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1.  /**
2.   * copy.c
3.   *
4.   * Computer Science 50
5.   * Problem Set 4
6.   *
7.   * Copies a BMP piece by piece, just because.
8.   */
9.
10. #include <stdio.h>
11. #include <stdlib.h>
12.
13. #include "bmp.h"
14.
15. int main(int argc, char* argv[])
16. {
17.     // ensure proper usage
18.     if (argc != 3)
19.     {
20.         printf("Usage: ./copy infile outfile\n");
21.         return 1;
22.     }
23.
24.     // remember filenames
25.     char* infile = argv[1];
26.     char* outfile = argv[2];
27.
28.     // open input file
29.     FILE* inptr = fopen(infile, "r");
30.     if (inptr == NULL)
31.     {
32.         printf("Could not open %s.\n", infile);
33.         return 2;
34.     }
35.
36.     // open output file
37.     FILE* outptr = fopen(outfile, "w");
38.     if (outptr == NULL)
39.     {
40.         fclose(inptr);
41.         fprintf(stderr, "Could not create %s.\n", outfile);
42.         return 3;
43.     }
44.
45.     // read infile's BITMAPFILEHEADER
46.     BITMAPFILEHEADER bf;
47.     fread(&bf, sizeof(BITMAPFILEHEADER), 1, inptr);
48.
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49. // read infile's BITMAPINFOHEADER
50. BITMAPINFOHEADER bi;
51. fread(&bi, sizeof(BITMAPINFOHEADER), 1, inptr);
52.
53. // ensure infile is (likely) a 24-bit uncompressed BMP 4.0
54. if (bf.bfType != 0x4d42 || bf.bfOffBits != 54 || bi.biSize != 40 ||
55.     bi.biBitCount != 24 || bi.biCompression != 0)
56. {
57.     fclose(outptr);
58.     fclose(inptr);
59.     fprintf(stderr, "Unsupported file format.\n");
60.     return 4;
61. }
62.
63. // write outfile's BITMAPFILEHEADER
64. fwrite(&bf, sizeof(BITMAPFILEHEADER), 1, outptr);
65.
66. // write outfile's BITMAPINFOHEADER
67. fwrite(&bi, sizeof(BITMAPINFOHEADER), 1, outptr);
68.
69. // determine padding for scanlines
70. int padding = (4 - (bi.biWidth * sizeof(RGBTRIPLE)) % 4) % 4;
71.
72. // iterate over infile's scanlines
73. for (int i = 0, biHeight = abs(bi.biHeight); i < biHeight; i++)
74. {
75.     // iterate over pixels in scanline
76.     for (int j = 0; j < bi.biWidth; j++)
77.     {
78.         // temporary storage
79.         RGBTRIPLE triple;
80.
81.         // read RGB triple from infile
82.         fread(&triple, sizeof(RGBTRIPLE), 1, inptr);
83.
84.         // write RGB triple to outfile
85.         if (triple.rgbtRed == 255)
86.         {
87.             triple.rgbtBlue = 255;
88.             triple.rgbtGreen = 255;
89.         }
90.         fwrite(&triple, sizeof(RGBTRIPLE), 1, outptr);
91.     }
92.
93.     // skip over padding, if any
94.     fseek(inptr, padding, SEEK_CUR);
95.
96.     // then add it back (to demonstrate how)
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97.         for (int k = 0; k < padding; k++)
98.         {
99.             fputc(0x00, outptr);
100.        }
101.    }
102.
103.    // close infile
104.    fclose(inptr);
105.
106.    // close outfile
107.    fclose(outptr);
108.
109.    // that's all folks
110.    return 0;
111. }
```