

**CSE 344**

**Homework #5 Report**

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## Compile:

```
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/p
ut_your_codes_here$ make
gcc -Wall -Wextra -Werror -c 1901042681_main.c -o 1901042681_main.o
gcc -Wall -Wextra -Werror -o MWCp 1901042681_main.o
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/p
```

## Run:

```
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/p
ut_your_codes_here$ valgrind ./MWCp 10 4 ../testdir/src/libvterm/src ../toCopy
==131== Memcheck, a memory error detector
==131== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
```

## Clean:

```
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/p
ut_your_codes_here$ make clean
rm -f MWCp 1901042681_main.o
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/p
ut_your_codes_here$ |
```

## Additions to HW4:

```
pthread_barrier_t barrier;
```

- Global variable of barrier

```
pthread_cond_init(&barrier.not_full, NULL);
pthread_barrier_init(&barrier, NULL, num_workers); // Initialize the barrier
```

- Initialization of barrier. Specify the number of threads that must call **pthread\_barrier\_wait** before any of them successfully return from the call.

```
// Wait at the barrier
pthread_barrier_wait(&barrier);
```

- Wait in **worker\_thread**. It causes each worker thread to wait at the barrier until all worker threads have reached this point, ensuring that they all finish their current phase of processing.

```
pthread_barrier_destroy(&barrier); // Destroy the barrier
```

- Destroy the barrier once it is no longer needed, which is after all worker threads have completed their tasks at the end of the main.

The main effect of the barrier is to ensure that all worker threads complete file copying before any of them can proceed. This is useful to ensure all threads have completed a phase of processing before moving on to the next phase. The barrier helps coordinate the threads to wait for each other, ensuring they work in a more controlled and predictable manner.

The barrier is properly initialized and destroyed, ensuring no resource leaks related to thread synchronization mechanisms.

## Test cases:

- Sigint:

```
092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. donem/System Programming/HW5/hw4test/
here$ ./MWCp 10 4 ../testdir ../toCopy
dir/.github/ISSUE_TEMPLATE/bug_report.md to
^C
Copied ../testdir/runtime/ftplugin/sysctl.vim to ../toCopy/runtime/ftplugin/sysctl.vim
Copied ../testdir/runtime/ftplugin/systemd.vim to ../toCopy/runtime/ftplugin/systemd.vim

SIGINT received
Copied ../testdir/runtime/ftplugin/svg.vim to ../toCopy/runtime/ftplugin/svg.vim
Copied ../testdir/runtime/ftplugin/systemverilog.vim to ../toCopy/runtime/ftplugin/systemverilog.vim
Copied ../testdir/runtime/ftplugin/tcl.vim to ../toCopy/runtime/ftplugin/tcl.vim
Copied ../testdir/runtime/ftplugin/tcsh.vim to ../toCopy/runtime/ftplugin/tcsh.vim
Copied ../testdir/runtime/ftplugin/terminfo.vim to ../toCopy/runtime/ftplugin/terminfo.vim

-----STATISTICS-----
Consumers: 4 - Buffer Size: 10
Number of Regular Files: 651
Number of FIFO Files: 0
Number of Directories: 16
TOTAL BYTES COPIED: 10917150
TOTAL TIME: 00:00.640 (min:sec.mili)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. donem/System Programming/HW5/hw4test/
ut_your_codes_here$ |
```

