Homework01

Computational Physics

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1 Homework

1. If we define the point is a good point when the iterations exceed 100, and I set the coarse grid value N is 400, I can get the following image of the Mandelbrot set with black and white:

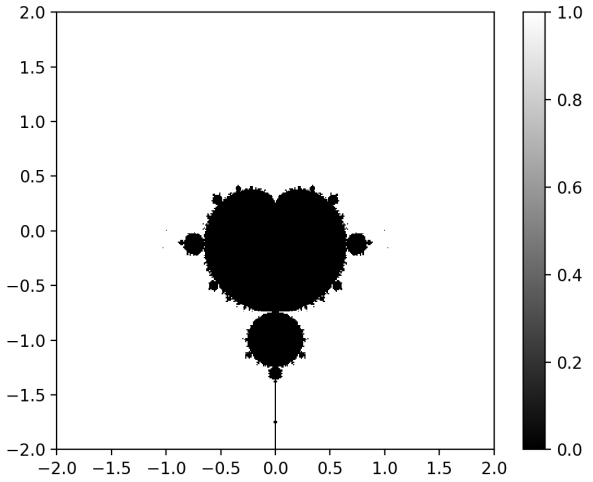

Figure 1.1: The Mandelbrot Set in black and white

Then, if I increase the maximum iteration number to 400, and plot the number of iterations with "jet" schemes, I can get the following figure:

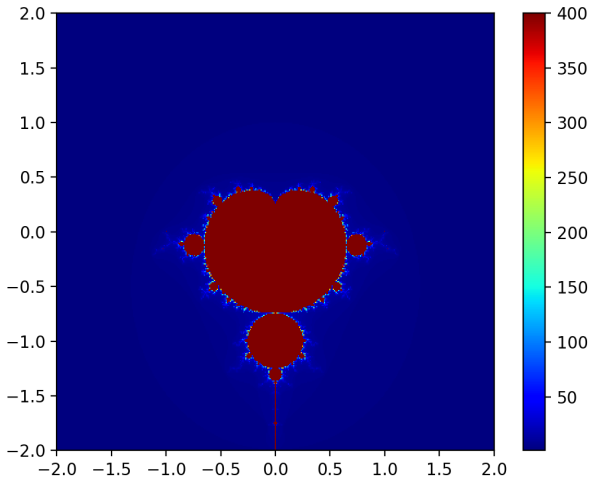

Figure 1.2: The Mandelbrot Set (Iteration Number) using "jet" schemes.

2. For problem (a), (b), and (c), I can get the final figure with the data and a straight. And the fitting

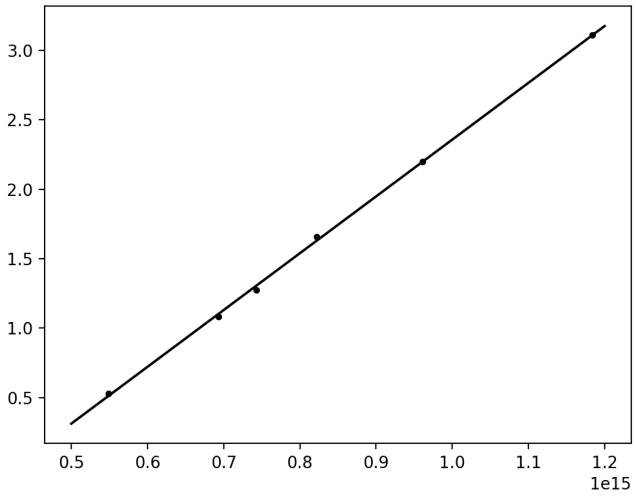

Figure 1.3: The Millikan's data points and the best-fit line.

quantities:

$$\begin{aligned} E_x &= 8.25 \times 10^{14},\ E_y = 1.64 \\ E_{xx} &= 7.22 \times 10^{29},\ E_{xy} = 1.52 \times 10^{15} \\ m &= 4.09 \times 10^{-15},\ c = -1.73 \end{aligned} \tag{1.1}$$

The calculated Planck's constant from Millikan's experimental is:

$$h = m \times e = 6.54934022835 \times 10^{-34} \tag{1.2}$$

And the accepted value (from *Wikipedia*) is $h = 6.626176 \times 10^{-34}$