

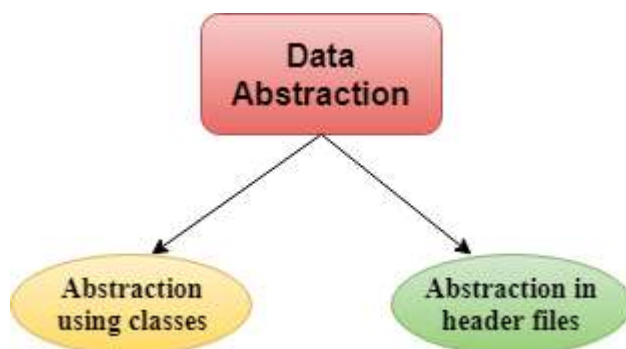
Data Abstraction in C++

- Data Abstraction is a process of providing only the essential details to the outside world and hiding the internal details, i.e., representing only the essential details in the program.
- Data Abstraction is a programming technique that depends on the separation of the interface and implementation details of the program.
- C++ provides a great level of abstraction. For example, `pow()` function is used to calculate the power of a number without knowing the algorithm the function follows.

In C++ program if we implement class with private and public members then it is an example of data abstraction.

Data Abstraction can be achieved in two ways:

- Abstraction using classes
- Abstraction in header files.



Abstraction using classes: An abstraction can be achieved using classes. A class is used to group all the data members and member functions into a single unit by using the access specifiers. A class has the responsibility to determine which data member is to be visible outside and which is not.

Abstraction in header files: Another type of abstraction is header file. For example, `pow()` function available is used to calculate the power of a number without actually knowing which algorithm function uses to calculate the power. Thus, we can say that header files hide all the implementation details from the user.

// program to calculate the power of a number.

```
#include <iostream>
#include<math.h>
using namespace std;
int main()
{
    int n = 5;
    int power = 3;
    int result = pow(n,power);
    std::cout << "Cube of n is : " <<result<< std::endl;
    return 0;
}
```

Let's see a simple example of data abstraction using classes.

```
#include <iostream>
using namespace std;
class Sum
{
    private: int x, y, z;
    public:
    void add()
    {
        cout<<"Enter two numbers: ";
        cin>>x>>y;
        z= x+y;
        cout<<"Sum of two number is: "<<z<<endl;
    }
};
int main()
{
    Sum sm;
```

```
sm.add();
```

```
return 0;
```

```
}
```