

```
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.   * Gonzalo de la Torre Amaya // A01610067
10.  * Tecnológico de Monterrey, SLP // CS50x
11.  */
12.
13.  #include <stdio.h>
14.  #include <stdlib.h>
15.
16.  #include "bmp.h"
17.
18.  int main(int argc, char* argv[])
19.  {
20.      // ensure proper usage
21.      if (argc != 3)
22.      {
23.          printf("Usage: ./copy infile outfile\n");
24.          return 1;
25.      }
26.
27.      // remember filenames
28.      char* infile = argv[1];
29.      char* outfile = argv[2];
30.
31.      // open input file
32.      FILE* inptr = fopen(infile, "r");
33.      if (inptr == NULL)
34.      {
35.          printf("Could not open %s.\n", infile);
36.          return 2;
37.      }
38.
39.      // open output file
40.      FILE* outptr = fopen(outfile, "w");
41.      if (outptr == NULL)
42.      {
43.          fclose(inptr);
44.          fprintf(stderr, "Could not create %s.\n", outfile);
45.          return 3;
46.      }
47.
48.      // read infile's BITMAPFILEHEADER
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49.     BITMAPFILEHEADER bf;
50.     fread(&bf, sizeof(BITMAPFILEHEADER), 1, inptr);
51.
52.     // read infile's BITMAPINFOHEADER
53.     BITMAPINFOHEADER bi;
54.     fread(&bi, sizeof(BITMAPINFOHEADER), 1, inptr);
55.
56.     // ensure infile is (likely) a 24-bit uncompressed BMP 4.0
57.     if (bf.bfType != 0x4d42 || bf.bfOffBits != 54 || bi.biSize != 40 ||
58.         bi.biBitCount != 24 || bi.biCompression != 0)
59.     {
60.         fclose(outptr);
61.         fclose(inptr);
62.         fprintf(stderr, "Unsupported file format.\n");
63.         return 4;
64.     }
65.
66.     // write outfile's BITMAPFILEHEADER
67.     fwrite(&bf, sizeof(BITMAPFILEHEADER), 1, outptr);
68.
69.     // write outfile's BITMAPINFOHEADER
70.     fwrite(&bi, sizeof(BITMAPINFOHEADER), 1, outptr);
71.
72.     // determine padding for scanlines
73.     int padding = (4 - (bi.biWidth * sizeof(RGBTRIPLE)) % 4) % 4;
74.
75.     // iterate over infile's scanlines
76.     for (int i = 0, biHeight = abs(bi.biHeight); i < biHeight; i++)
77.     {
78.         // iterate over pixels in scanline
79.         for (int j = 0; j < bi.biWidth; j++)
80.         {
81.             // temporary storage
82.             RGBTRIPLE triple;
83.
84.             // read RGB triple from infile
85.             fread(&triple, sizeof(RGBTRIPLE), 1, inptr);
86.
87.             if (triple.rgbtRed == 0xFF)
88.             {
89.                 triple.rgbtBlue = 0xff;
90.                 triple.rgbtGreen = 0xff;
91.             }
92.
93.             // write RGB triple to outfile
94.             fwrite(&triple, sizeof(RGBTRIPLE), 1, outptr);
95.         }
96.
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97.         // skip over padding, if any
98.         fseek(inptr, padding, SEEK_CUR);
99.
100.        // then add it back (to demonstrate how)
101.        for (int k = 0; k < padding; k++)
102.        {
103.            fputc(0x00, outptr);
104.        }
105.    }
106.
107.    // close infile
108.    fclose(inptr);
109.
110.    // close outfile
111.    fclose(outptr);
112.
113.    // that's all folks
114.    return 0;
115. }
```