

# JComparable

The template class `JComparable` resides in the name space `JLANG` and constitutes an auxiliary *base* class. In analogy with class `JEquals`, it implements the (not-)equal operators `==` and `!=` as well as the comparison operators `<`, `<=`, `>` and `>=` of a derived class.

To make this work, a derived class `X` should provide for the policy method `bool less(const X&) const`.

```
class X :
    public JComparable<X>
{
    public:
    bool less(const X&) const { // implementation }
};
```

For example.

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

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

    int value;
};

A a1(0);
A a2(1);

cout << (a1 == a2) << endl;
cout << (a1 != a2) << endl;
cout << (a1 < a2) << endl;
cout << (a1 <= a2) << endl;
cout << (a1 > a2) << endl;
cout << (a1 >= a2) << endl;
```

will produce

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

The class `JComparable` allows for a second template parameter. In that case, the (not-)equal and comparison operators are extended and also apply to a value corresponding to the second data type. In this

case, two additional policy methods should be provided, namely `bool less(const T&) const` and `bool more(const T&) const`, where T refers to the second template argument.

For example.

```
struct B :
    public JComparable<B>,
    public JComparable<B, A>
{
    B(const int value) :
        value(value)
    {}

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

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

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

    int value;
};

B b1(0);
B b2(1);

cout << (b1 == b2) << ' ' << (b1 == a2) << ' ' << (a2 == b1) << endl;
cout << (b1 != b2) << ' ' << (b1 != a2) << ' ' << (a2 != b1) << endl;
cout << (b1 < b2) << ' ' << (b1 < a2) << ' ' << (a2 > b1) << endl;
cout << (b1 <= b2) << ' ' << (b1 <= a2) << ' ' << (a2 >= b1) << endl;
cout << (b1 > b2) << ' ' << (b1 > a2) << ' ' << (a2 <= b1) << endl;
cout << (b1 >= b2) << ' ' << (b1 >= a2) << ' ' << (a2 < b1) << endl;
```

will produce

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