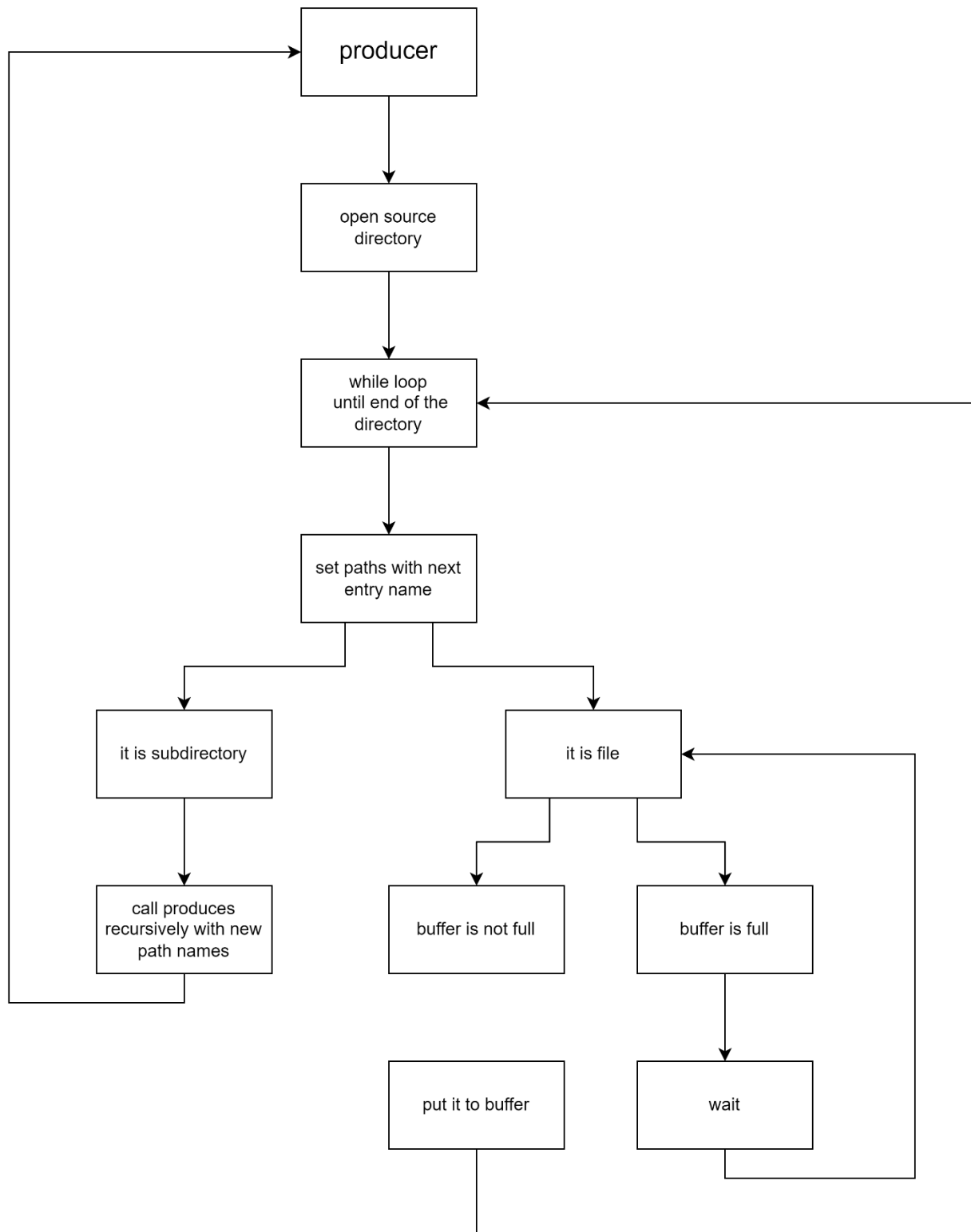




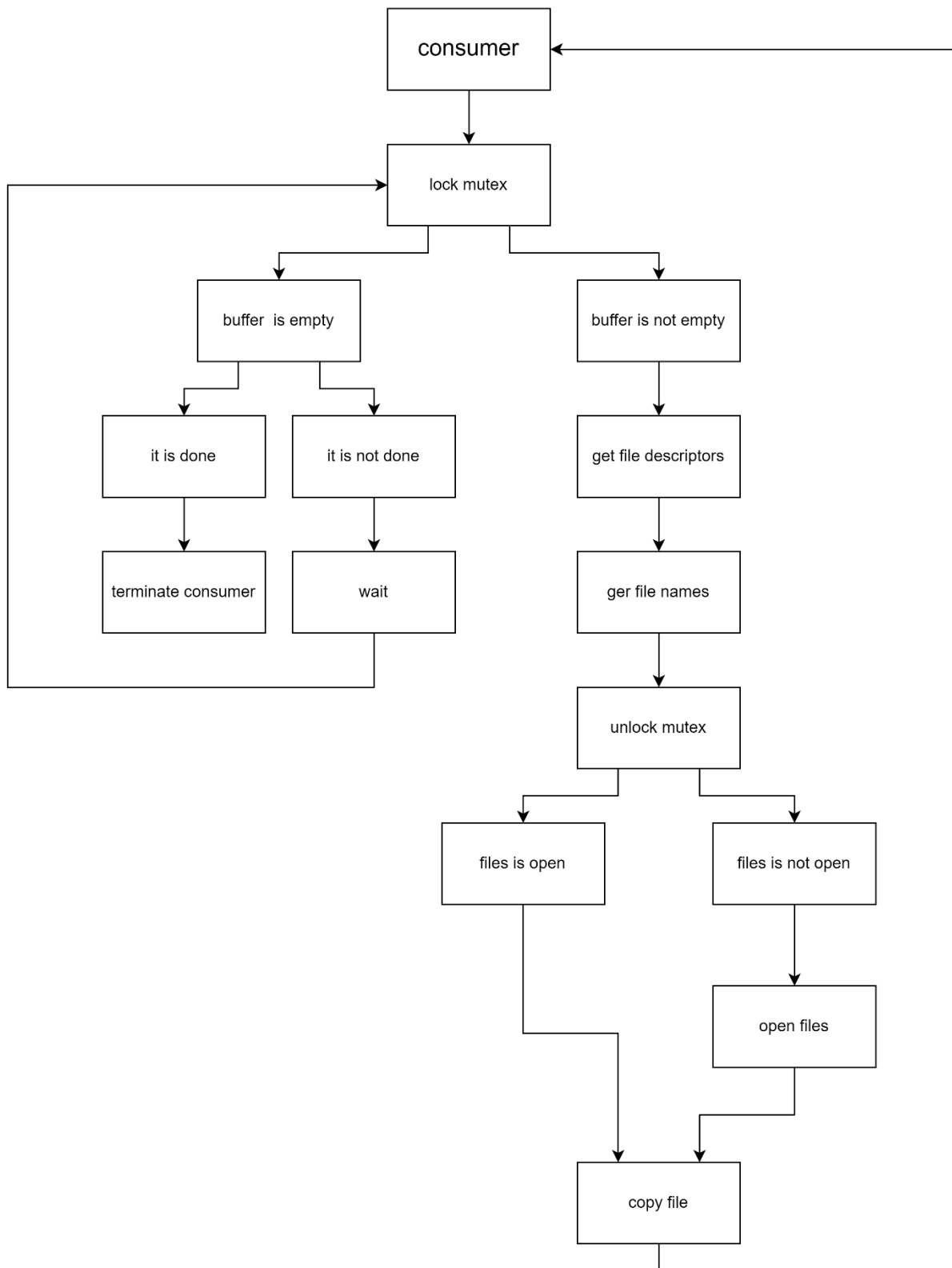
CSE344 HOMEWORK 5 REPORT

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SYSTEM ARCHITECTURE - PRODUCER



SYSTEM ARCHITECTURE – CONSUMER



OTHER SYSTEM ARCHITECTURE FEATURES

SIGNAL HANDLING

When SIGINT or SIGTERM has arrived, it closes all open file descriptors and free the buffer. And exits.

