



CLASSES AND OBJECTS

✓ #Tag	CLASSES AND OBJECTS
☰ king topic	C++ WITH OOPS

INTRODUCTION

- Imagine of an school class in which you are sitting with your friends .
- Now you and your friend both have some common parameters like :
 - Name .
 - Age .
 - Gender .
- But the only difference is that they all have different values .
- Similarly , classes are the group of objects having same parameters but different values .
- Without objects classes cannot exist .



Three types of access specifiers :

public
private
protected .

- objects are important in order to access the class .

CLASSES

PUBLIC

- In this all the data members and functions present below this can be accessed anywhere in the program even outside the class .

PRIVATE

- All the data members and member functions can only be accessed into its own class .
- Private data members and member functions can be accessed by using friend functions also .

PROTECTED

- It is just like private but the only difference is it is used in inheritance of class .
- At inheritance level protected members of parent class can be accessed by the child class .



If no access specifier is mentioned in the class then it is private by default

DATA MEMBERS

- These are defined variables present in the class .

MEMBER FUNCTIONS

- These are the functions designed in the class in order to access the data member .

Class Class_name

{
 Access Specifiers ; // private , protected , public
 Data Members ; // Variables
 Member Functions ; // Function to access data Member.

}

```
class class_name
{
    Access specifiers ; //public , private and protected .
    Data members ; //Variables defined in the class .
    Member functions; //Functions to access data members .
}
```

FOR EXAMPLE :

- In the below code the volume of cuboid is founded by using the concept of classes and objects .
- The function which is declared in the below code are the functions which are declared and defined in the ckass .

```
#include <iostream>
using namespace std;

class volume
{
public:
    int length;
    int breadth;
    int height;

    void cuboid()
    {
        int final = length*breadth*height;
        cout<<"The volume of the cuboid is "<<final<<endl;
    }
};

int main()
```

```

{
    volume v1;
    int choice;
    cout<<"Please enter the length of cuboid : ";
    cin>>v1.length;
    cout<<"Please enter the breadth of cuboid : ";
    cin>>v1.breadth;
    cout<<"Please enter the height of cuboid : ";
    cin>>v1.height;
    cout<<"Please enter 1 to print the volume "<<endl<<"Please enter 0 to exit "<<endl;
}
cin>>choice;
if (choice == 1)
{
    v1.cuboid();
}
else
{
    return 0;
}

return 0;
}

```

OUTSIDE FUNCTIONS OF CLASSES

- You can also create the classes functions in two types :
 - Declaring and defining in the class .
 - Declaring inside and defining outside the class .
- Here we will talk about defining the function outside the class .

```

#include <iostream>
using namespace std;

class volume
{
public:
    int length;
    int breadth;
    int height;
    void cuboid();
}v1;

int main()
{
    int choice;
    cout << "Please enter the length of cuboid : ";
    cin >> v1.length;
    cout << "Please enter the breadth of cuboid : ";
    cin >> v1.breadth;
}

```

```

        cout << "Please enter the height of cuboid : ";
        cin >> v1.height;
        v1.cuboid();

        return 0;
    }
    void volume::cuboid()
    {
        int final = v1.length * v1.breadth * v1.height;
        cout << "The volume of the cuboid is " << final << endl;
    }
}

```

OBJECT ARRAY

- It is defined as the array of the objects .
- It is difficult to declare objects when they are greater than 100 or more .
- Then at that time we require the object array .
- The sample code of the object array is given below :

```

#include <iostream>
using namespace std;

//Here public is used in access these attributes publicly
//Now all the attributes and function in the class written above public will be considered as private .

class student{
public:
    string name ;
    int age;
    int roll_number;
    int total_marks;
};

int main()
{
    //Now here we will declare the object array like this
    student arr[4]; //In the brackets place the last index till you want array .
    //Now we will enter the value in the array by using simple loops
    for (int i = 1; i <= 3; i++)
    {
        cout<<"Please enter the name of "<<i<<" student : ";
        cin>>arr[i].name;
        cout<<"Please enter the age of "<<i<<" student : ";
        cin>>arr[i].age;
        cout<<"Please enter the roll number of "<<i<<" student : ";
        cin>>arr[i].roll_number;
        cout<<"Please enter the total marks of "<<i<<" student : ";
        cin>>arr[i].total_marks;

        cout<<endl;
}

```

```

    }
    for (int i = 1; i <= 3; i++)
    {
        cout<<"enterd name of "<<i<<" student : "<<arr[i].name<<endl;
        cout<<"enterd age of "<<i<<" student : "<<arr[i].age<<endl;
        cout<<"enterd roll_number of "<<i<<" student : "<<arr[i].roll_number<<endl;
        cout<<"enterd total_marks of "<<i<<" student : "<<arr[i].total_marks<<endl;

    }

    return 0;
}

```



Exercise : Create a class car having data members :
 company name
 top speed
 create 2 member function
 set data
 display data

THE CODE OF THE ABOVE PROBLEM IS GIVEN BELOW

```

#include <iostream>
using namespace std;

class car
{
    string company_name;
    int top_speed;

public:
    void set_data(string a, int b)
    {
        company_name = a;
        top_speed = b;
    }

    void print_data()
    {
        cout << "The name of the company is : " << company_name << endl;
        cout << "The top speed of car is : " << top_speed << endl;
    }
} c[2];

int main()
{

```

```
string name;
int speed;
for (int i = 0; i <= 1; i++)
{
    cout << "Please enter the company name of "<<i+1<<" car : ";
    cin >> name;
    cout << "Please enter the top speed of "<<i+1<<" car : ";
    cin >> speed;
    c[i].set_data(name, speed);
}
for (int i = 0; i <= 1; i++)
{
    cout<<"THE DETAILS OF "<<i+1<<" car"<<endl;
    c[i].print_data();
}

return 0;
}
```