

ECEEC-622: Introduction to Parallel Computer Architecture

Programming Assignment 1

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The assignment is due April 29, 2013. You may work on the assignment in teams of up to two people.

You have been provided with a program that takes as inputs a search string and a path name within the UNIX file system, and searches the files and directories that appear under this path name for the specified string. When a directory is encountered, the program searches all files (and sub directories) under this directory recursively. For example, if `work_crew` is the name of the program, then

```
./work_crew kandasamy /home/DREXEL
```

searches the UNIX file system starting from the `/home/DREXEL` directory for the string `kandasamy` and returns the number of occurrences of this string. This search functionality is provided by a single-threaded or serial implementation within the `search_for_string_serial()` function in the file `work_crew.c`. This assignment requires you to develop the `search_for_string_pthreads()` and `search_for_string_openmp()` functions in `work_crew.c` to implement a multi-threaded search functionality using `pthreads` and `OpenMP`. You may develop additional functions as necessary. The source files are available in a zip file called `source_files.zip`. Build the code as follows:

```
gcc -o work_crew work_crew.c queue_utils.c -std=c99
```

Email all the files needed to run your code including instructions on how to build the executable in a separate README file. Also, provide a report describing: (1) the design of your multi-threaded programs (use code or pseudocode to clarify the discussion); and (2) the speedup achieved over the serial version for 2, 4, 8, and 16 threads when searching for the string `kandasamy` starting from the path name `/home/DREXEL/nk78`. Limit the length of your report to up to five pages.