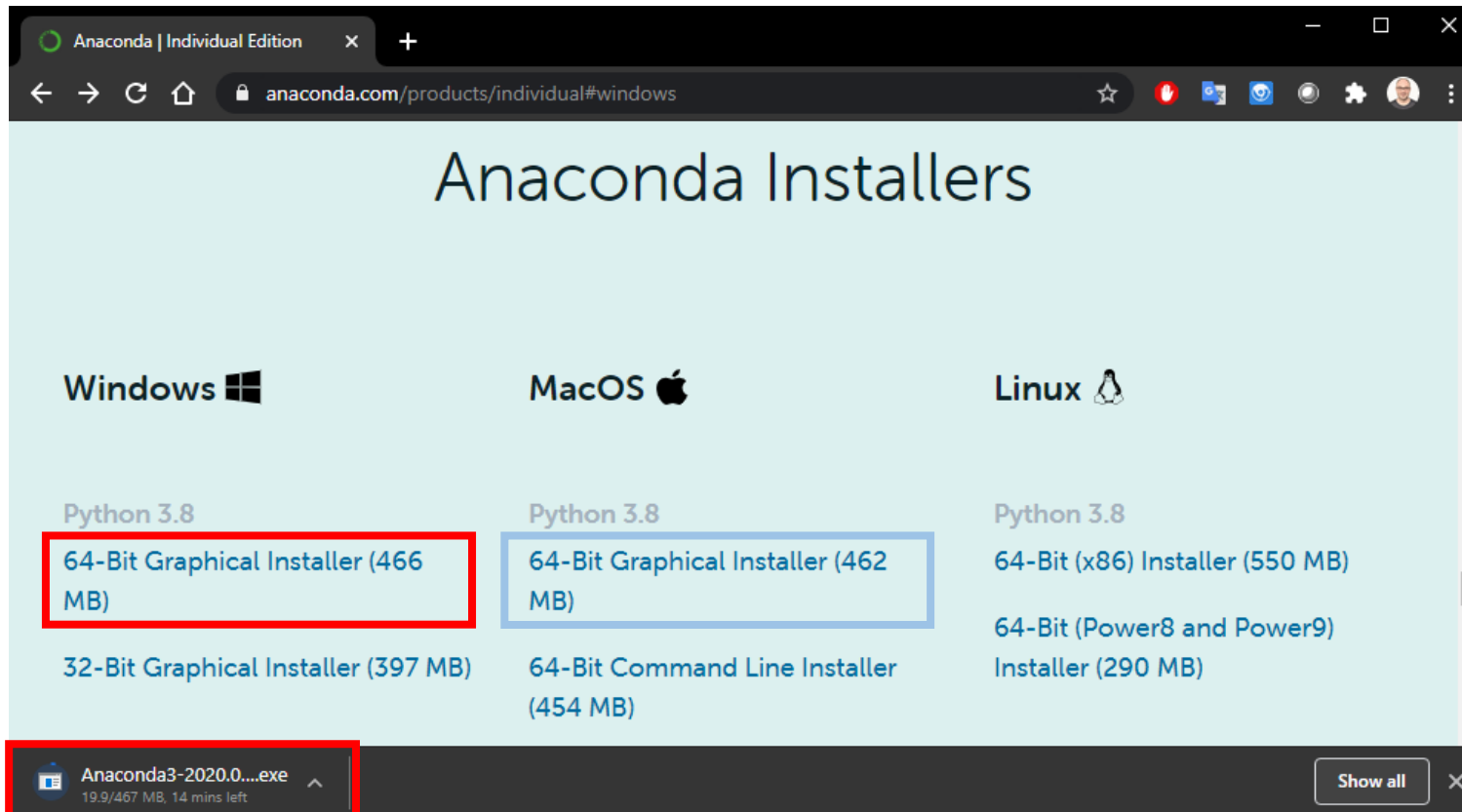
# Install Anaconda

Go to <https://www.anaconda.com/products/individual#Downloads>

Scroll down, click on “64-Bit Graphical Installer” to download

Double-click on .exe file to start installation