COPY FILE

Read until end of the file and write every byte to the destination file.

THREAD VARIABLES

BUFFER MUTEX

For control buffer access.

BUFFER NOT FULL CONDITION

Buffer control condition for producer to access.

BUFFER NOT EMPTY CONTITION

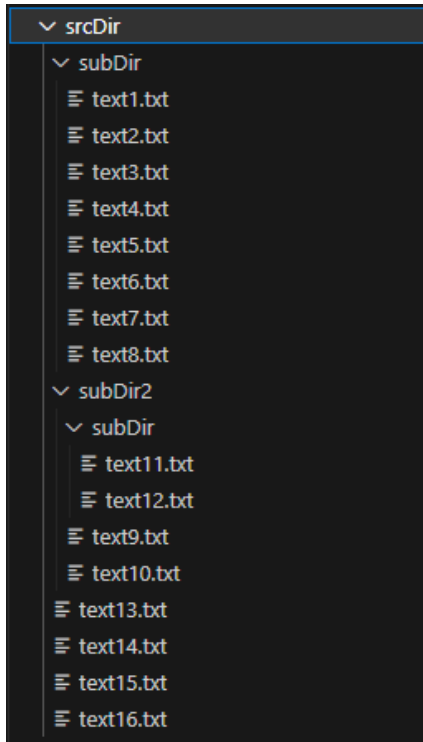
Buffer control condition for consumer to access.

