```cpp
 1: // $Id: sizeof.cpp,v 1.20 2014-03-31 13:02:39-07 - - $
 2:
 3: #include <cstdlib>
 4: #include <cwchar>
 5: #include <iostream>
 6: #include <map>
 7: #include <stack>
 8: #include <vector>
 9:
10: using namespace std;
11:
12: #define SHOW(Type) \
13:    cout << "sizeof (" << #Type << ") = " << sizeof (Type) << endl;
14:
15: class empty {
16: };
17:
18: class one {
19:    int x;
20: };
21:
22: class virt_one {
23:    int x;
24:    virtual void fn1 ();
25:    virtual ˜virt_one ();
26: };
27:
28: class virt_two {
29:    int y;
30:    virtual void fn2 ();
31:    virtual ˜virt_two ();
32: };
33:
34: class single: public virt_one {
35:    int z;
36:    virtual void fn3 ();
37:    virtual ˜single ();
38: };
39:
40: class multiple: public virt_one, virt_two {
41:    int z;
42:    virtual void fn3 ();
43:    virtual ˜multiple ();
44: };
45:
46: vector<int> vector_of_int_64 (64);
47:
```

```
48:
49: int main (int argc, char **argv) {
50:     (void) argc; // SUPPRESS: warning: unused parameter 'argc'
51:     (void) argv; // SUPPRESS: warning: unused parameter 'argv'
52:
53:     SHOW (bool);
54:     SHOW (char);
55:     SHOW (short);
56:     SHOW (int);
57:     SHOW (long);
58:     SHOW (long long);
59:     SHOW (float);
60:     SHOW (double);
61:     SHOW (long double);
62:     SHOW (wchar_t);
63:     SHOW (char16_t);
64:     SHOW (char32_t);
65:     SHOW (char*);
66:     SHOW (void*);
67:     SHOW (int*);
68:     SHOW (empty);
69:     SHOW (one);
70:     SHOW (virt_one);
71:     SHOW (virt_two);
72:     SHOW (single);
73:     SHOW (multiple);
74:     SHOW (vector<int>);
75:     SHOW (vector_of_int_64);
76:     SHOW (vector<string>);
77:     SHOW (string);
78:     SHOW (stack<string>);
79:     typedef map<string, int> map_string_int;
80:     SHOW (map_string_int);
81:     return EXIT_SUCCESS;
82: }
83:
84: //TEST// ./sizeof >sizeof.lis 2>&1
85: //TEST// mkpspdf sizeof.ps sizeof.cpp* sizeof.lis
86:
```

```
 1: * @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: starting sizeof.cpp
 2: * sizeof.cpp: $Id: sizeof.cpp,v 1.20 2014-03-31 13:02:39-07 - - $
 3: * g++ -g -O0 -Wall -Wextra -std=gnu++11 sizeof.cpp -o sizeof -lm
 4: * rm -f sizeof.o
 5: * @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: finished sizeof.cpp
```

```
 1: sizeof (bool) = 1
 2: sizeof (char) = 1
 3: sizeof (short) = 2
 4: sizeof (int) = 4
 5: sizeof (long) = 8
 6: sizeof (long long) = 8
 7: sizeof (float) = 4
 8: sizeof (double) = 8
 9: sizeof (long double) = 16
10: sizeof (wchar_t) = 4
11: sizeof (char16_t) = 2
12: sizeof (char32_t) = 4
13: sizeof (char*) = 8
14: sizeof (void*) = 8
15: sizeof (int*) = 8
16: sizeof (empty) = 1
17: sizeof (one) = 4
18: sizeof (virt_one) = 16
19: sizeof (virt_two) = 16
20: sizeof (single) = 16
21: sizeof (multiple) = 32
22: sizeof (vector<int>) = 24
23: sizeof (vector_of_int_64) = 24
24: sizeof (vector<string>) = 24
25: sizeof (string) = 8
26: sizeof (stack<string>) = 80
27: sizeof (map_string_int) = 48
```