Class Template: Friends

In this lesson, we will learn about friends of class templates.

Friends of a class template have access to all members of the class template

A class or a class template can have a friendship three features: to class or class templates, to function or function templates, and to types.

Rules:

1. The declaration of friends can be made in an arbitrary place in the class declaration.
2. The access rights in the class have no influence.
3. Friendship will not be inherited.
4. Friendship is not transitive.

> **Note:** A friend has unrestricted access to the members of the class.

General Friends

A class or class template can grant friendship to each instance of a class template or function template.

```
template <typename T> int myFriendFunction(T);
```

```
template <typename T> class MyFriend;

template <typename T>
class GrantingFriendshipAsClassTemplate{
  template <typename U> friend int myFriendFunction(U);
  template <typename U> friend class MyFriend;
  ...
```

> When a class template grants friendship to a template, the typename of
> the class template should be different from the typename of the
> template. If both use the same name, the friendship is only granted for
> the same types.

Class Template: Special Friends

A special friendship will occur if friendship depends on the type of the
template parameter.

```
template <typename T> int myFriendFunction(T);
template <typename T> class MyFriend;

template <typename T>
class GrantingFriendshipAsClassTemplate{
  friend int myFriendFunction<>(double);
  friend class MyFriend<int>
  friend class MyFriend<T>;
```

If the name of the template parameter is identical with the name of the
template parameter granting the friendship, the friendship will occur
between the instances of the same type.

Friend to Types

A class template can grant its friendship to a type parameter.

```
template <typename T>
class Array{
  friend T; ...
};

Array<Account> myAccount;
```

In the next lesson, we'll take a look at examples of friends of class templates.