

Programming Session Assignment 12

2017/12/25 by TA 陳泓弦

REQUIRED FILES

Please **compress a folder** named **PSA12_b06901XXX** (student ID) that contains the following files:



Do not submit executable files (.exe). Files with names in wrong format will not be graded. In your .cpp files, we suggest you write comments in details as much as you can. It will be good for TAs to read your code and for your future reference and maintenance. (Due date: 12/28 06:00)

PROBLEM DESCRIPTION

1. [Required file: Point2D.cpp && Point2D.h]

Construct a class named “Point2D” that stores the position of x and y coordinates. Class Point2D should have two kinds of constructors, overloaded operators <<, +, -, ++, --, to support the following main function. In this problem, you only need to submit Point2D.h and Point2D.cpp in the b06901XXX_p1 folder.

main()

Output:

```
int main() {
    Point2D p1(5, 5);
    Point2D p2(10, 10);
    Point2D p3;

    cout << "p3(x, y) = ("
         << p3
         << ")" << endl;

    p3 = p1 + p2;
    cout << "p3(x, y) = ("
         << p3
         << ")" << endl;

    p3 = p2 - p1;
    cout << "p3(x, y) = ("
         << p3
         << ")" << endl;

    p3 = ++p1;
    cout << "p3(x, y) = ("
         << p3
         << ")" << endl;

    return 0;
}
```

```
p3(x, y) = (0,0)
p3(x, y) = (15,15)
p3(x, y) = (5,5)
p3(x, y) = (6,6)
```

2. [Required file: HugeInt.cpp && HugeInt.h]

A machine with 32-bit integers can represent integers in the range of approximately -2 billion to +2 billion. Now we would like to be able to use a much wider range of integers. Please construct a class HugeInt to calculate value larger than this range. Class HugeInt should have constructors, overloaded operators <<, +, += to support the following main function. We will test values with a maximum of 30 digits and test positive values only. That is, you could use an array with 30 elements to store huge integers and you do not need to deal with the sign of value in this problem. You only need to submit HugeInt.h and HugeInt.cpp in the b06901XXX_p2 folder.

main()

```
int main() {
    HugeInt n1("99999999999999999999999999999999");
    HugeInt n2("1");
    HugeInt n3;

    cout << "n1 is " << n1 << "\nn2 is " << n2
         << "\nn3 is " << n3 << endl;

    n3 = n1 + n2;
    cout << n1 << " + " << n2 << "\n= " << n3 << endl;

    n3 += n2;
    cout << "n3 is " << n3 << endl;

    return 0;
}
```

Output:

```
n1 is 99999999999999999999999999999999
n2 is 1
n3 is 0
99999999999999999999999999999999 + 1
= 1000000000000000000000000000000000
n3 is 10000000000000000000000000000001
```