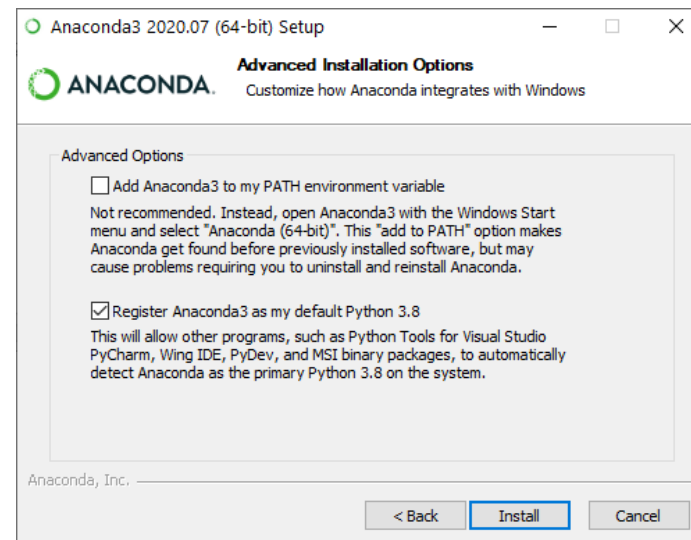
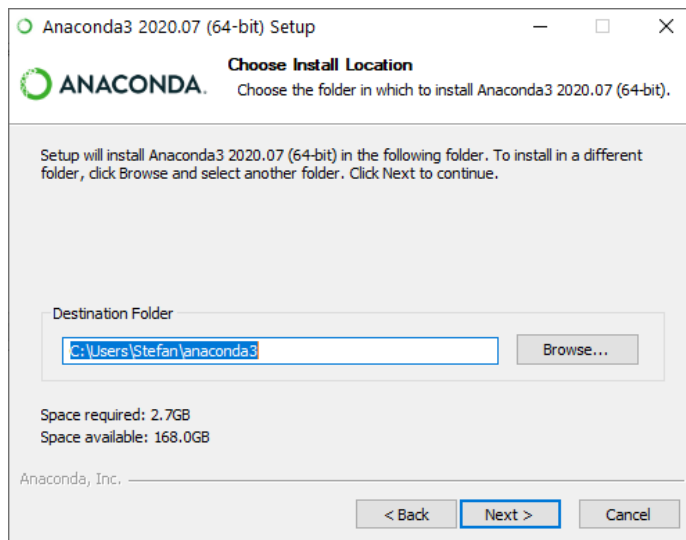
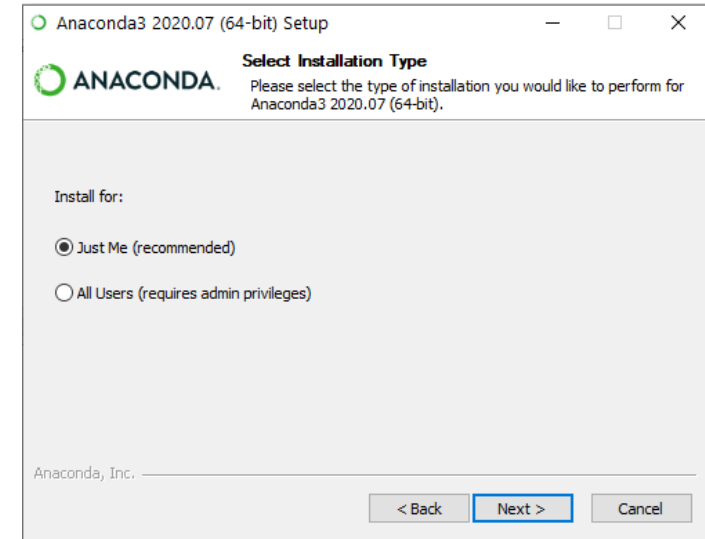
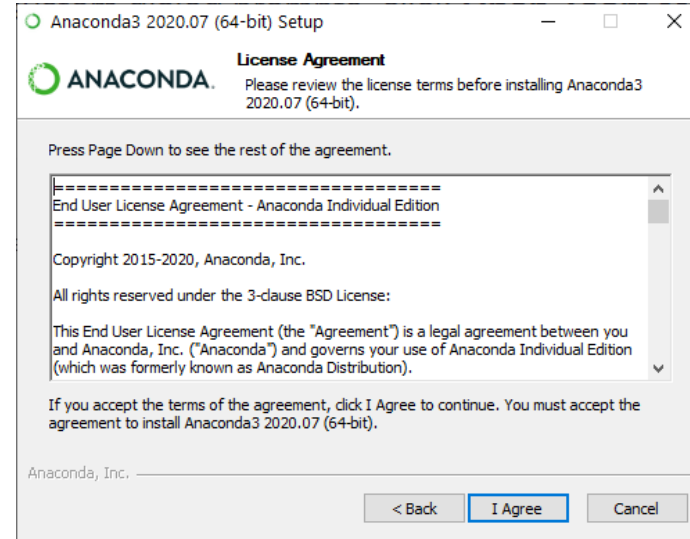
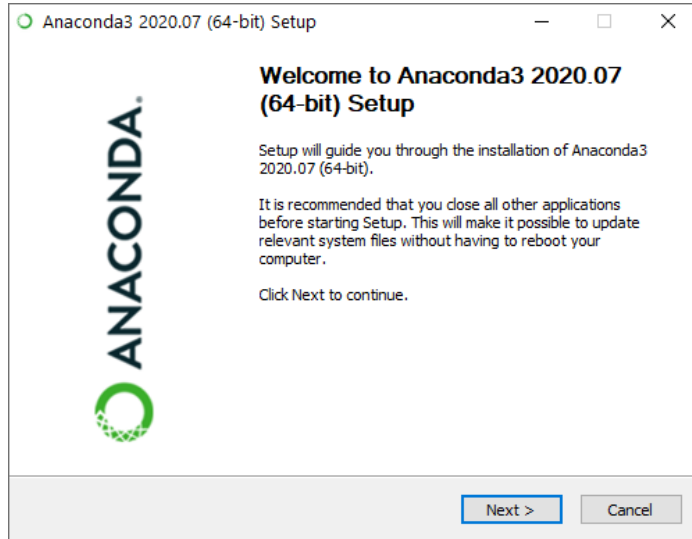
(no need to complete the contact form on the following page)



