

```
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
35     std::cout << "...but not on non-perpendicular triangles (a,b,c): \n";
36     std::cout << "a=" << v3.length();
37     std::cout << " , b=" << v4.length();
38
39     v5 = v3 + v4 * (-1);
40
41     std::cout << " , c=" << v5.length() << '\n' << std::endl;
42
43     std::cout << "Note that vector operations like + and * ";
44     std::cout << "modify the vectors on the left!" << '\n' << std::endl;
45     std::cout << "v5 = v3 + v4 * (-1) : " << v5 << std::endl;
46     std::cout << "v3 = " << v3 << std::endl;
47     std::cout << "v4 = " << v4 << std::endl;
48     return 0;
49 }
50
51
52 /*
53 Output should be:
54 Pythagoras holds on perpendicular triangles:
55 a=3 b=4 c=5
56 ...but not on non-perpendicular triangles:
57 a=3.60555 b=4 c=3.60555
58 */
```