# Week 5 Exercise – NumPy Arrays and matplotlib Plotting

## Before attempting either part of this Week 5 exercise, be sure you have completed (and studied) the Python Tutorials. Include all relevant code and visualizations/plots.

## Do not forgot to thoroughly comment your code.

## Part A: looping\_arrays.py

Exercise on Looping three dimensional numpy arrays

A.1. Read, study and execute looping\_arrays.py

#numpy import only needed if not imported already:

import numpy as np

arr3 = np.array([[[1, 2, 3], [4, 5, 6]], [[7, 8, 9], [10, 11, 12]]])

print(arr3)

print(np.shape(arr3))

A.2. Within a single statement, create three nested loops to access all elements of the three-dimensional array arr3

Cut and paste your python code below:



## Part B: matplotlib Plotting

In Part B, you will use two datafiles (attached here):

* gapminder\_gdp\_asia.csv
* gapminder\_all.csv

B.1. Using gapminder\_gdp\_asia.csv create a line plot (plot) comparing the GDP of China and India for all years from 1952 to 2007. Include labels on the X and Y axis and a legend, with each country identified, in the lower right corner of the plot.

Cut and paste your all your code (from importing pandas, the dataset, preparation of the dataset for analysis and creation of the plot, with labels and legend and be sure to include a title above the plot--generated with code, NOT added manually). Your code should be complete and executable from beginning to end. Also include an image of your final plot below:

A graph with numbers and lines

Description automatically generated

B.2. This short script creates a plot showing the correlation between GDP and life expectancy for 2007, normalizing marker size by population:

<Import pandas and load the gapminder\_all.csv as data\_all. Declare ‘country’ as the column index.>

data\_all.plot(kind='scatter', x='gdpPercap\_2007', y='lifeExp\_2007',

s=data\_all['pop\_2007']/1e6)

Complete the code above and execute the code. Cut and paste your code and an image of the plot below. Be sure to include a title above the plot--generated with code, NOT added manually.



A graph with blue dots

Description automatically generated

Using online help and documentation, explain in a sentence or two what each argument in **plot** does.

It creates a plot using matplotlib. The default type of plot is a line plot.