- Sigint with valgrind:

```
AB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. donem/System Programming/HW5/hw4t
$ valgrind --leak-check=full --show-leak-kinds=all ./MWCp 10 4 ../testdir ../tocopy
a memory error detector

Copied ../testdir/runtime/ftplugin/vb.vim to ../tocopy/runtime/ftplugin/vb.vim
^CCopied ../testdir/runtime/ftplugin/verilog.vim to ../tocopy/runtime/ftplugin/verilog.vim
Copied ../testdir/runtime/ftplugin/udevrules.vim to ../tocopy/runtime/ftplugin/udevrules.vim
Copied ../testdir/runtime/ftplugin/updatedb.vim to ../tocopy/runtime/ftplugin/updatedb.vim

SIGINT received
Copied ../testdir/runtime/ftplugin/treetop.vim to ../tocopy/runtime/ftplugin/treetop.vim
Copied ../testdir/runtime/ftplugin/vhdl.vim to ../tocopy/runtime/ftplugin/vhdl.vim
Copied ../testdir/runtime/ftplugin/vim.vim to ../tocopy/runtime/ftplugin/vim.vim
Copied ../testdir/runtime/ftplugin/wast.vim to ../tocopy/runtime/ftplugin/wast.vim
Copied ../testdir/runtime/ftplugin/vroom.vim to ../tocopy/runtime/ftplugin/vroom.vim
Copied ../testdir/runtime/ftplugin/xf86conf.vim to ../tocopy/runtime/ftplugin/xf86conf.vim
Copied ../testdir/runtime/ftplugin/xhtml.vim to ../tocopy/runtime/ftplugin/xhtml.vim
Copied ../testdir/runtime/ftplugin/xdefaults.vim to ../tocopy/runtime/ftplugin/xdefaults.vim
Copied ../testdir/runtime/ftplugin/xinetd.vim to ../tocopy/runtime/ftplugin/xinetd.vim

-----STATISTICS-----
Consumers: 4 - Buffer Size: 10
Number of Regular Files: 670
Number of FIFO Files: 0
Number of Directories: 16
TOTAL BYTES COPIED: 10945237
TOTAL TIME: 00:00.928 (min:sec.mili)
==152==
==152== HEAP SUMMARY:
==152==   in use at exit: 0 bytes in 0 blocks
==152== total heap usage: 23 allocs, 23 frees, 563,328 bytes allocated
==152==
==152== All heap blocks were freed -- no leaks are possible
==152==
==152== For lists of detected and suppressed errors, rerun with: -s
==152== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. donem/System Programming/HW5/hw4t
```

- Test1:

```
AB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. done
$ valgrind ./MWCp 10 10 ../testdir/src/libvterm| ../tocopy
```

```

-----STATISTICS-----
Consumers: 10 - Buffer Size: 10
Number of Regular Files: 194
Number of FIFO Files: 0
Number of Directories: 7
TOTAL BYTES COPIED: 25009680
TOTAL TIME: 00:00.830 (min:sec.mili)
==158==
==158== HEAP SUMMARY:
==158==    in use at exit: 0 bytes in 0 blocks
==158==    total heap usage: 20 allocs, 20 frees, 269,616 bytes allocated
==158==
==158== All heap blocks were freed -- no leaks are possible
==158==
==158== For lists of detected and suppressed errors, rerun with: -s
==158== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2. donem/
ut_your_codes_here$

```

Test2:

```

AB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sınıf 2.
$ ./MWCp 10 4 ../testdir/src/libvterm/src ../toCopy

```

```

Copied ../testdir/src/libvterm/src/termScreen.c to ../toCopy/
Copied ../testdir/src/libvterm/src/unicode.c to ../toCopy/unc
Copied ../testdir/src/libvterm/src/utf8.h to ../toCopy/utf8.h
Copied ../testdir/src/libvterm/src/vterm.c to ../toCopy/vterm
Copied ../testdir/src/libvterm/src/vterm_internal.h to ../toC
Copied ../testdir/src/libvterm/src/state.c to ../toCopy/state
Copied ../testdir/src/libvterm/src/MRT10.pdf to ../toCopy/MRT
Copied ../testdir/src/libvterm/src/isl1551098739430.pdf to ..

```

```

-----STATISTICS-----
Consumers: 4 - Buffer Size: 10
Number of Regular Files: 140
Number of FIFO Files: 0
Number of Directories: 2
TOTAL BYTES COPIED: 24856698
TOTAL TIME: 00:00.136 (min:sec.mili)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf
ut_your_codes_here$

```

- Test3:

```
092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sinif 2. donem/Proje/valgrind$ ./MWCp 10 100 ../testdir| ../toCopy
```

```
Copied ../testdir/src/xpm/x64/lib/libXpm.a to ../toCopy/src/xpm/x64/lib/libXpm.a
Copied ../testdir/src/testdir/test_timers.vim to ../toCopy/src/testdir/test_timers.vim
Copied ../testdir/src/xpm_w32.c to ../toCopy/src/xpm_w32.c
Copied ../testdir/src/xpm_w32.h to ../toCopy/src/xpm_w32.h
Copied ../testdir/src/xxd/Makefile to ../toCopy/src/xxd/Makefile
Copied ../testdir/src/xxd/Make_amiga.mak to ../toCopy/src/xxd/Make_amiga.mak
Copied ../testdir/src/xxd/Make_ming.mak to ../toCopy/src/xxd/Make_ming.mak
Copied ../testdir/src/xxd/Make_mvc.mak to ../toCopy/src/xxd/Make_mvc.mak
Copied ../testdir/tools/rename.bat to ../toCopy/tools/rename.bat
Copied ../testdir/src/xpm/x86/lib-vc14/libXpm.lib to ../toCopy/src/xpm/x86/lib-vc14/libXpm.lib
Copied ../testdir/src/testdir/test_viminfo.vim to ../toCopy/src/testdir/test_viminfo.vim
Copied ../testdir/vimtutor.bat to ../toCopy/vimtutor.bat
Copied ../testdir/vimtutor.com to ../toCopy/vimtutor.com
```

