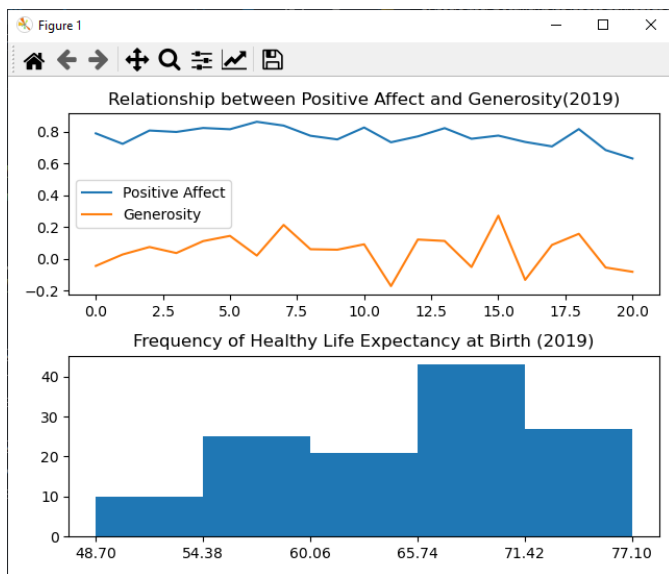


CS115 Introduction to Programming with Python

Lab Guide 09

Objectives: Numpy, data visualization with matplotlib.

1. The following files contain information about countries and indicator data about their happiness for several years. Download the csv (comma-separated values) files 'world-happiness-report_country.csv' and 'world-happiness-report_data.csv'. The country file contains the names of the countries whose data is represented in the data file. The column headings in the data file describe the data stored in each column (open file with Excel, Notepad++, etc.).
2. Create a Python script that does the following:
 - a. Import the country names into a numpy array (string data). Use `np.loadtxt()`.
 - b. Import the indicator data into a two-dimensional numpy array (float data). Use `np.loadtxt()`.
 - c. Extract the data for 2019 from the indicator array, and the corresponding country names from the country array.
 - d. Create a new array, `increased`, which increases the healthy life expectancy for 2019 by 10%.
 - e. Create a two-dimensional array where the first column contains the country names, and the second column contains the increased healthy life expectancy data.
 - f. Output the two-dimensional array from question e to a file, `increased_data.txt`.
 - g. Using the data from the 2019 arrays, create the following figures:



h.