Installation example shown for a Windows machine  
For Mac, download and install .pkg file instead

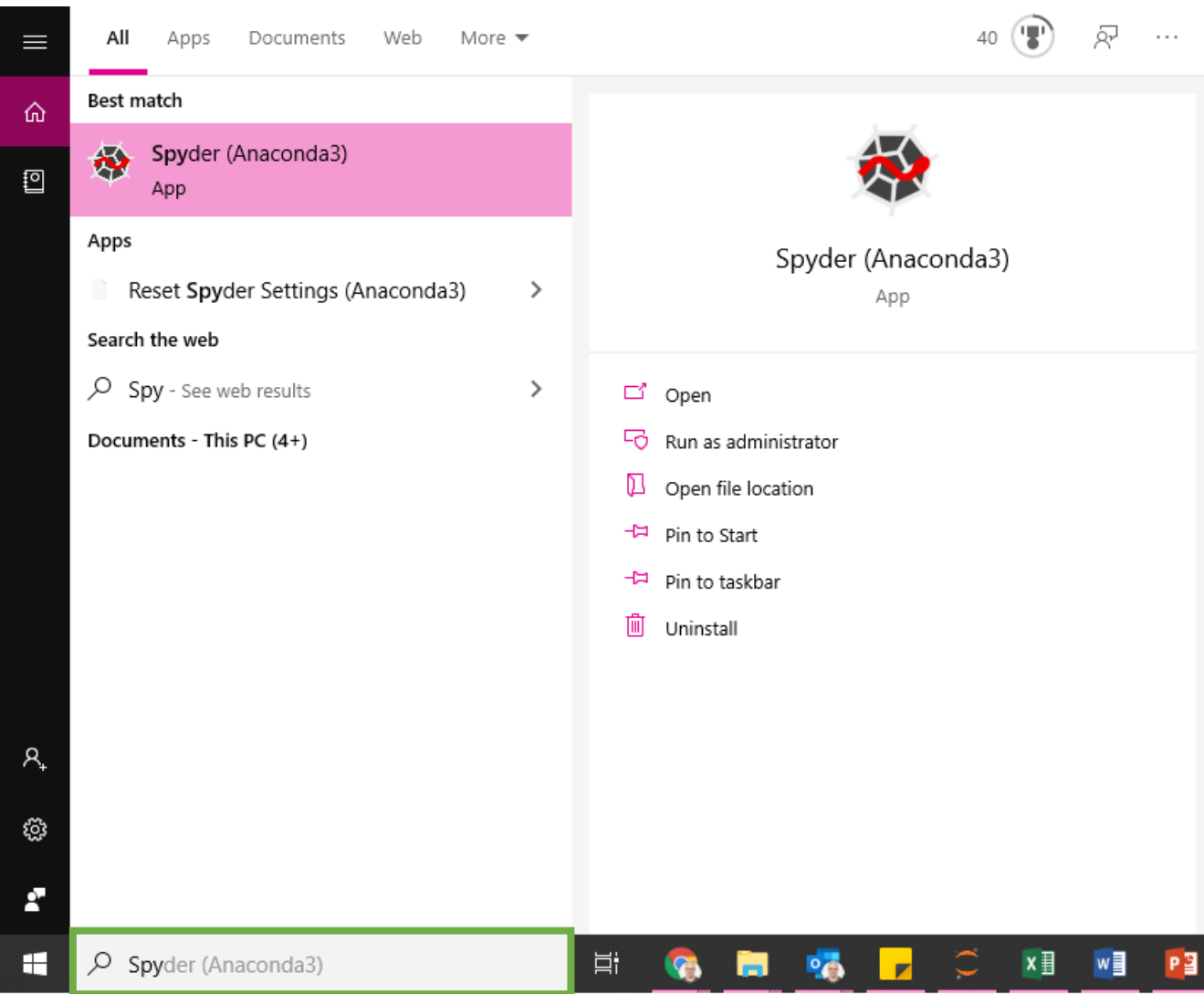
# Install Anaconda ctd.

Click through the following pages, leave all the recommended settings as they are.



