Open and virtualized networks - Python Exercises - Part 2

These exercises sets covers some aspects you will find useful for the final exam software development. These exercises are NOT part of the final exam and their goal is to make you get used to Python programming. You are strongly encouraged to find yourself a solution to the presented problems.

Exercise Set 3

NumPy exercises.
Quick tutorial at `https://numpy.org/devdocs/user/quickstart.html`

1. Create a 4X2 integer array and print its attributes
2. Create a 5X2 integer array from a range between 100 to 200 such that the difference between each element is 10
3. Given the following numPy array, return the array of items in the third column of each row
   `[[11 ,22, 33], [44, 55, 66], [77, 88, 99]]`
4. Given the following numPy array, return the array of the odd rows and the even columns
   `[[3 ,6, 9, 12], [15 ,18, 21, 24], [27 ,30, 33, 36], [39 ,42, 45, 48], [51 ,54, 57, 60]]`
5. Add the following two numPy arrays and modify the result array by calculating the square root of each element
   `[[5, 6, 9], [21 ,18, 27]]`
   `[[15 ,33, 24], [4 ,7, 1]]`
6. Sort following NumPy array:
   `[[34,43,73],[82,22,12],[53,94,66]]`
7. Given the following numPy array, print the max of axis 0 and the min of axis 1
   `[[34,43,73],[82,22,12],[53,94,66]]`
8. Given the following numPy array, delete the second column and insert the following new column in its place.
   `[[34,43,73],[82,22,12],[53,94,66]]`
   `new_column = [10,10,10]`

Exercise Set 4

Pandas and matplotlib exercises. Use the sales_data.csv dataset included.
Pandas quick overview: `https://pandas.pydata.org/pandas-docs/stable/getting_started/overview.html`
Matplotlib tutorials: `https://matplotlib.org/3.1.1/tutorials/index.html`

1. Read Total profit of all months and show it using a line plot
2. Get Total profit of all months and show line plot with the following Style properties:
   `label` = 'Profit data of last year'; `color`='r'; `marker`='o';
   `markerfacecolor`='k'; `linestyle`='–'; `linewidth`=3.
3. Read all product sales data and show it using a multiline plot
4. Read toothpaste sales data of each month and show it using a scatter plot
5. Read sales data of bathing soap of all months and show it using a bar chart. Save this plot to your hard disk
6. Read the total profit of each month and show it using the histogram to see most common profit ranges
7. Read Bathing soap facewash of all months and display it using the Subplot

Exercise Set 5

JSON exercises. Use the states.json file included.
Quick overview at `https://realpython.com/python-json/`

1. Write a Python program to convert JSON data to Python objects.
2. Write a Python program to convert Python objects to JSON data.
3. Write a Python program to convert Python objects into JSON strings. Print all the values.
4. Write a Python program to convert Python dictionary objects (sort by key) to JSON data. Print the object members with indent level 4.
5. Write a Python program to convert JSON encoded data into Python objects.
6. Write a Python program to create a new JSON file from an existing JSON file.