CS 3376.501 Assignment #2

Overview

Write a 'C' program that performs some functions of a file preprocessor.

This program should accept a –f option that specifies a filename to contain the output of the program. If the –f option is not specified, the program should send the output to standard output.

You must use freopen(…) to create the stream for the program's output if the output is going to standard output.

The program should accept zero or more arguments. If no arguments are specified, the program should get it's input from standard input. If one or more arguments are specified, the program should get its input from the files whose names are specified as arguments. If arguments are specified, the program should send to standard error the name of each file followed by the date/time the file was modified in the format YYYY_MM_DD_HH_MM_SS and then a trailing newline. For example, if the file named "file1.txt" was last modified on February 4, 2016 at 5:30 p.m., the program should send to standard error the following string:
"file1.txt 2015_02_04_17_30_00\n"

You must use getopt() to process the option and arguments.

Examples (assumes the program has been built as an executable named "preprocess"):

preprocess
Accepts input from standard input and sends processed output to standard output

preprocess –f outputfile.txt
Accepts input from standard input and sends processed output to a file called outputfile.txt

preprocess file1.txt file2.txt
Accepts input from file1.txt followed by file2.txt and sends the combined processed output to standard output. Also sends to standard error the name of each file and the last modified date/time as specified above.

preprocess –f outputfile.txt file1.txt file2.txt
Accepts input from file1.txt followed by file2.txt and sends the combined processed output to a file called outputfile.txt. Also sends to standard error the name of each file and the last modified date/time as specified above.

Processing

As the input is read, it is simply copied to the output, with two exceptions:

- If the string "#include" is found at the beginning of a line, it will be followed by a space then a filename in the form of <filename>". For example, you may see a line that begins with "#include <file3.txt>". If the input contains that at the beginning of the line, output the contents of file3.txt rather than the "#include <file3.txt>". The remainder of the line is ignored. If anything follows the <file3.txt> on the line it is ignored and processing begins on the next line.
- Anytime the string <time> is found in the input, replace <time> with the number of seconds elapsed since February 4, 2016 5:30 p.m.

Submission and Build Instructions

Submit to eLearning the *.c and *.h files necessary to build the program. It should build on cslinux1 with the command "gcc *.c".

Also submit a text file that describes the structure and function of the program. At least a page of text would be appropriate.

Due Date

The program is due by 11:59 p.m. on February 25.

Grading

The program will be graded as follows:
40% - program properly processing nominal input values
10% - program properly handles abnormal input files without crashing
20% - program is well structured, with clear program flow, without monolithic functions
20% - program is documented, describing the purpose of each function and variable, and describing the flow within the program. The identifiers are meaningful and consistent.
10% - the submitted text document describes the program structure.