

Classes (Part 6)

Overloading ++

1. Unary operators

Unary operators are operators that need only one operand instead of two operands such as the ++ or the negation.

2. Overloading ++

There are two versions of the ++ operator, a prefix version and a postfix version. For example, you can do either ++i or i++.

Height.h file

```
////////////////////////////////////  
// Class declaration  
class Height {  
private:  
    int feet;  
    int inches;  
public:  
    /*****  
     * unary prefix operator++  
     * ++ht;  
     */  
    Height operator++();  
  
    /*****  
     * unary postfix operator++  
     * ht++;  
     */  
    Height operator++(int);    // has to be an int in the argument  
    ...  
}
```

Height.cpp file

```

////////////////////////////////////
// Class definition
#include "Height.h"

/*****
 * unary prefix operator++
 * ++t;
 */
Height Height::operator++() {
    inches++; // increment myself, this object
    return *this; // return myself, the incremented object
}

/*****
 * unary postfix operator++
 * t++;
 */
Height Height::operator++(int) {
    Height ht(feet, inches); // save the original object
    inches++; // increment myself, this object
    return ht; // return the original object
}

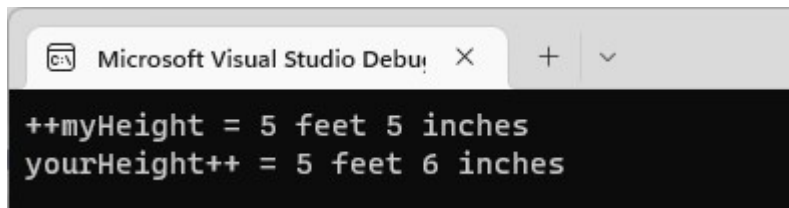
```

main.cpp file

```

Height myHeight(5, 4), yourHeight(5, 6);
cout << "++myHeight = " << ++myHeight << endl;
cout << "yourHeight++ = " << yourHeight++ << endl;

```

Output


The screenshot shows the Microsoft Visual Studio Debug Console window. The output text is as follows:

```

++myHeight = 5 feet 5 inches
yourHeight++ = 5 feet 6 inches

```

3. Exercises (Problems with an asterisk are more difficult)

1. Overload the -- operator for the Height class. This will subtract one inch from the height.
2. Overload the ++ operator for the Circle class.
3. Overload the -- operator for the Circle class.
4. Overload the ++ operator for the Temperature class. This will add one degree to the temperature.
5. Overload the -- operator for the Temperature class. This will subtract one degree from the temperature.
6. Overload the negation - operator for the Temperature class. This changes the sign of the degree from positive to negative and vice versa.
7. Overload the ++ operator for the Date class. This will add one day to the current date. Check for rollovers at the end of the month.