Assignment 1

Write a Python program that defines a **Student** class. The class should have the following data members:

1. A string called **name** that stores the name of the student.
2. An integer called **id** that stores the ID of the student.
3. A float called **gpa** that stores the GPA of the student.

The class should have the following methods:

1. A constructor that initializes the **name**, **id**, and **gpa** data members.
2. A method called **get_name** that returns the name of the student.
3. A method called **get_id** that returns the ID of the student.
4. A method called **get_gpa** that returns the GPA of the student.

Your program should prompt the user to enter the name, ID, and GPA of two students. It should then create two **Student** objects with these values and display the name, ID, and GPA of each student.

Your program should then compute and display the average GPA of the two students.

For example, if the user enters the name "John", the ID "1234", and the GPA "3.5" for the first student, and the name "Jane", the ID "5678", and the GPA "4.0" for the second student, your program should create two **Student** objects with these values and display their information. It should also compute the average GPA of the two students (**3.75**) and display it as output.

You should write comments in your code to explain what each section of the code does.

Assignment 2

Write a Python program that does the following:

1. Prompt the user to enter a list of integers, separated by commas.
2. Use a **map** function to square each element in the list.
3. Use a **filter** function to keep only the elements in the squared list that are divisible by 3.
4. Use a **reduce** function to compute the product of all the elements in the filtered list.
5. Use a **lambda** function to create a new list that contains only the even elements in the original list.
6. Use a **map** function to square each element in the even list.
7. Use a **filter** function to keep only the elements in the squared even list that are greater than or equal to 16.
8. Use a **reduce** function to compute the sum of all the elements in the filtered list.

Your program should display the original list, the squared list, the filtered list, the product of the filtered list, the even list, the squared even list, the filtered squared even list, and the sum of the filtered squared even list.

For example, if the user enters the list **[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]**, your program should display the following output:

Original List: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Squared List: [1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
Filtered List: [9, 36, 81]
Product of Filtered List: 26244
Even List: [2, 4, 6, 8, 10]
Squared Even List: [4, 16, 36, 64, 100]
Filtered Squared Even List: [16, 36, 64, 100]
Sum of Filtered Squared Even List: 216

Assignment 3

Write a Python program that does the following:

1. Create a new directory called **my_dir** in the current working directory.
2. Create a new text file called **my_file.txt** in the **my_dir** directory and write the following lines to it:
   Hello, World!
   This is my file.
   It contains some lines of text.
3. Use a **with** statement to open the **my_file.txt** file, read its contents, and print them to the console.
4. Use the **os** module to change the permissions of the **my_file.txt** file so that it is readable only by the owner.
5. Use a **with** statement to open the **my_file.txt** file again, read its contents, and print them to the console.
6. Append the following line to the end of the **my_file.txt** file: **I'm adding a new line to the file!**
7. Use a **with** statement to open the **my_file.txt** file again, read its contents, and print them to the console.

Your program should display the contents of the **my_file.txt** file both before and after the new line is added, and should also demonstrate the change in file permissions.

You should write comments in your code to explain what each section of the code does.