

# Digital Image Processing

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## 1 Introduction

All of the programs are written in python 3. The shebangs are included and thus they should work if called using the `"./program.py"` notation. In case this causes a problem, please try to call them using `"python3 program.py"` notation.

I will provide further help on how to call each program.

### 1.1 libraries

I used numpy in all of the programs and scipy in some of them. I will detail when scipy is used.

## 2 Exercise 1

The program called `ex1.py` computes the histogram of a greyscale image, and enhances the image using histogram equalization. it displays the enhanced image, the histograms of the default and enhanced images, and the transformation function.

### 2.1 Examples

#### 2.1.1 Fig1.jpg

All of the results are obtained using the program with the call `"./ex1.py Fig1.jpg"`



Figure 1: Original image

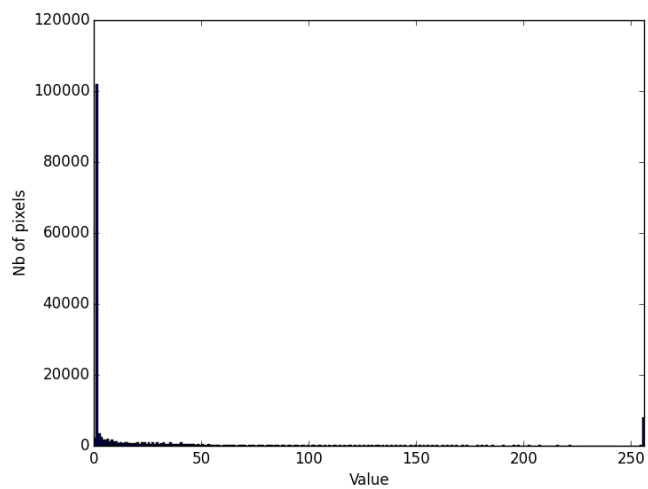


Figure 2: Original image's histogram

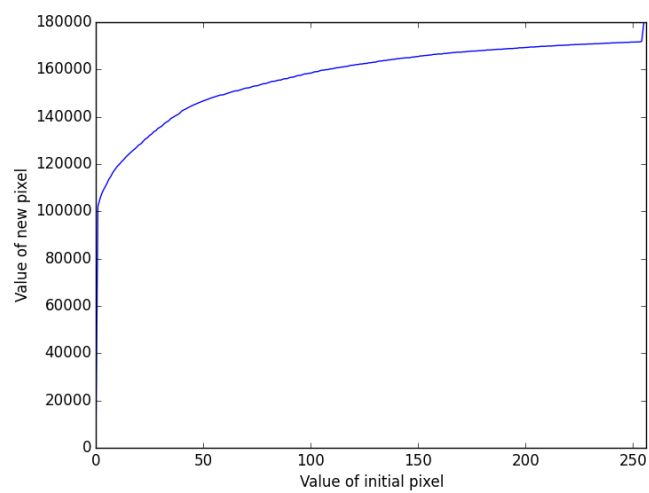


Figure 3: Enhancement function

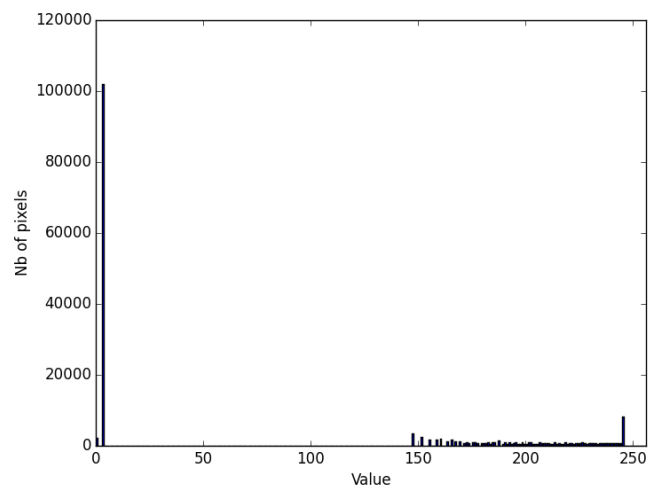


Figure 4: Enhanced image histogram



Figure 5: Enhanced image

### 2.1.2 Fig2.jpg

All of the results are obtained using the program with the call `./ex1.py Fig2.jpg`



