```
 1: // $Id: exceptions.cpp,v 1.32 2013-06-28 19:51:19-07 - - $
 2:
 3: // Illustrate some exceptions.
 4:
 5: #include <cstdlib>
 6: #include <iostream>
 7: #include <typeinfo>
 8: #include <vector>
 9:
10: using namespace std;
11:
12: #define SHOW(STMT) \
13:         cout << __func__ << "[" << __LINE__ << "]: SHOW (" \
14:              << #STMT << ")" << endl; \
15:         STMT
16:
17: void fn_bad_alloc() {
18:    SHOW (vector<int> v0(-5);)
19: }
20:
21: void fn_out_of_range() {
22:    SHOW (vector<int> v1(10);)
23:    SHOW (v1.at(-5) = 8;)
24: }
25:
26: void fn_pop_empty_vector() {
27:    SHOW (vector<int> v2(10);)
28:    SHOW (v2.pop_back();)
29: }
30:
31: void fn_back_empty_vector() {
32:    SHOW (vector<int> v3(10);)
33:    SHOW (cout << ".... " << v3.back() << endl;)
34: }
35:
36: int main (int argc, char **argv) {
37:    for (int argi = 1; argi < argc; ++argi) {
38:       for (char *chari = argv[argi]; *chari != '\0'; ++chari) {
39:          try {
40:             switch (*chari) {
41:                case 'b': fn_bad_alloc(); break;
42:                case 'o': fn_out_of_range(); break;
43:                case 'p': fn_pop_empty_vector(); break;
44:                case 'e': fn_back_empty_vector(); break;
45:             }
46:          }catch (exception &err) {
47:             cout << ".... exception " << typeid (err).name()
48:                  << ", what = \"" << err.what() << "\"" << endl;
49:          }
50:       }
51:    }
52:    fn_bad_alloc(); // Throw an uncaught exception.
53:    return 0;
54: }
55:
56: //TEST// ./exceptions b o p e 2>&1 >exceptions.lis
57: //TEST// mkpspdf exceptions.ps exceptions.cpp* exceptions.lis
58:
```

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1: * @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: starting exceptions.cpp
2: * exceptions.cpp: $Id: exceptions.cpp,v 1.32 2013-06-28 19:51:19-07 -
3: - $
4: * g++ -g -O0 -Wall -Wextra -std=gnu++11 exceptions.cpp -o exceptions
5: -lm
6: * rm -f exceptions.o
7: * @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: finished exceptions.cpp
```

```
 1: fn_bad_alloc[18]: SHOW (vector<int> v0(-5);)
 2: .... exception St9bad_alloc, what = "std::bad_alloc"
 3: fn_out_of_range[22]: SHOW (vector<int> v1(10);)
 4: fn_out_of_range[23]: SHOW (v1.at(-5) = 8;)
 5: .... exception St12out_of_range, what = "vector::_M_range_check"
 6: fn_pop_empty_vector[27]: SHOW (vector<int> v2(10);)
 7: fn_pop_empty_vector[28]: SHOW (v2.pop_back();)
 8: fn_back_empty_vector[32]: SHOW (vector<int> v3(10);)
 9: fn_back_empty_vector[33]: SHOW (cout << ".... " << v3.back() << endl;)
10: .... 0
11: fn_bad_alloc[18]: SHOW (vector<int> v0(-5);)
```