

```
1: // $Id: catfile.cpp,v 1.23 2014-05-29 15:32:51-07 - - $
2:
3: // NAME
4: //      catfile - concatenate files and print
5: //
6: // SYNOPSIS
7: //      cat [-aemntv] [filename...]
8: //
9: // DESCRIPTION
10: //      Display files to stdout.  If no filenames are specified,
11: //      read from stdin.
12: //
13: // OPTIONS
14: //      -a  same as -mntv
15: //      -e  display $ at end of each line
16: //      -m  display headings before files as in more(1)
17: //      -n  display line numbers before each line
18: //      -v  display all non-isgraph characters visibly
19:
20: #include <algorithm>
21: #include <cstring>
22: #include <fstream>
23: #include <iomanip>
24: #include <iostream>
25: #include <locale>
26: #include <stdexcept>
27: #include <string>
28: #include <vector>
29: using namespace std;
30:
31: #include <libgen.h>
32: #include <unistd.h>
33:
```

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34:
35: struct {
36:     string name {};
37:     int status {EXIT_SUCCESS};
38: } program;
39:
40: void error (const string& message) {
41:     cerr << program.name << ": " << message << endl;
42:     program.status = EXIT_FAILURE;
43: }
44:
45: struct options {
46:     bool e_endline {};
47:     bool m_more {};
48:     bool n_numbers {};
49:     bool v_visible {};
50:     vector<string> filenames;
51:     locale olocale {"en_US.iso88591"};
52:     options (int argc, char**argv) {
53:         opterr = false;
54:         for (;;) {
55:             int opt = getopt (argc, argv, "aemntv");
56:             if (opt == EOF) break;
57:             switch (opt) {
58:                 case 'a': m_more = n_numbers = v_visible = true; break;
59:                 case 'e': e_endline = true; break;
60:                 case 'm': m_more = true; break;
61:                 case 'n': n_numbers = true; break;
62:                 case 'v': v_visible = true; break;
63:                 default: error (string ("-") + static_cast<char> (optopt)
64:                                + ": invalid option");
65:                     break;
66:             }
67:         }
68:         for_each (&argv[optind], &argv[argc],
69:                 [this] (const string& arg) {
70:                     filenames.push_back (arg);
71:                 });
72:         if (filenames.size() == 0) filenames.push_back ("-");
73:     }
74: };
75:
```

```
76:
77: void copyfile (const string& filename, istream& input,
78:               const options& opts) {
79:     if (opts.m_more) {
80:         string colons {":::::::::::::::::::::"};
81:         cout << colons << endl << filename << endl << colons << endl;
82:     }
83:     for (int lcount = 1;; ++lcount) {
84:         string line;
85:         getline (input, line);
86:         if (input.eof()) break;
87:         if (opts.n_numbers) cout << setw(6) << lcount << "\t";
88:         if (not opts.v_visible) cout << line;
89:         else {
90:             for (char byte: line) {
91:                 if (isprint (byte, opts.olocale)) cout << byte;
92:                 else if ((byte & 0x80) == 0) {
93:                     cout << "^" << static_cast<char> (byte ^ 0x40);
94:                 }else {
95:                     cout << "\\x" << setw(2) << hex << uppercase
96:                        << static_cast<int> (byte & 0xFF);
97:                 }
98:             }
99:         }
100:         if (opts.e_endline) cout << "$";
101:         cout << endl;
102:     }
103: }
104:
105: int main (int argc, char** argv) {
106:     program.name = basename (argv[0]);
107:     options opts (argc, argv);
108:     for (const auto& filename: opts filenames) {
109:         if (filename == "-") copyfile (filename, cin, opts);
110:         else {
111:             ifstream infile (filename);
112:             if (not infile.fail()) copyfile (filename, infile, opts);
113:             else error (filename + ": " + strerror (errno));
114:         }
115:     }
116:     return program.status;
117: }
118:
119: //TEST// ./catfile -a /error in.data 256 >catfile.out 2>&1
120: //TEST// mkpspdf catfile.ps catfile.cpp* catfile.out
121:
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U -lGL -lX11 -lm -lrt
```

```
1: catfile: /error: No such file or directory
2: ::::::::::::::
3: in.data
4: ::::::::::::::
5:      1  total 74
6:      2  drwx-----.  3 wmackey users   2048 May 29 12:42 .
7:      3  drwx-----. 23 wmackey users   2048 May 29 12:05 ..
8:      4  -rw-----.  1 wmackey users 12288 May 29 12:42 .cpbytes.cpp.swp
9:      5  drwx-----.  2 wmackey users   2048 May 29 12:42 RCS
10:     6  -rwx-----.  1 wmackey users 54646 May 29 12:42 cpbytes
11:     7  -rw-----.  1 wmackey users  1539 May 29 12:42 cpbytes.cpp
12:     8  -rw-----.  1 wmackey users     0 May 29 12:42 in.data
13: ::::::::::::::
14: 256
15: ::::::::::::::
16:     1  ^@^A^B^C^D^E^F^G^H^I
17:     2  ^K^L^M^N^O^P^Q^R^S^T^U^V^W^X^Y^Z^[^\^]^^^_
18:     3  !"#$%&'()*+,-./0123456789:;<=>?
19:     4  @ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_
20:     5  `abcdefghijklmnopqrstuvwxyz{|}~^?
21:     6  \x80\x81\x82\x83\x84\x85\x86\x87\x88\x89\x8A\x8B\x8C\x8D\x8E\x8F
\x90\x91\x92\x93\x94\x95\x96\x97\x98\x99\x9A\x9B\x9C\x9D\x9E\x9F
22:     7  ;ç£¤¥¦§¨©ª«¬®¯°±²³´µ¶·¸¹º»¼½¾¿
23:     8  ÀÁÂÃÄÅÆÇÈÉÊËÌÍÎÏÐÑÒÓÔÕÖ×ØÙÚÛÜÝÞß
```