

1. Write a program contains a class Data that has data members X[30](float), h(int), T[30]( char), n(number of elements of X, T). It contains a function to read data members, and set the elements of T (each element  $T_i = 'Y'$  if  $X_i$  is divisible by h and 'N' otherwise, a function to return the number of X's elements that are not divisible by h ( use T' s elements), a function to return the average of all X's elements that are divisible by h (use T' s elements) , a function to display data members, and a function to compare between the X's averages for two objects and display the object with max value. In main function, define two objects of Data class, and apply all functions on them.
2. Write a program contains a structure Point that has data members: x, y, z as float. This program contains a class Point\_3D that has data members: P[30](Point), N[30] (float), and m(number of elements for P, N). This class includes a function to return the norm for a given Point's object, a function to read data members and set the elements of N such that each  $N_i$  is the norm of point  $P_i$  for  $i=0, .. , m-1$ . It contains a function to return the distance between the first and last points in P, a function to return the max norm in N, a function to compare between max norm for two objects and return the object with max norm, a function to return the minimum distance for first and last points for two objects, and a function to display the data members in tabular form. In main function, define two object of class Point\_3D, and apply all functions on them.

## **Homework**

**Write a program contains a class Num that has data members: N[10] (float) , m (number of elements), and TP[10](string) This class includes a function to return the factorial of a given number positive integer number, a function to test if a given number prime or not, a function to read data members and set the elements of T such that each  $T_i$  is equal to "Yes" if  $N_i$  prime number and "No" otherwise. It contains a function to return the following sum:**

$$\sum N_i! \quad N_i \text{ prime number (use TP's elements)}$$

**It contains a function to return the following product:**

$$\prod N_i! \quad N_i \text{ is not prime number (use TP's elements).}$$

**Finally, it contains a function to display the data members in tabular form. In main function, define an object of class Num and apply all functions on it.**