(Composition (Containership))

Write a program contains a class Data_X that has:
  i.   Data members: X[30](double), y(int), n(number of elements).
  ii.   Operators: >> and <<.
  iii. Function to return the sum of elements of X.

It contains a class Data that has:
  i.   Data members: A[30] (Data_X), B[30](double).
  ii.   A function to read data members A, and set the elements of B such that each element B_i is equal to following sum:

$$\sum_{j=0}^{n-1} \begin{cases} X_j^2 & \text{if } X_j \text{ is divisble by } y \\ X_j^3 & \text{otherwise} \end{cases} \text{ for each X for each } A_i \; i = 0, .., n-1.$$

  iii. Friend function to return the following sum:

$$\sum_{i=0}^{n-1} \text{sum of elements of X for each } A_i$$

  iv.   Friend function to return max sum for elements of X for each element A_i for one object.
  v.   Friend function to compare between the max sum for two objects and display max sum and its object.

In main function, define two objects of Data and apply all functions on them.

(Single Inheritance)

Write a program contains a structure Course that has data members C_name (string) , Degree(float), Credit(int). Also, it contains a class Level that has:
  i.   Data members: L[5](Couse).
  ii.   A function to read data members.
  iii. A function Print() to display data members in tabular form.

It contains a class Student which is a subclass from Level that has:
  i.   Data member: name (string), ID(int), total_d(float), total_c(int), GPA(char).
  ii.   A function to read data members, and set the value of total_d which is equal to the sum of all degrees for all courses, total_c which is the sum of Credit for all courses, and set the value of GPA according to the following table:

GPA	Average of degree %
A	≥ 92
B+	84:<90
B	80:<84
C+	75:<80
C	65:<75
D	60:<65
F	<60

    iii.   **A function Print() to display data members in one line.**

In main function, define an array of Student class with length n, read and print the elements of this array in suitable form for each object.

(Multiple Inheritance)

Write a program contains a class Data1 that has:
    i.   **Data members: S1 (string), D1 [20] (double), a(int), n (number of elements).**
    ii.   **A function to read data members.**
    iii.   **A function Sum() to return the following sum:**

$$\sum_{i=0}^{n-1}\sum_{j=i}^{i+1}\begin{cases}D1_i^{2(j+1)} & \text{if } D1_i \text{ is divisble by } a \\ D1_i^{(j+1)} & \text{otherwise}\end{cases}$$

    iv.   **A function display () to display data members.**

It contains a class Data2 that has:
    i.   **Data members: S2 (string), D2[20](double), b(int), m (number of elements).**
    ii.   **A function to read data members.**
    iii.   **A function Sum() to return the following sum:**

$$\sum_{i=0}^{m-1}\sum_{j=i}^{i+1}\begin{cases}D2_i^{2(j+1)} & \text{if } D2_i > b \\ D2_i^{(j+1)} & \text{otherwise}\end{cases}$$

    iv.   **A function display () to display data members.**

It contains a class Data is a subclass of Data1 and Data2 that has:
    i.   **Data members: ND (string), T_sum (int).**
    ii.   **A function to set data members, such that T_sum is the total sum for data members D_1, D_2 for two classes (use Sum() function for each class).**

   iii.   **A function display () to display data members.**
In main function, define several objects of Data class and apply all functions on them.