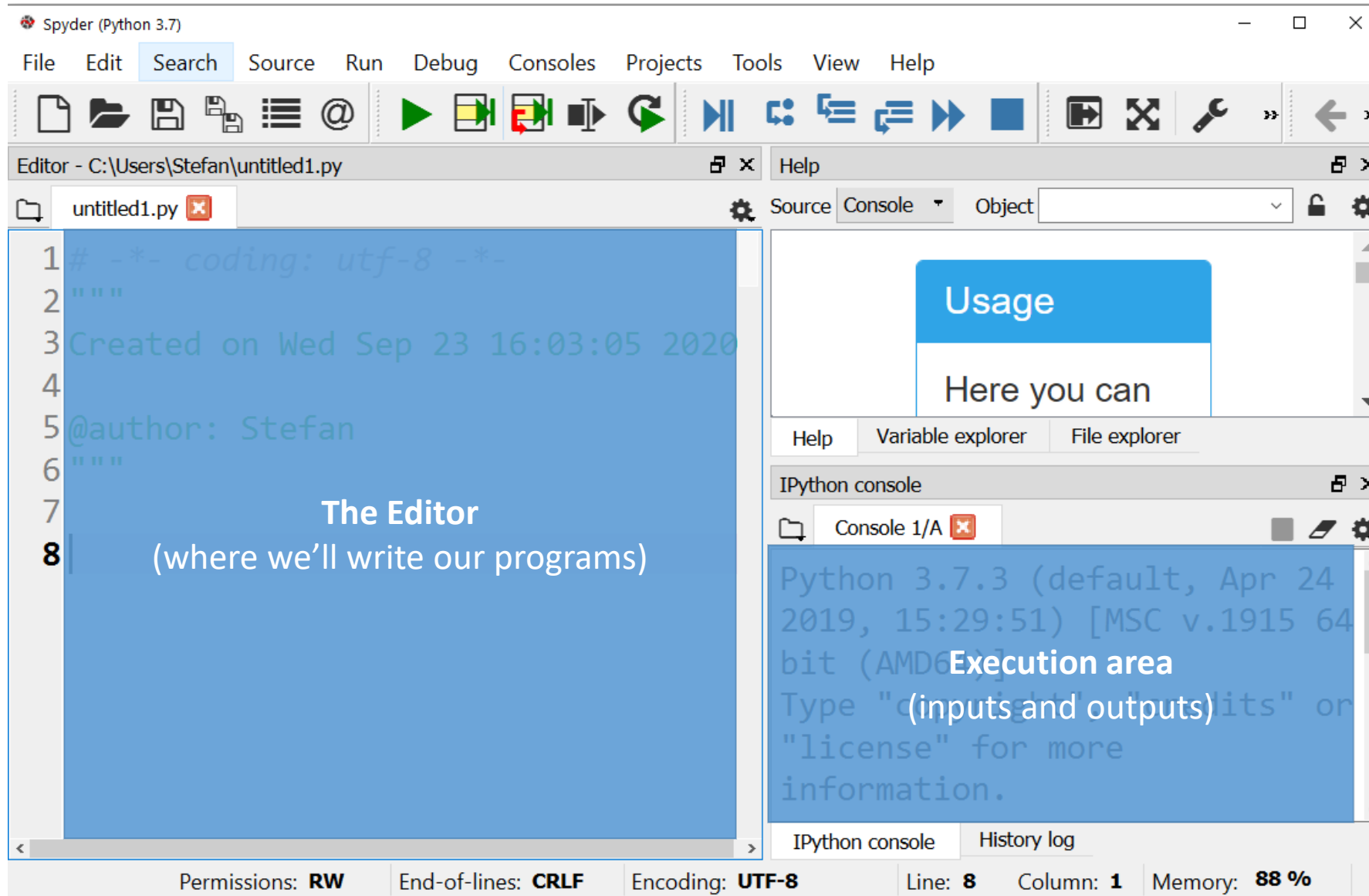
# Start Spyder

After the installation is completed, **type “Spyder”** in the Windows search bar (you might have to accept Firewall access)



