

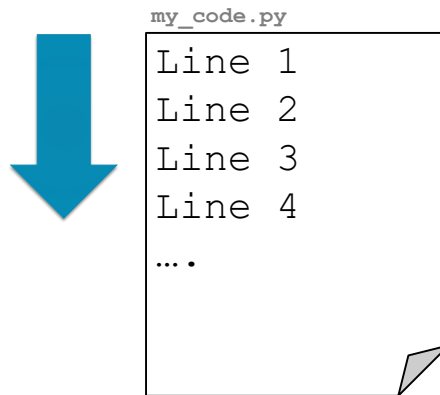
# EXECUTION

An Introduction to Computer Science



Let's learn about Executing Programs.

## Executing a Program



Once a program is written, it can be executed.

This means that the computer will read the text of the program line by line, and perform each step.

## Terminology

- "Run"
- "Executed"

Although it may sound like a synonym, to "kill" a program means to end it (the opposite of "executing" it!)



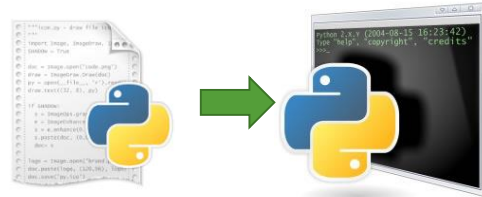
We say that a program is "Run" or "Executed".

# Python

## Programming Language

1. "Each statement should..."
2. "You cannot begin a variable with..."
3. "Defining a function requires ..."
4. ...

## Program

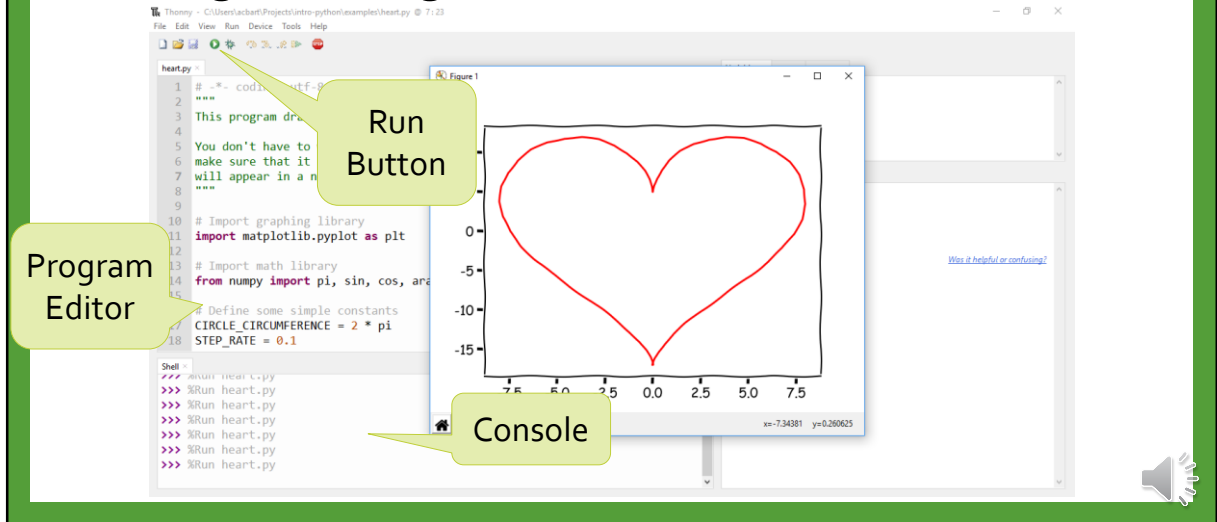


Python is two things:

First, as a programming language it is a set of rules for writing Python programs.

Second, it is a program that can execute programs written in the Python programming language.

# Programming Environments

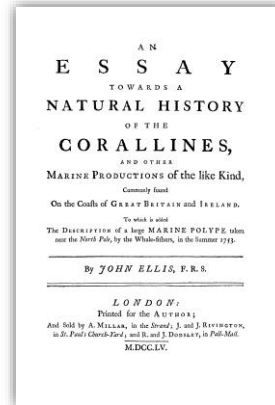


Technically, you can write programs in a text editor and then run them with Python separately.

However, most programmers use a Programming Environment that makes it very easy to write programs and then press a single button to run them.

# Programs are Text

```
1 #- coding: utf-8 -*-
2 """
3 Created on Thu Oct 27 12:15:12 2016
4
5 @author: acbart
6 """
7
8 import matplotlib.pyplot as plt
9 import numpy as np
10 from matplotlib.collections import LineCollection
11 from matplotlib.colors import ListedColormap, BoundaryNorm
12
13 # Create a colormap for red, green and blue and a norm to color
14 # f' < -0.5 red, f' > 0.5 blue, and the rest green
15 cmap = ListedColormap(['r', 'b'])
16 norm = BoundaryNorm([-1, -0.5, 0.5, 1], cmap.N)
17
18 plt.kkcd()
19
20 t = np.arange(0, 2*np.pi, 0.1)
21 x = 16*np.sin(t)**3
22 y = 13*np.cos(t)-5*np.cos(2*t)-2*np.cos(3*t)-np.cos(4*t)
23 plt.plot(x, y, c='r')
24 plt.show()
```



When you write a Python program, you are really just writing some text.  
That text needs to be valid Python text, following all of its syntax rules.  
But that means it's not that different from an essay you might write in English.