**Static Data Member:**

A type of data member that is shared by all objects of a class is known as static data member.

**Syntax:**

The static data member is defined in the class with static keyword.

Static Datatype nameofvariable;

Static int a;

When a data member is defined as static, only one variable is created in the memory even if there are many objects of that class.

**Note:**

in normal variable declaration, a seperate variable is created in the memory for each object of calss.

Static data member is visible only in the class in which It is defined but its life time starts when the program starts its execution. Its life time ends when the entire program is terminated.

It is normally used to share some data among all objects of a particular class.

The main difference between normal data member and static data member is that each object has its own variable of normal data member. On the other hand, static data member is shared among all objects of the class. It means only one memory location is created for the static data member that is share among all objects.

**Program 01:**

**Write a program that counts the number of objects created of particular class.**

//code here.

#include<iostream.h>

class Student

{

**private:**

static int n;

**public:**

Student()

{

n++;

}//end of constructor

void show()

{

cout<<"you Have Created"<<n<<"objects"<<endl;

}//end of show

};//end of Student

int Student::n=0; //you must assigned value to static data member outside the class

int main()

{

Student x,y,z;

x.show();

Student g;

x.show();

}//end of main

The above program declares a static data member **n** to count number of objects that have been created.

The following statement defines the variable:

Int Student::n=0;

The above statement defines the variable and initializes it to zero value. the static variable n is defined outside the class because it will not be part of any object. It is created only once in the memory and is shared among all objects of the class. The variable definition outside the class must be preceded with class name and scope resolution operator (::).

The above program creates three objects **x,y** and **z**. Each time an object is created, the constructor is executed that increases the value of **n** by 1

**Program 02:**

**Write a program that creates three objects of class Student. Each object of class Student must assigned a unique Roll Number automatically when a new object is created.**

(**Hint:**  Use static data member for unique Roll Number)

#include<iostream.h>

class Student

{

private:

static int r;

int rollNo;

int marks;

char name[50];

public:

Student()

{

r++;

rollNo=r;

}//end of constructor

void setStudentDetails()

{

cout<<"Enter Name:";

cin>>name;

cout<<"Enter Marks:";

cin>>marks;

}//end of setStudentDetails

void showStudentDetails()

{

cout<<"Roll No:"<<rollNo<<endl;

cout<<"Student Name:"<<name<<endl;

cout<<"Student Marks:"<<marks<<endl;

}//end of showStudentDetails

};//end of Student

int Student::r=0; // initialize static data member once only outside the class as it is shared

//by all objects of class

void main()

{

Student s1,s2,s3;

s1.setStudentDetails();

s2.setStudentDetails();

s3.setStudentDetails();

s1.showStudentDetails();

s2.showStudentDetails();

s3.showStudentDetails();

}//end of main