# Start Spyder

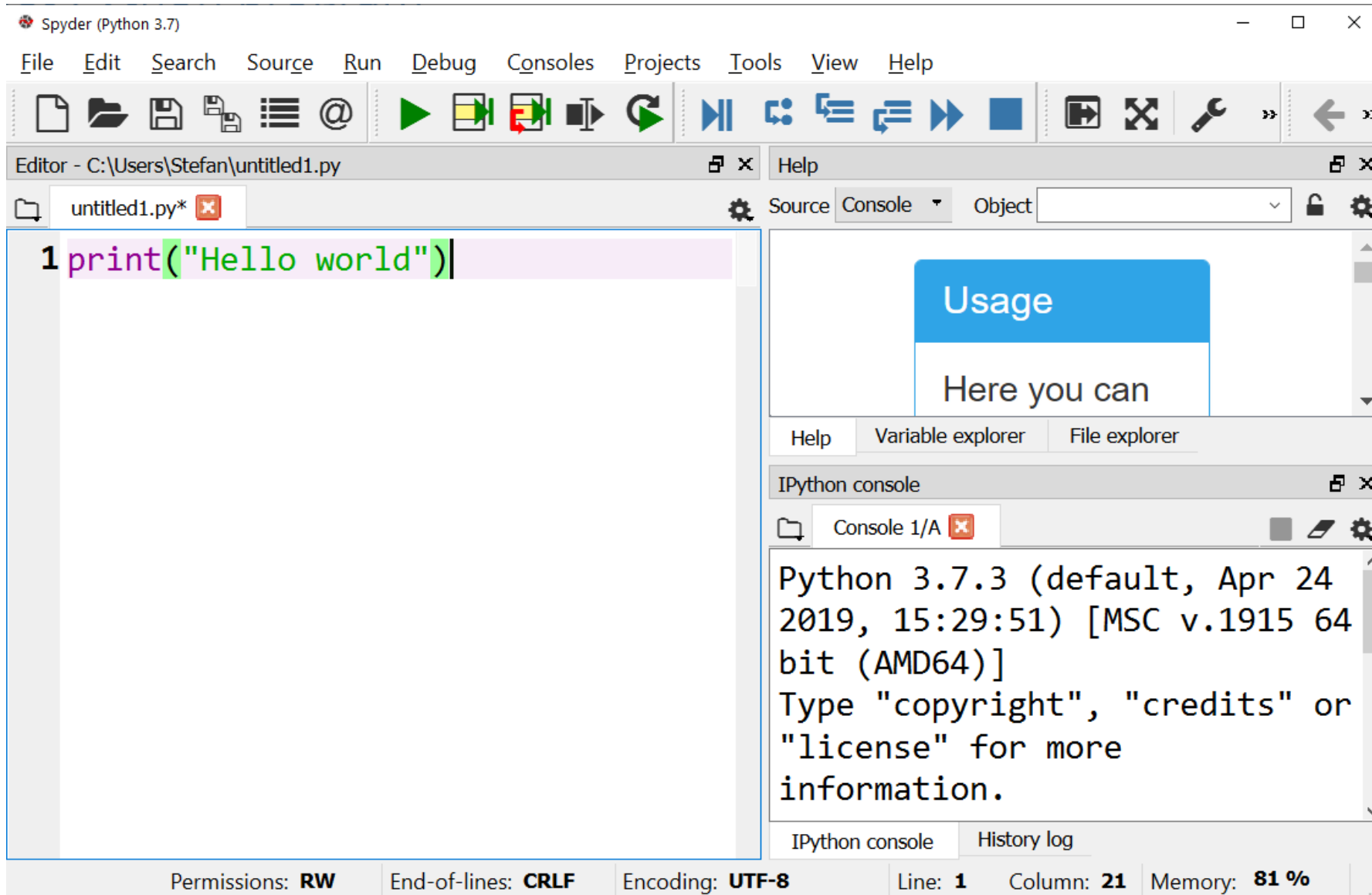
You should see a window similar to the one below. Familiarise yourself with the layout.