WHICH REQUIREMENTS I MET

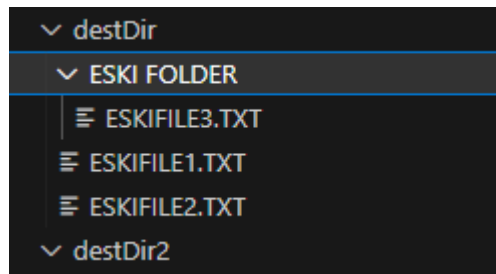
When I try to test with 2 subdirectory and additional files, because of the recursive function my program was just copying the first subdirectory and its files. When I use sleep function and make program to wait copying process, it is fixed. After a couple of tests, I noticed that when I use lock and unlock mutex in producer thread they occur the problem. I fix the problem when I fixed the places where these operations were made by making a small edit.

TESTING

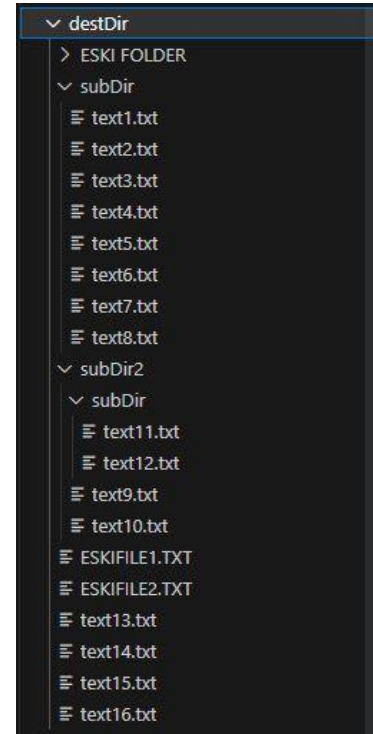
./HW5 10 5 SRCDIR DESTDIR



(src dir)



(dest dir - before)



(dest dir - after)

TESTING - ./HW5 10 5 SRCDIR DESTDIR

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir2/subDir/text12.txt
```

TESTING - ./HW5 10 5 SRCDIR DESTDIR

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

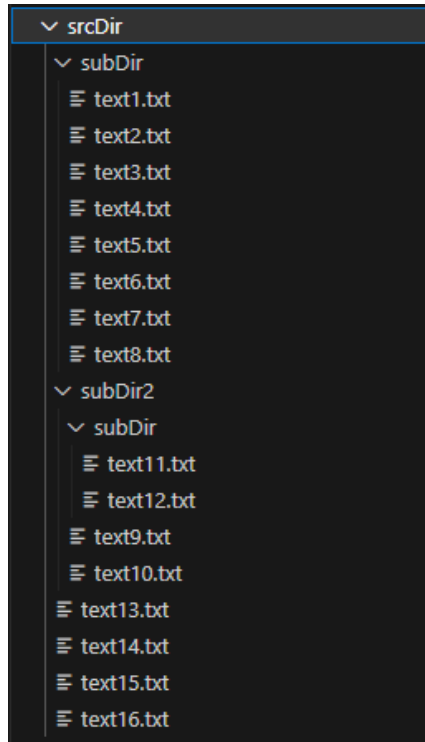
```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/text13.txt
Copied: destDir/subDir2/text9.txt
Copied: destDir/text14.txt
Copied: destDir/text15.txt
Copied: destDir/subDir2/text10.txt
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

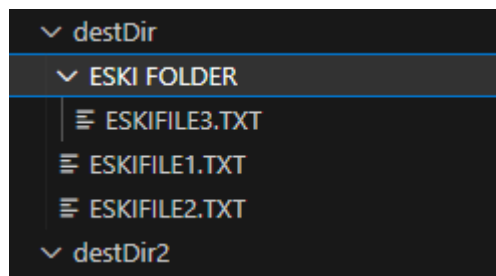
```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/text13.txt
Copied: destDir/subDir2/text9.txt
Copied: destDir/text14.txt
Copied: destDir/text15.txt
Copied: destDir/subDir2/text10.txt
Copied: destDir/text16.txt
Number of files copied: 16
Number of directories copied: 3
Total bytes copied: 0
Total execution time: 60.07 seconds
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5#
```