Figure 6: Original image

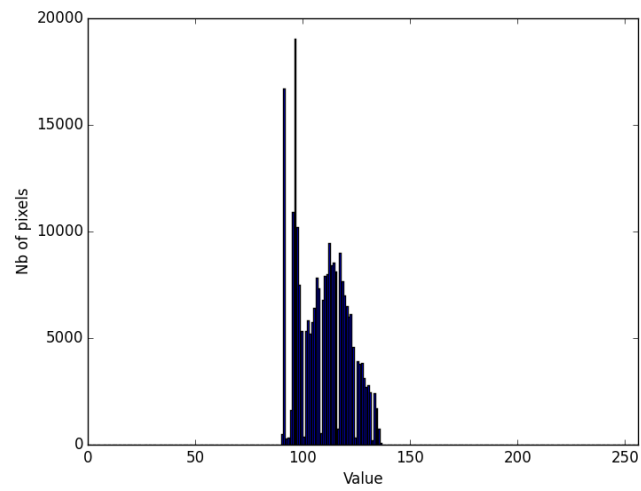


Figure 7: Original image's histogram

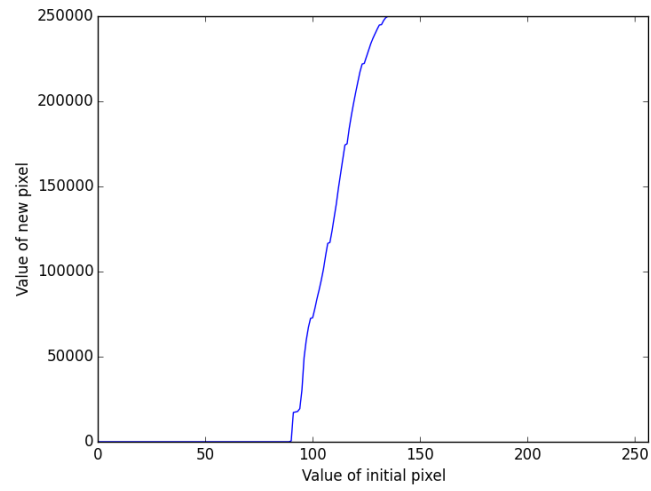


Figure 8: Enhancement function

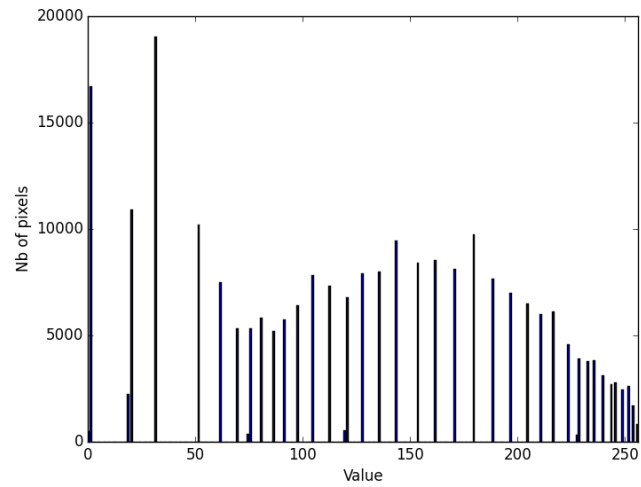


Figure 9: Enhanced image histogram

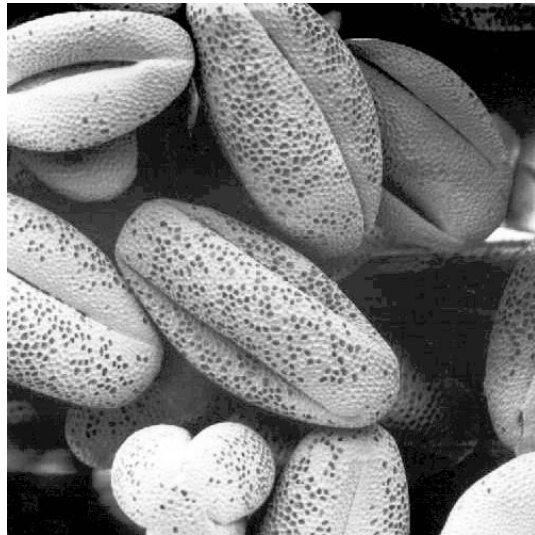


Figure 10: Enhanced image

### 3 Exercise 2