

# JMultiComparibale

The template class `JMultiComparibale` resides in the name space `JLANG` and constitutes an auxiliary *base* class. Like the template class `JComparibale`, it implements the (not-)equal operators `==` and `!=` as well as the comparison operators `<`, `<=`, `>` and `>=` of a derived class. In this case, the class can be derived from multiple other base classes, some of which providing for the policy method `less`. Here, a second template argument is used that corresponds to a so-called type list. The (not-)equal and comparison operators of the derived class corresponds to the (not-)equal and comparison operators of the base classes in the type list. In this, the order determines the comparison hierarchy. The type list can conveniently be specified with class `JTYPELIST`.

For example, the following classes `A` and `B` derive from `JComparibale`.

```
struct A :
{
    public JComparable<A>
    {
        A() :
            value(0)
        {}

        A(const int value) :
            value(value)
        {}

        bool less(const A& object) const
        {
            return this->value < object.value;
        }

        int value;
    };
};

struct B :
{
    public JComparable<B>
    {
        B() :
            value(0)
        {}

        B(const int value) :
            value(value)
        {}

        bool less(const B& object) const
        {
            return this->value < object.value;
        }

        int value;
    };
};
```

Here, the classes `C` and `D` derive from `MultiJComparibale` but with different type lists.

```
struct C :
{
    public A,
    public B,
    public JMultiComparable<C, JTYPELIST<A, B>::typelist>
    {
        C(const int a, const int b) :
            A(a),
            B(b)
        {}
    };
};

struct D :
{
    public A,
    public B,
    public JMultiComparable<D, JTYPELIST<B, A>::typelist>
    {
        D(const int a, const int b) :
            A(a),
            B(b)
        {}
    };
};
```

The following example

```
C c1(1, 0);
C c2(0, 1);

cout << (c1 == c2) << endl;
cout << (c1 != c2) << endl;
cout << (c1 < c2) << endl;
cout << (c1 <= c2) << endl;
```

```
cout << (c1 > c2) << endl;  
cout << (c1 >= c2) << endl;
```

will produce

```
0  
1  
0  
0  
1  
1
```

and

```
D d1(1, 0);  
D d2(0, 1);  
  
cout << (d1 == d2) << endl;  
cout << (d1 != d2) << endl;  
cout << (d1 < d2) << endl;  
cout << (d1 <= d2) << endl;  
cout << (d1 > d2) << endl;  
cout << (d1 >= d2) << endl;
```

will produce

```
0  
1  
1  
1  
0  
0
```

As can be seen, the comparison hierarchy of class C and D is inverted. Note that without `JMultiComparibale`, the compiler would have detected an error due to the ambiguity of the the (not-)equal operators.