TESTING

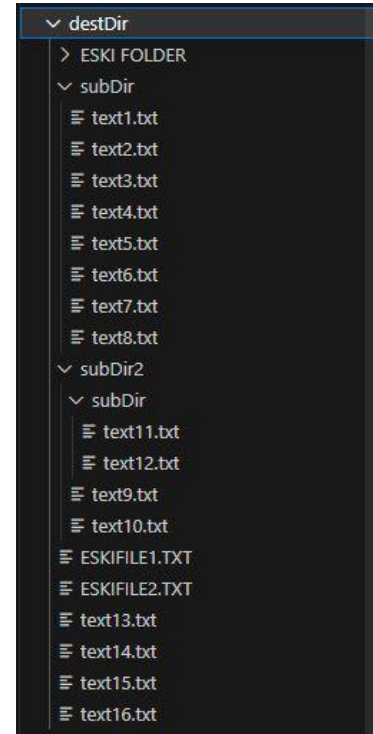
./HW5 10 3 SRCDIR DESTDIR



(src dir)



(dest dir - before)



(dest dir - after)

TESTING - ./HW5 10 3 SRCDIR DESTDIR

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
```

TESTING - ./HW5 10 3 SRCDIR DESTDIR

```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
```

```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir2/text10.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/subDir2/text9.txt
```

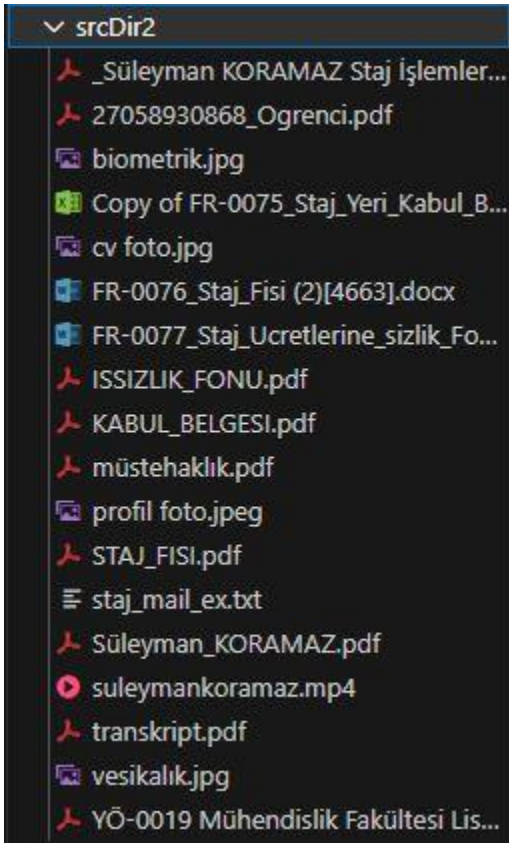
```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir2/text10.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/subDir2/text9.txt
Copied: destDir/text13.txt
Copied: destDir/text14.txt
Copied: destDir/text15.txt
```

TESTING - ./HW5 10 3 SRCDIR DESTDIR

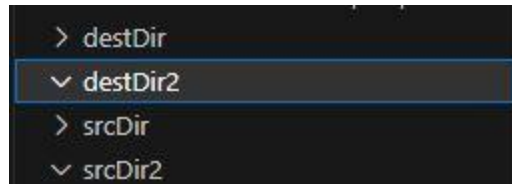
```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 3 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir2/text10.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/subDir2/text9.txt
Copied: destDir/text13.txt
Copied: destDir/text14.txt
Copied: destDir/text15.txt
Copied: destDir/text16.txt
Number of files copied: 16
Number of directories copied: 3
Total bytes copied: 0
Total execution time: 90.11 seconds
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5#
```

TESTING

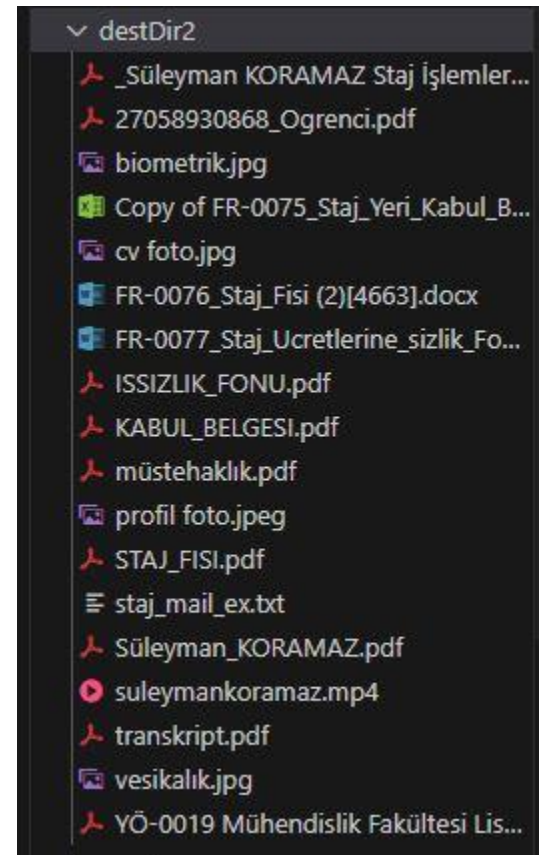
./HW5 10 5 SRCDIR2 DESTDIR2 (BIGFILE)



srcdir



destdir before



destdir after

TESTING - ./HW5 10 5 SRCDIR2 DESTDIR2 (BIG FILE)

