

**Gebze Technical University
Computer Engineering**

CSE 344 - 2021 Spring

HOMEWORK 4 REPORT

**BERKE SÜSLÜ
161044076**

1 INTRODUCTION

1.1 Problem Definition

Simple Covid-19 vaccination simulation with producer/consumer paradigm.

1.2 System Requirements

Any computer with Ubuntu 14.04 LTS 32-bit Operating System.

2 METHOD

2.1 Problem Solution Approach

Firstly, the program reads the parameters. If the parameters are invalid, the program exits. Then, the program reads the students file and counts the student size. Then create semaphores, a queue and parameters that the information of students. (quality, size, cost etc.)

H thread:

Reads the homework file and adds homework in the queue. When file ends or money is running out, the thread terminates.

Student threads:

The threads wait the main thread. When a student thread wakes up, it waits "6-Speed" seconds and wait the main thread again. When main thread flag is enabled, student threads finish their job and terminate.

Main thread:

After creating threads, the main thread reads the queue and selects the student according to priority of homework. It wakes the student thread and continues reading queue. When money is running out or H thread finished and queue is empty. Wakes the student threads which are waiting, print terminating messages and terminates.

NOTE: When the program freeing the allocated spaces with malloc, the program gives invalid pointer (core dumped) message when using 32 bit Ubuntu. Same code works well using 64 bit Ubuntu (or using another environment like valgrind or WSL). I couldn't solve the issue so I sent the 2 version of code, one without free() and with free() (the only difference is free-

ing allocated resources)

3 RESULT

3.1 Test Cases and Running Results

I used the example in the pdf file. Running examples(with free()):

```
≡ debug ×
≡ debug
1  H has a new homework C; remaining money is 10000TL
2  odtulu is waiting for a homework
3  bogazicili is waiting for a homework
4  H has a new homework S; remaining money is 10000TL
5  itulu is waiting for a homework
6  ytulu is waiting for a homework
7  sakaryali is chosen for solving homework C.Remaining money is 9850TL
8  bogazicili is chosen for solving homework S.Remaining money is 8850TL
9  sakaryali is waiting for a homework
10 sakaryali is solving homework in 4 seconds.
11 bogazicili is solving homework in 1 seconds.
12 H has a new homework Q; remaining money is 8850TL
13 odtulu is chosen for solving homework Q.Remaining money is 7950TL
14 H has a new homework C; remaining money is 7950TL
15 odtulu is solving homework in 3 seconds.
16 ytulu is chosen for solving homework C.Remaining money is 7300TL
17 H has a new homework S; remaining money is 7300TL
18 ytulu is solving homework in 2 seconds.
19 itulu is chosen for solving homework S.Remaining money is 6500TL
20 H has a new homework Q; remaining money is 6500TL
21 itulu is solving homework in 2 seconds.
22 H has a new homework C; remaining money is 6500TL
23 H has a new homework S; remaining money is 6500TL
24 H has a new homework Q; remaining money is 6500TL
25 H has a new homework C; remaining money is 6500TL
26 H has a new homework S; remaining money is 6500TL
27 H has a new homework C; remaining money is 6500TL
28 H has a new homework Q; remaining money is 6500TL
29 H has a new homework S; remaining money is 6500TL
30 H has a new homework C; remaining money is 6500TL
31 H has a new homework S; remaining money is 6500TL
32 H has a new homework S; remaining money is 6500TL
33 H has a new homework C; remaining money is 6500TL
34 H has a new homework Q; remaining money is 6500TL
35 H has a new homework S; remaining money is 6500TL
36 H has a new homework C; remaining money is 6500TL
37 H has a new homework Q; remaining money is 6500TL
```

≡ debug

```
73 bogazicili is waiting for a homework
74 bogazicili is chosen for solving homework S.Remaining money is 1150TL
75 bogazicili is solving homework in 1 seconds.
76 itulu is waiting for a homework
77 ytulu is waiting for a homework
78 sakaryali is waiting for a homework
79 sakaryali is chosen for solving homework C.Remaining money is 1000TL
80 itulu is chosen for solving homework Q.Remaining money is 200TL
81 sakaryali is solving homework in 4 seconds.
82 itulu is solving homework in 2 seconds.
83 bogazicili is waiting for a homework
84 itulu is waiting for a homework
85 odtulu is waiting for a homework
86 sakaryali is waiting for a homework
87 sakaryali is chosen for solving homework C.Remaining money is 50TL
88 sakaryali is solving homework in 4 seconds.
89 ytulu is done, terminating.
90 bogazicili is done, terminating.
91 itulu is done, terminating.
92 odtulu is done, terminating.
93 sakaryali is done, terminating.
94 Money is over, closing.
95 Homeworks solved and money made by the students:
96 odtulu 2 1800TL
97 bogazicili 4 4000TL
98 itulu 3 2400TL
99 ytulu 2 1300TL
100 sakaryali 3 450TL
101 Total cost for 14 homeworks 9950TL
102 Money left at H's account 50TL
103
```

Valgrind output with free():

```
==64==  
==64== HEAP SUMMARY:  
==64==    in use at exit: 0 bytes in 0 blocks  
==64==   total heap usage: 9 allocs, 9 frees, 11,812 bytes allocated  
==64==  
==64== All heap blocks were freed -- no leaks are possible  
==64==  
==64== For counts of detected and suppressed errors, rerun with: -v  
==64== Use --track-origins=yes to see where uninitialised values come from  
==64== ERROR SUMMARY: 6 errors from 2 contexts (suppressed: 0 from 0)  
madtracks@PC-MADTRACKS:/mnt/c/Users/MadTracks/Desktop/CSE344/HW4/HW4 with free$ valgrind ./hw4
```