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\* copy.c

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\* Computer Science 50

\* Problem Set 4

\*

\* Copies a BMP piece by piece, just because.

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#include <stdio.h>

#include <stdlib.h>

#include "bmp.h"

int main(int argc, char\* argv[])

{

// ensure proper usage

if (argc != 3)

{

printf("Usage: ./copy infile outfile\n");

return 1;

}

// remember filenames

char\* infile = argv[1];

char\* outfile = argv[2];

// open input file

FILE\* inptr = fopen(infile, "r");

if (inptr == NULL)

{

printf("Could not open %s.\n", infile);

return 2;

}

// open output file

FILE\* outptr = fopen(outfile, "w");

if (outptr == NULL)

{

fclose(inptr);

fprintf(stderr, "Could not create %s.\n", outfile);

return 3;

}

// read infile's BITMAPFILEHEADER

BITMAPFILEHEADER bf;

fread(&bf, sizeof(BITMAPFILEHEADER), 1, inptr);

// read infile's BITMAPINFOHEADER

BITMAPINFOHEADER bi;

fread(&bi, sizeof(BITMAPINFOHEADER), 1, inptr);

// ensure infile is (likely) a 24-bit uncompressed BMP 4.0

if (bf.bfType != 0x4d42 || bf.bfOffBits != 54 || bi.biSize != 40 ||

bi.biBitCount != 24 || bi.biCompression != 0)

{

fclose(outptr);

fclose(inptr);

fprintf(stderr, "Unsupported file format.\n");

return 4;

}

// write outfile's BITMAPFILEHEADER

fwrite(&bf, sizeof(BITMAPFILEHEADER), 1, outptr);

// write outfile's BITMAPINFOHEADER

fwrite(&bi, sizeof(BITMAPINFOHEADER), 1, outptr);

// determine padding for scanlines

int padding = (4 - (bi.biWidth \* sizeof(RGBTRIPLE)) % 4) % 4;

// iterate over infile's scanlines

for (int i = 0, biHeight = abs(bi.biHeight); i < biHeight; i++)

{

// iterate over pixels in scanline

for (int j = 0; j < bi.biWidth; j++)

{

// temporary storage

RGBTRIPLE triple;

// read RGB triple from infile

fread(&triple, sizeof(RGBTRIPLE), 1, inptr);

// write RGB triple to outfile

fwrite(&triple, sizeof(RGBTRIPLE), 1, outptr);

}

// skip over padding, if any

fseek(inptr, padding, SEEK\_CUR);

// then add it back (to demonstrate how)

for (int k = 0; k < padding; k++)

{

fputc(0x00, outptr);

}

}

// close infile

fclose(inptr);

// close outfile

fclose(outptr);

// that's all folks

return 0;

}