-----STATISTICS-----

```
Consumers: 100 - Buffer Size: 10
Number of Regular Files: 3116
Number of FIFO Files: 0
Number of Directories: 151
TOTAL BYTES COPIED: 73254315
TOTAL TIME: 00:13.088 (min:sec.mili)
```

```
092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sinif 2. donem/Proje/valgrind$ ./MWCp 15 20 ../testdir/runtime ../tocopy
a memory error detector
```

- Test4:

```
092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sınıf/4. sinif 2. donem/Proje/valgrind$ valgrind ./MWCp 15 20 ../testdir/runtime ../tocopy
a memory error detector
```

```

Copied ../testdir/runtime/vimlogo.gif to ../tocopy/vimlogo.gif
Copied ../testdir/runtime/vim32x32.xpm to ../tocopy/vim32x32.xpm
Copied ../testdir/runtime/vim48x48.png to ../tocopy/vim48x48.png
Copied ../testdir/runtime/vimrc_example.vim to ../tocopy/vimrc_example.vim
Copied ../testdir/runtime/tutor/tutor.zh.euc to ../tocopy/tutor/tutor.zh.euc
Copied ../testdir/runtime/vim32x32.gif to ../tocopy/vim32x32.gif
Copied ../testdir/runtime/vim32x32.png to ../tocopy/vim32x32.png
Copied ../testdir/runtime/vim48x48.gif to ../tocopy/vim48x48.gif
Copied ../testdir/runtime/vimlogo.xpm to ../tocopy/vimlogo.xpm
Copied ../testdir/runtime/vimlogo.gif to ../tocopy/vimlogo.gif

-----STATISTICS-----
Consumers: 20 - Buffer Size: 15
Number of Regular Files: 1899
Number of FIFO Files: 0
Number of Directories: 98
TOTAL BYTES COPIED: 24826550
TOTAL TIME: 00:07.298 (min:sec.mili)
==278==
==278== HEAP SUMMARY:
==278==   in use at exit: 0 bytes in 0 blocks
==278== total heap usage: 121 allocs, 121 frees, 3,258,592 bytes allocated
==278==
==278== All heap blocks were freed -- no leaks are possible
==278==
==278== For lists of detected and suppressed errors, rerun with: -s
==278== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/put_your_codes_here$ |

```

## - Test 5:

```

TOTAL TIME: 00:00.015 (min:sec.mili)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/put_your_codes_here$ ./MwCp 10 100 ../testdir/nsis ../toCopy
Copied ../testdir/nsis/gvim.nsi to ../toCopy/gvim.nsi
Copied ../testdir/nsis/gvim_version.nsh to ../toCopy/gvim_version.nsh
Copied ../testdir/nsis/icons.zip to ../toCopy/icons.zip
Copied ../testdir/nsis/lang/danish.nsi to ../toCopy/lang/danish.nsi
Copied ../testdir/nsis/lang/dutch.nsi to ../toCopy/lang/dutch.nsi
Copied ../testdir/nsis/lang/english.nsi to ../toCopy/lang/english.nsi
Copied ../testdir/nsis/lang/german.nsi to ../toCopy/lang/german.nsi
Copied ../testdir/nsis/lang/italian.nsi to ../toCopy/lang/italian.nsi
Copied ../testdir/nsis/lang/simpchinese.nsi to ../toCopy/lang/simpchinese.nsi
Copied ../testdir/nsis/lang/tradchinese.nsi to ../toCopy/lang/tradchinese.nsi
Copied ../testdir/nsis/lang/japanese.nsi to ../toCopy/lang/japanese.nsi
Copied ../testdir/nsis/README.txt to ../toCopy/README.txt

-----STATISTICS-----
Consumers: 100 - Buffer Size: 10
Number of Regular Files: 12
Number of FIFO Files: 0
Number of Directories: 1
TOTAL BYTES COPIED: 244953
TOTAL TIME: 00:00.015 (min:sec.mili)
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/put_your_codes_here$ |

```

## - Error arguments:

```

berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/put_your_codes_here$ ./MwCp 15 20
Usage: ./MwCp <buffer_size> <num_workers> <source_dir> <dest_dir>
berry@DESKTOP-092GAB6:/mnt/c/Users/lafci/Desktop/GTU/4. sinif/4. sinif 2. donem/System Programming/HW5/hw4test/hw4test/put_your_codes_here$ |

```