DSM 2022 Homework 1- Basics and Numpy Due Date: September 15th

Instructions

- Do an independent work and ensure that it is your own code
- You can refer to the class notebooks
- ***Turning in your colleague's code as your work will result in dismissal from the program***
- ***You can form groups to do the homework but turn in your own unique code.***
- You must submit both **Notebook and Pdf** of your work.
- No extension will be allowed on the homework due date

1. **Question on Functions (20 Points)**
    a. Write a program that calculates the overtime pay using the following steps
    Ask the user the total number of hours per week
    Ask the user the base salary per week
    Assume 40 hours per week and $45.00 per hour
    Assume $50 per hour for overtime pay

2. **Question on List (20 Points)**
    a. Write a program that requests the user to a enter of list of 10 float values stored in variable name called *mylist1 (note the values need to be ordered)*
    b. Use list comprehension to recreate a new list of the same values from mylist1. The new list is called *mylist2*
    c. Sort the values in mylist2

3. **Question on Dictionary (15 Points)**
    a. Write a program that creates a single dictionary consisting of the following key-value pairs (name of dictionary- ***my_dict1***)
    School: MTSU, Textbooks: 14, Level: Elementary, Hobby:Dancing, Height:4.5inch, Food: Amala
    b. Update the dictionary with your credentials.
    For example, change school to your actual school (former or current)
    c. Add new key-pair values such as
    Is_location_USA: True, is_graduated:No
    d. Remove the key-value pair Hobby:Dancing and *delete last entry of the updated dictionary.*

4. Question Numpy (45 Points)

a. Create an array of ones of size 20 by 11 called *myarray1*
b. Multiply scalar of 0.5 by the array
c. Update the 6^{th} row with a value of 10.5
d. Update the 7^{th} row with a value of 11.5
e. Update the 1^{st} column with a value of 9.5
f. Slice the 5^{th} row to the 11^{th} in myarry1
g. Slice the 6^{th} column to 9^{th} column in myarray1
h. Merge the 6^{th} column with 8^{th} column using np.hstack
i. Merge the 5^{th} column with 10^{th} column using np.vstack