Documentation for the `cmp.py` script

1 Introduction

The program in this project is written in the open source programming language Python, using the standard library, along with the NumPy and Matplotlib packages, with PyQt5 being used for the GUI. The versions used in development was

- Python 3.6.5
- NumPy 1.14.3
- Matplotlib 2.2.2
- PyQt 5.9.2

The program should work with newer versions, though maybe not if they are major updates (where a package changes its leftmost version number). You can find instructions on how to install the different packages on their respective websites.

It is however recommended that you install Anaconda, which is a Python distribution that also includes both NumPy, Matplotlib and PyQt5, along with a wealth of other packages useful for scientific computing. The Jupyter package, especially, is useful, as it allows the user to write a bunch of small scripts (called cells) in a single file (called a notebook), and run the cells individually and quickly, while sharing the workspace between cells (i.e., variables persist between cells). A quick intro to Jupyter notebooks can be found at this link.

2 Installation

As recommended we will install the Anaconda distribution. Download and install the software, and when asked if you want to include Anaconda to the path (or something along those lines) say: "Yes". This will allow you to start Python from your command line/terminal with the command `python`.

Next you will need the files `cmp.py`, `lattices.py`, `gui.py` and `notebook.ipynb`, which can be found on the course page, or at the following GitHub page.

3 Usage

There are two main ways of starting the program. Either directly from the command line or from a Jupyter Notebook. Using the command line:

- Start the terminal/command line
- navigate to the directory where you downloaded the files to.
- type `python cmp.py` and press return.

or using Jupyter Notebooks:

- Start Jupyter Notebooks. Either by opening the terminal/command line and typing `jupyter notebook`, or by opening the program `anaconda-navigator`, installed with Anaconda, and then launch Jupyter Notebooks from there

- A browser window should have appeared. Navigate to the directory where you downloaded the files to and open the file `notebook.ipynb`.
- in the open cell type `run cmp.py` and press ctrl+return to run the cell.