C++ Friend function

If a function is defined as a friend function in C++, then the protected and private data of a class can be accessed using the function.

By using the keyword friend compiler knows the given function is a friend function.

For accessing the data, the declaration of a friend function should be done inside the body of a class starting with the keyword friend.

Declaration of friend function in C++

```
class class_name
{
   friend data_type function_name(argument/s);          // syntax of friend function.
};
```

C++ friend function Example

Let's see the simple example of C++ friend function used to print the length of a box.

```
#include <iostream>
using namespace std;
class Box
{
   private:
      int length;
   public:
      Box(): length(0) { }
      friend int printLength(Box); //friend function
```

```
};
int printLength(Box b)
{
  b.length += 10;
   return b.length;
}
int main()
{
   Box b;
   cout<<"Length of box: "<< printLength(b)<<endl;
   return 0;
}
```

Let's see a simple example when the function is friendly to two classes.

```
#include <iostream>
using namespace std;
class B;        // forward declarartion.
class A
{
   int x;
   public:
   void setdata(int i)
   {
      x=i;
   }
   friend void min(A,B);        // friend function.
```

```
};
class B
{
   int y;
   public:
   void setdata(int i)
   {
      y=i;
   }
   friend void min(A,B);                  // friend function
};
void min(A a,B b)
{
   if(a.x<=b.y)
   std::cout << a.x << std::endl;
   else
   std::cout << b.y << std::endl;
}
  int main()
{
  A a;
  B b;
  a.setdata(10);
  b.setdata(20);
  min(a,b);
   return 0;
```

```
}
```

C++ Friend class

A friend class can access both private and protected members of the class in which it has been declared as friend.

Let's see a simple example of a friend class.

```
#include <iostream>
using namespace std;
class A
{
   int x =5;
   friend class B;          // friend class.
};
class B
{
  public:
   void display(A &a)
   {
      cout<<"value of x is : "<<a.x;
   }
};
int main()
{
   A a;
   B b;
   b.display(a);
   return 0;
```

```
}
```