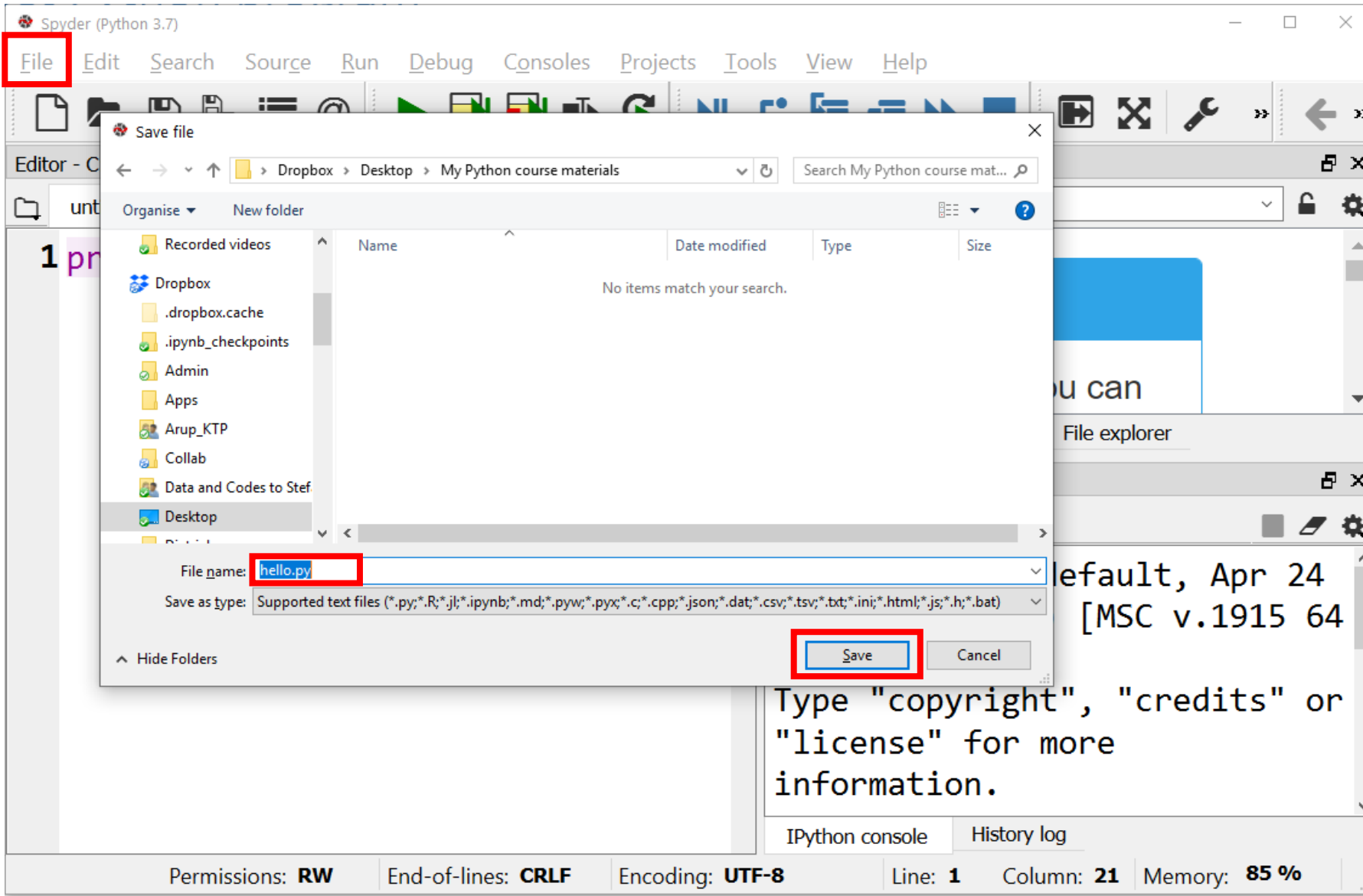
# Your first Python program

Delete the stuff in the editor and type `print("Hello world")`



# Your first Python program ctd.

Go to File and Save as... - create a new folder and save the file as `hello.py`

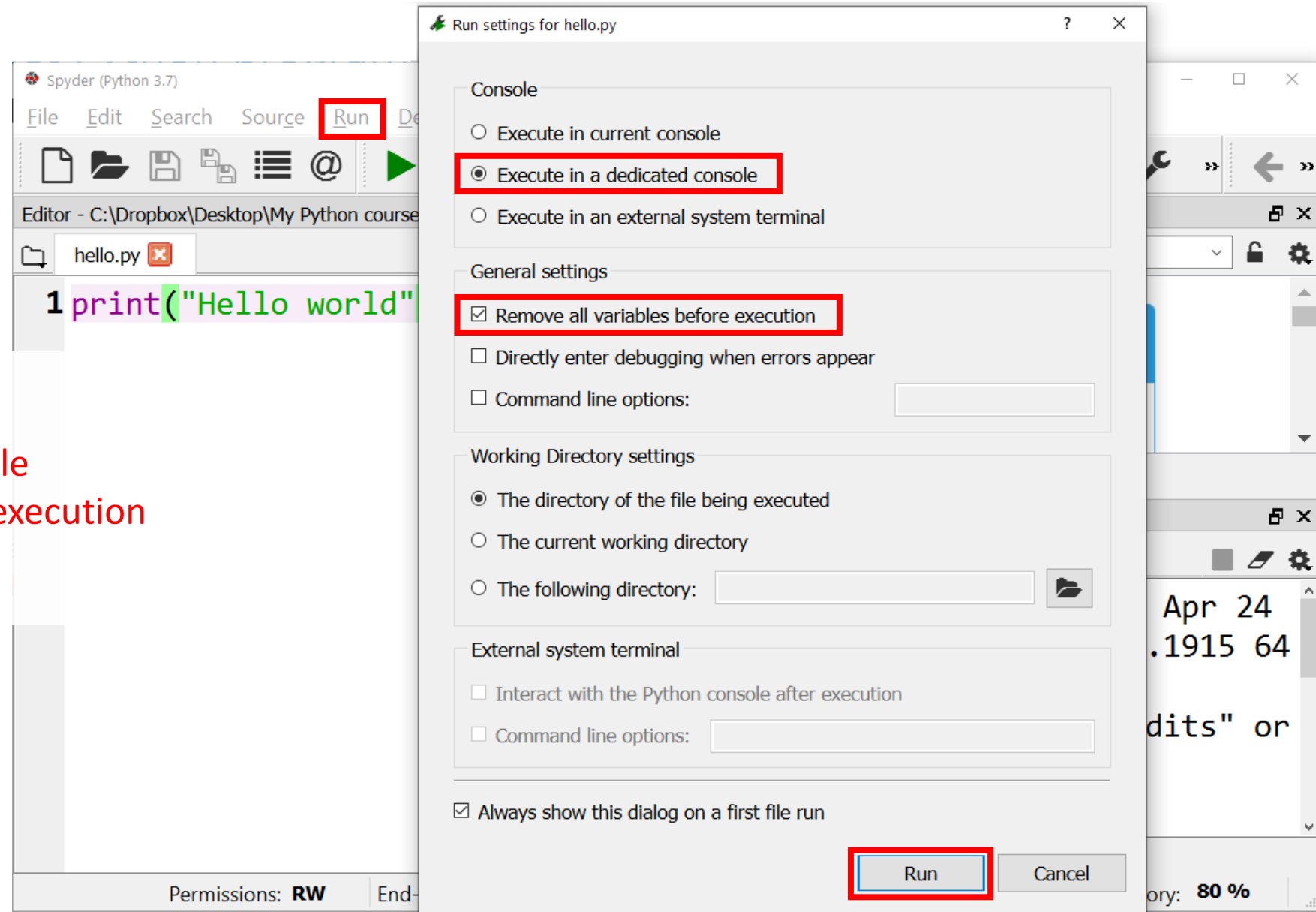


