7. Programs using friend function

CO2: Map real-world objects into programming objects.

1. Write a C++ program to count number of objects. (static variable)

2. Create a SavingsAccount class. Use a static data member annualInterestRate to store the annual interest rate for each of the savers. Each member of the class contains a private data member savingsBalance indicating the amount the saver currently has on deposit. Provide member function calculateMonthlyInterest that calculates the monthly interest by multiplying the savingsBalance by annualInterestRate divided by 12; this interest should be added to savingsBalance. Provide a static member function modifyInterestRate that sets the static annualInterestRate to a new value. Write a driver program to test class SavingsAccount. Instantiate two different objects of class SavingsAccount, saver1 and saver2, with balances of $2000.00 and $3000.00, respectively. Set the annualInterestRate to 3 percent. Then calculate the monthly interest and print the new balances for each of the savers. Then set the annualInterestRate to 4 percent, calculate the next month's interest and print the new balances for each of the savers.

3. Create a class called **THREE** with three integer values as private members. Find the biggest among the three integer values using friend function. Find the mean of the three numbers of the class using friend function.

4. Create two classes **DM** and **DF** which store the value of distances. DM stores distances in meters and centimeters and DF in feet and inches. Write a C++ program that can read values for the class objects and add one object of DM with another object of DF. Use friend function to carry out the addition operation. The function may display the sum on the units in which the results are required by the user. The display should be in the format of feet and inches or meters and centimeters depending on the user's choice.
   1cm=0.393701inch
   1 inch=2.5400013716cm
   12inch=1 feet
   100cm= 1 m

5. Write C++ program to define **matrix** and **vector** class, and do matrix-vector multiplication using friend function.

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{Bmatrix} (a*x)+ & (b* y) \\ (c*x)+ & (d * y) \end{Bmatrix}$$

   Here a, b, c and d are array elements and x, y are vector elements.

6. Write a C++ Program to illustrate the use of friend keyword to make a member function of one class as friend function of another class.

7. Write a C++ Program to illustrate the use of friend classes in C++ Programming.