```
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 5 srcDir2 destDir2
PRODUCER: srcDir2 - destDir2
Copied: destDir2/Copy of FR-0075_Staj_Yeri_Kabul_Belgesi (1) (1)(4662).xls
Copied: destDir2/27058930868_Ogrenci.pdf
Copied: destDir2/FR-0076_Staj_Fisi (2)[4663].docx
Copied: destDir2/biometrik.jpg
Copied: destDir2/cv_foto.jpg
Copied: destDir2/FR-0077_Staj_Ucretlerine_sizlik_Fonu_Katks_Formu (1) (1)[4664].docx
Copied: destDir2/müstehaklık.pdf
Copied: destDir2/profil_foto.jpeg
Copied: destDir2/ISSIZLIK_FONU.pdf
Copied: destDir2/KABUL_BELGESI.pdf
Copied: destDir2/staj_mail_ex.txt
Copied: destDir2/Süleyman KORAMAZ.pdf
Copied: destDir2/transkript.pdf
Copied: destDir2/STAJ_FISI.pdf
Copied: destDir2/vesikalık.jpg
Copied: destDir2/YÖ-0019 Mühendislik Fakültesi Lisans Eğitimi Staj Yönergesi R3-.pdf
Copied: destDir2/_Süleyman KORAMAZ Staj İşlemleri[4665].pdf
Copied: destDir2/suleymankoramaz.mp4
Number of files copied: 18
Number of directories copied: 0
Total bytes copied: 102810009
Total execution time: 8.35 seconds
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5#
```


TESTING – CONSUMER NUMBER IS BIGGER THAN BUFFER SIZE

./HW5 10 30 SRCDIR DESTDIR

```
PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 30 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
█

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 30 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
█

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# ./hw5 10 30 srcDir destDir
PRODUCER: srcDir - destDir
PRODUCER: srcDir/subDir - destDir/subDir
PRODUCER: srcDir/subDir2 - destDir/subDir2
PRODUCER: srcDir/subDir2/subDir - destDir/subDir2/subDir
Copied: destDir/subDir/text4.txt
Copied: destDir/subDir/text1.txt
Copied: destDir/subDir/text2.txt
Copied: destDir/subDir/text3.txt
Copied: destDir/subDir/text5.txt
Copied: destDir/subDir/text6.txt
Copied: destDir/subDir/text7.txt
Copied: destDir/subDir/text8.txt
Copied: destDir/subDir2/subDir/text11.txt
Copied: destDir/subDir2/text9.txt
Copied: destDir/subDir2/text10.txt
Copied: destDir/subDir2/subDir/text12.txt
Copied: destDir/text13.txt
Copied: destDir/text14.txt
Copied: destDir/text15.txt
Copied: destDir/text16.txt
Number of files copied: 16
Number of directories copied: 3
Total bytes copied: 0
Total execution time: 20.07 seconds
root@suleyman:/mnt/d/school/344_system_programming/hw/hw5# █
```

When there is 30 consumers but 10 buffer size, they waiting producer to fill buffer. But producer can just put 10 files to the buffer and consumers can process maximum 10 file each time. In this test, first time consumers take first 8 file and second part consumers take 8 more files. They can not process all 16 files at one time because there is not enough space in buffer for producer to put.