# Your first Python program ctd.

1. Click on Run -> Run (or hit the [F5] key)

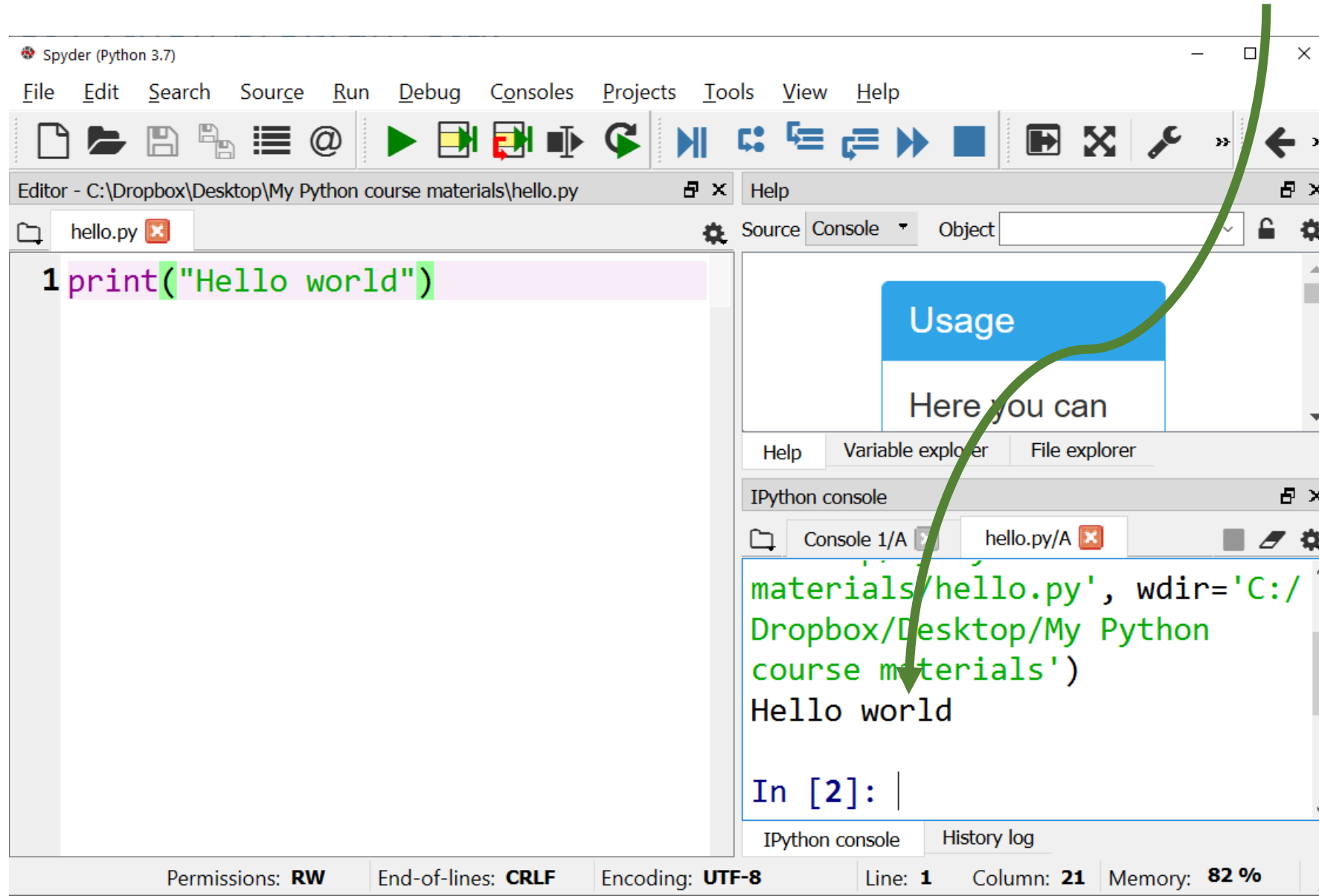
2. Select the options

- Execute in a dedicated console
- Remove all variables before execution and click [Run]



# Your first Python program ctd.

Congratulations! Your first program should have printed something to the console.

