

```
1 #include <iostream>
2 #include <cmath>
3 #include "V2D.h"
4
5
6 int main() {
7     // Try the constructor
8     v2d v1(3, 0);
9     v2d v2(0, 4);
10    v2d v3(3, 2);
11
12    // Try the copy constructor:
13    v2d v4(v2);
14
15    // Try the overloaded operator
16    std::cout << "v1 = " << v1 << std::endl;
17    std::cout << "v2 = " << v2 << std::endl;
18    std::cout << "v3 = " << v3 << std::endl;
19    std::cout << "v4 = " << v4 << '\n' << std::endl;
20
21    // Test
22    std::cout << "Pythagoras holds on perpendicular triangles (a,b,c):\n";
23    std::cout << "a=" << v1.length();
24    std::cout << " , b=" << v2.length();
25
26    // Try operators + and *
27    // NOTE: precedence of the original operators should be the same.
28    // This vector corresponds to the diagonal of the triangle defined
29    // by v1 and v2
30
31    v2d v5 = v1 + v2 * (-1);
32
33    std::cout << " , c=" << v5.length() << '\n' << std::endl;
34    std::cout << "...but not on non-perpendicular triangles (a,b,c):\n";
35    std::cout << "a=" << v3.length();
36    std::cout << " , b=" << v4.length();
37
38    v5 = v3 + v4 * (-1);
39
40    std::cout << " , c=" << v5.length() << '\n' << std::endl;
41    std::cout << "Note that vector operations like + and * ";
42    std::cout << "modify the vectors on the left!" << '\n' << std::endl;
43    std::cout << "v5 = v3 + v4 * (-1) : " << v5 << std::endl;
44    std::cout << "v3 = " << v3 << std::endl;
45    std::cout << "v4 = " << v4 << std::endl;
46    return 0;
47 }
48 /*
49 Output should be:
50 Pythagoras holds on perpendicular triangles:
51 a=3 b=4 c=5
52 ...but not on non-perpendicular triangles:
53 a=3.60555 b=4 c=3.60555
54 */
```