MATPLOTLIB

What is matplotlib?

- Drawing tool
- Plotting graphs of functions
- Plotting images produced by your code

Main components of matplotlib

- The plot (matplotlib.pyplot)
- The figure (which is drawn on the plot)
- The window
- The actual things being drawn
  - A graph
  - An image
  - etc...

How to use matplotlib?

1. **First step:** Import the library

```
import matplotlib.pyplot as plt
```

(plt is a conventional name for pyplot)

2. **Second step:** Get the data you need to plot. Here it's a quadratic function:

```
x_range = range(-200,200)
y_range = map(lambda x: x*x, x_range)
```

Now that we have the data, we can actually start plotting it

3. **Third step:** Plot the data using the plt object that we created (draw the figure)

```
plt.plot(x_range, y_range)
```

4. **Fourth step:** See the figure

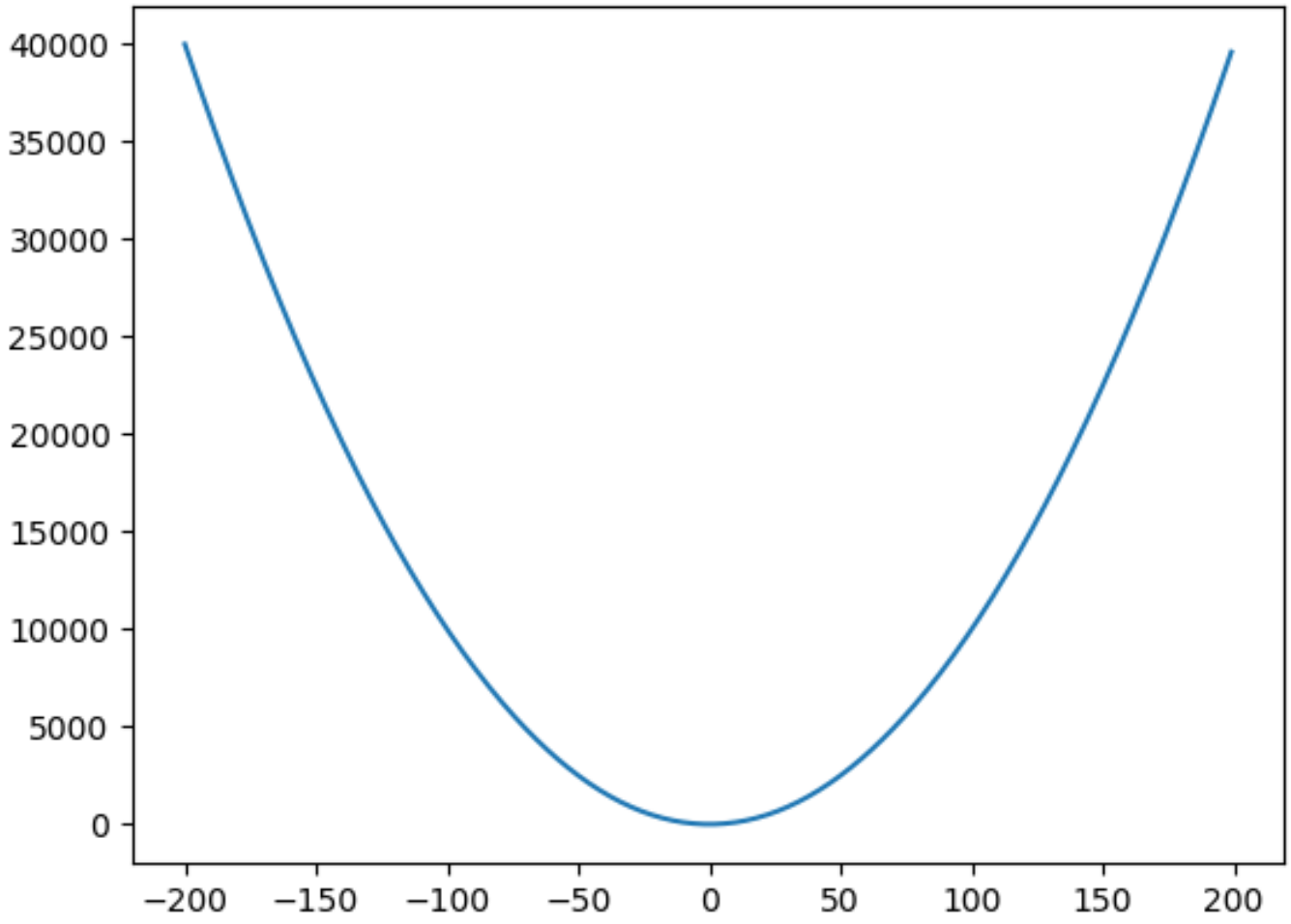
```
plt.show()
```

5. **Optional:** Save the figure into an image file

```
plt.savefig("image.png")
```

This is the basic process that can at each step be modified to need.

The result


40000
35000
30000
25000
20000
15000
10000
5000
0
−200
−150
−100
−50
0
50
100
150
200

Drawing images

Images can be drawn using a list of lists of pixels structured as follows:

- Image: list of rows
- Row: list of pixels

Pixel format:

```
pixel = 5 # some color from the color palette
pixel = (23, 244, 52) # RGB code for the color
```

Example: The fractal image generator