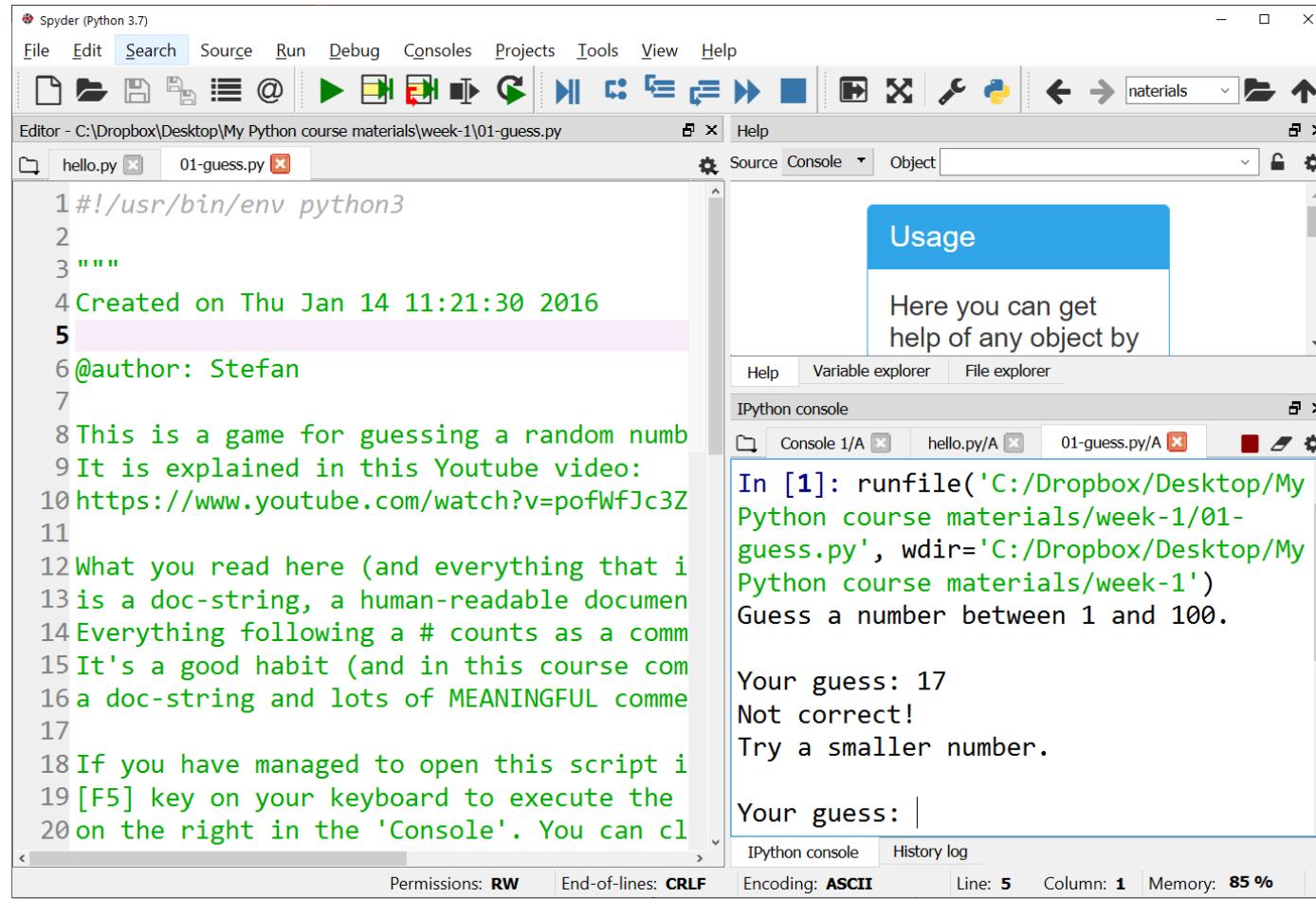


# A more interesting program: number guessing

Download the 01-guess.py file from the course website

Ideally, move it to a new “week-1” folder for all your codes (be organised from the start!)

Open the file in Spyder, run it, play with it, read the code, understand it? Modify?



The screenshot shows the Spyder Python IDE interface. The editor window displays the 01-guess.py file with the following code:

```
1#!/usr/bin/env python3
2
3"""
4Created on Thu Jan 14 11:21:30 2016
5
6@author: Stefan
7
8This is a game for guessing a random numb
9It is explained in this Youtube video:
10https://www.youtube.com/watch?v=pofWfJc3Z
11
12What you read here (and everything that i
13is a doc-string, a human-readable documen
14Everything following a # counts as a comm
15It's a good habit (and in this course com
16a doc-string and lots of MEANINGFUL comme
17
18If you have managed to open this script i
19[F5] key on your keyboard to execute the
20on the right in the 'Console'. You can cl
```

The IPython console shows the execution of the script:

```
In [1]: runfile('C:/Dropbox/Desktop/My Python course materials/week-1/01-guess.py', wdir='C:/Dropbox/Desktop/My Python course materials/week-1')
Guess a number between 1 and 100.

Your guess: 17
Not correct!
Try a smaller number.

Your guess: |
```

The status bar at the bottom indicates: Permissions: RW, End-of-lines: CRLF, Encoding: ASCII, Line: 5, Column: 1, Memory: 85 %.

Don't be afraid to modify the code.  
It's likely you will break it!  
But your computer won't break.  
Try fix the code again.  
And again.  
Until it works.  
That's the only way to become a programmer ☺

Refer to:

<https://www.youtube.com/watch?v=pofWfJc3Zog>

# What if the Anaconda installation fails on my own computer?

Unfortunately, **we do not have capacity to provide individual IT support. But:**

- If possible, reinstall or try the installation on another computer
- Sign up on <https://repl.it/> and create Python 3 “repls”

This is a very convenient browser-based Python editor, including program execution

It will be sufficient for (almost) all of our course

