1. Write a program contains a class **Data** that has data members: D[30][30] (float) n (dimension of the matrix). It contains a function to read data members(D excep last row), a function to check if a given number prime or not, a function to return the max prime in specific column, a function to set elements of last row such that each $D_{n-1,i}$ is the max prime number in cloumn i (for i=0,.., n-2), a function to return the average of last row (virtual function), a function to display the average of last row (not virtual function). Derive a class **Data1** from **Data** that has data members: D1[30] (float) . It contains a function to return a factorial of a given number, a function to set data members such that each $D1_i = (D_{n-1,i})!, \quad for\ i = 0,..,n-1$, a function to display data members, and a function to return the average of all elements of D1. In main function, define pointers from Data class and objects from all classes, use these pointers to apply all functions (use display function in Data class to display all averages for two classes).

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2. Write a program contains a class **Base** class that has data member A[30] (integer), a (int), b(int), n(number of elements). It contains a function to read data members, a function to return the factorial of max number of A (virtual function), and a function to display this factorial (not virtual funtion). Drive from **Base** class two

subclasses **Drive1** and **Drive2**. A class **Drive1** has data member: B[30] (large integer), a function to set the elements of B (each element B_i is equal to $\sum_{j=1}^{A_i} j^2$ *if* A_i *divisble by a and not equal zero or* $\sum_{j=1}^{A_i} j^3$ *if* A_i *is not divisble by a and not equal zero*, and a function to return factorial of max element in B. A class Drive2 has data member: C[30] (large integer), a function to set the elements of C (each element C_i is equal to $\prod_{j=1}^{A_i} j^2$ *if* A_i *is divisble by b and not equal zero or* $\prod_{j=1}^{A_j} j^3$ *if* A_i *is not divisble by b and not equal zero*) , and a function to return the factorial of max element in C, Drive from these two subclasses **Drive1** and **Drive2** a class **Drive**, that has data member: D[3] (large integer) , a function to set data member D such that D_0 is max element in A, D_1 is max element in B, and D_2 is the max element in C, a function to return the factorial of the sum of all elements in D. Define pointers from Data class and objects from all classes, use these pointers to apply all functions (use display function in Base class to display all factorials for all classes).

ملحوظة: لم يتم شرح كيفية استدعاء دالة عادية موجودة فى base lass دالة virtual لطلبة معمل يوم الثلاثاء