Gebze Technical University
Computer Engineering

CSE 344 - 2021 Spring

HOMEWORK 4 REPORT

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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

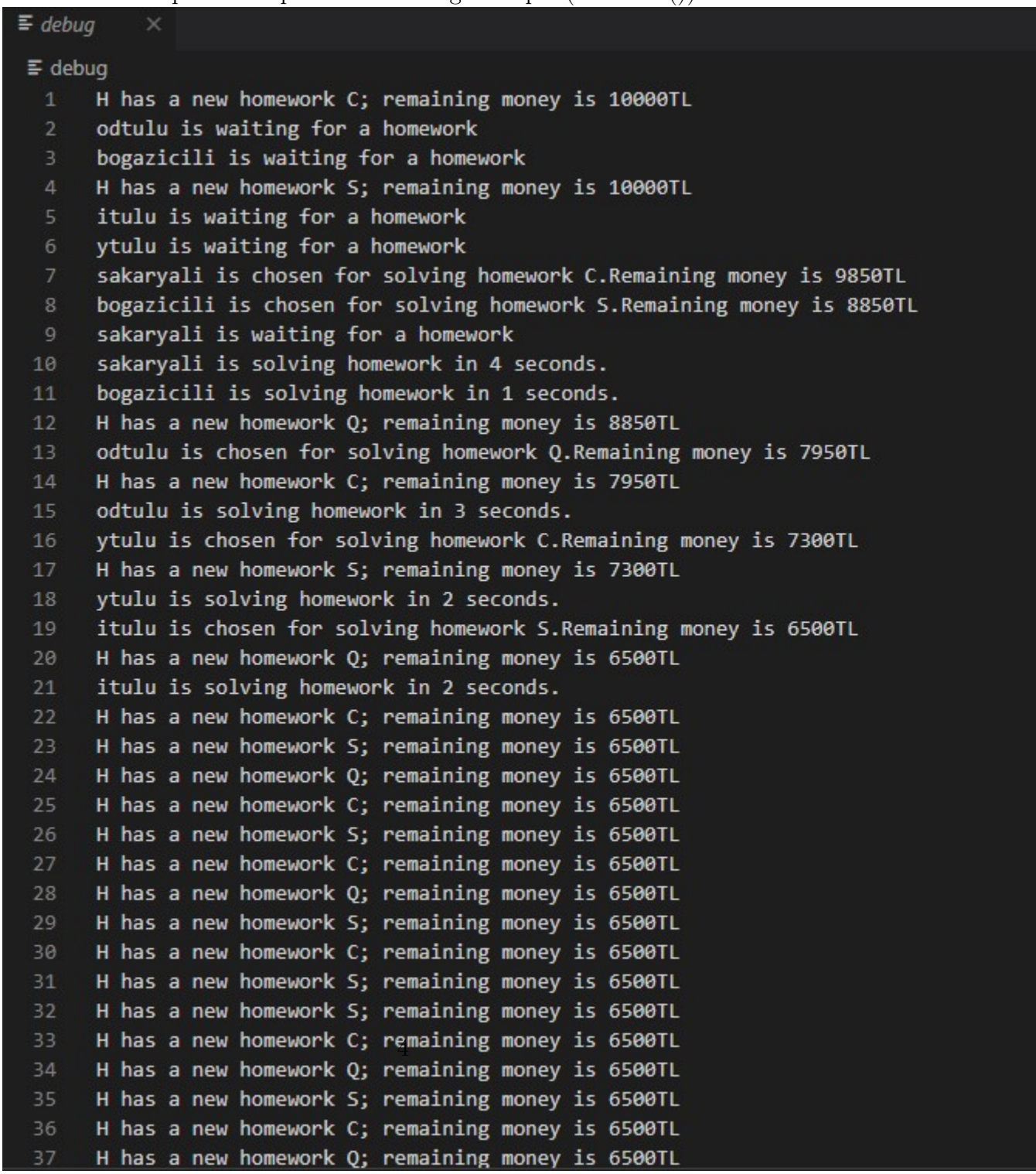
Firstly, the program reads the parameters.If the parameters are invalid, the program exits.Then, the program read the students file and counts the student size. Then create semaphores,a queue and parameters that the information of students.(quality,size,cost etc.)
H thread:
Reads the homework file and 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 finishes their job and terminates.
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

```
bogazicili is waiting for a homework
bogazicili is chosen for solving homework S.Remaining money is 1150TL
bogazicili is solving homework in 1 seconds.
itulu is waiting for a homework
ytulu is waiting for a homework
sakaryali is waiting for a homework
sakaryali is chosen for solving homework C.Remaining money is 1000TL
itulu is chosen for solving homework Q.Remaining money is 200TL
sakaryali is solving homework in 4 seconds.
itulu is solving homework in 2 seconds.
bogazicili is waiting for a homework
itulu is waiting for a homework
odtulu is waiting for a homework
sakaryali is waiting for a homework
sakaryali is chosen for solving homework C.Remaining money is 50TL
sakaryali is solving homework in 4 seconds.
ytulu is done, terminating.
bogazicili is done, terminating.
itulu is done, terminating.
odtulu is done, terminating.
sakaryali is done, terminating.
Money is over, closing.
Homeworks solved and money made by the students:
odtulu 2 1800TL
bogazicili 4 4000TL
itulu 3 2400TL
ytulu 2 1300TL
sakaryali 3 450TL
Total cost for 14 homeworks 9950TL
Money left at H's account 50TL
```

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
```