

CSE 344 – SYSTEMS PROGRAMMING HOMEWORK #6 REPORT

GÖKÇE NUR ERER 171044079

Problem Definition

In this assignment, I was expected to implement a directory copying utility called “pCp”, which creates a new thread to copy each file and sub-directory. This allows us to copy faster since multiple threads can finish the work faster than a single thread.

Problem Solution

To solve this problem we were expected to implement a worker thread pool. In a worker thread pool, a fixed number of threads handle the load.

So we were expected to implement a producer function and a consumer function so the threads can run these to copy the files.

Producer Code: Reads the directory and gets the file descriptors, and gets the name and puts it in to buffer for further consuming.

Consumer Code: Gets the items in the buffer and creates the copy of the file in the target directory.

Performance Issues

The best running case of this program is when the number of the consumer is equal to the buffer size and also equal to the number of the files to be copied.

The worst running case of this program is when the buffer size is 1 and there is only one consumer. This works same as the single threaded program.

One of the closest case to the best is the case where the buffer size is 1 but there are equal or more consumer threads than the number of files to be copied. Because there is only one item in the buffer and there are enough consumer threads to consume it fast enough.

```
gtuvirt@debian:~/shared/debshared/171044079_CSE344_HW6$ ./pCp 15 15 B Bc
=====
NAME          TYPE      SIZE
=====
FILE1         REG      5000192
FILE13        REG      5000192
FILE10        REG      5000192
FILE14        REG      5000192
FILE3         REG      5000192
FILE12        REG      5000192
FILE11        REG      5000192
FILE5         REG      5000192
FILE9         REG      5000192
FILE4         REG      5000192
FILE15        REG      5000192
FILE8         REG      5000192
FILE7         REG      5000192
FILE6         REG      5000192
FILE2         REG      5000192
Time Passed: 26.0 second(s)
Directories Copied: 1
Files Copied: 15
Bytes Copied: 75002880

gtuvirt@debian:~/shared/debshared/171044079_CSE344_HW6$ ./pCp 1 1 B Bc
=====
NAME          TYPE      SIZE
=====
FILE1         REG      5000192
FILE10        REG      5000192
FILE11        REG      5000192
FILE12        REG      5000192
FILE13        REG      5000192
FILE14        REG      5000192
FILE15        REG      5000192
FILE2         REG      5000192
FILE3         REG      5000192
FILE4         REG      5000192
FILE5         REG      5000192
FILE6         REG      5000192
FILE7         REG      5000192
FILE8         REG      5000192
FILE9         REG      5000192
Time Passed: 26.46 second(s)
Directories Copied: 1
Files Copied: 15
Bytes Copied: 75002880
```