

Gebze Technical University

Department Of Computer Engineering

CSE 312 /CSE 504 Spring 2022

Operating Systems

Homework #02

Due Date: 14.06.2022

1. Before you start the homework

Before you start the homework, you should firstly watch [the 16th video](#), and then download its source code into your virtual machine, as I explained in the first homework. If you have any questions about this video, please ask in the problem session as soon as possible.

If you didn't do your first homework, please use the best 1st homework that I shared with you on Teams.

2. Your task for the homework

Your task is to design page replacement algorithms for the operating system. Your operating system should give the opportunity to replace the given page list (with their page number) into the given number of frames that can be in memory at a time per process. Your operating system should have the following page replacement algorithms so the user can select one of them:

- FIFO (First-In-First-Out)
- Second Chance
- LRU (Least Recently Used)

3. Your program to run during tests

You will implement and run simple integer sorting algorithms including

- Bubble sort
- Quick sort
- Insertion sort

Your sorting program will take parameters

- Array size with respect to physical memory size (For example, size of 2.0 means 2 times the size of the physical memory, and 0.5 means half the size of the physical memory)
- The algorithm to sort
- If the initial array is random or sorted

4. Output of the homework

Your OS should keep statistics about the page replacement algorithms, such as

- The number of hits and hit rate per second
- The number of misses and miss rate per second
- The number of pages loaded
- The number of pages written back to the disk
- Any other information that might be useful

You should report the above table for each second of the program run and also for the whole program at the end of the program

5. General rules for homework

- It is not a group project. Do not share your answers to anyone in any circumstance. Any cheating means at least –100 for both sides.
- NO DEADLINE EXTENSION.**
- Your homework report is important, it should include your design decisions, your main structure, your algorithms, etc.
- For any questions about the homework, write on Teams chat to Gizem Süngü.

- e. Your code is responsible for checking any obvious exceptions and avoiding any possible deadlock situations. The homework is not responsible for warning you about all kinds of errors or exceptions.
- f. Write comments on the lines of your code where any critical actions happen.
- g. The names of your source files and how to install them into the homework submission page will be announced. You are responsible for following all announcements on the Teams page.
- h. After the deadline, you are responsible for explaining your project to the course assistant in a demonstration.
 - i. Each demo will be done in 10 minutes.
 - ii. Many appointments will be open so you can select the most available time slot for yourself.
 - iii. The last 3 days before the demos are started, the appointment list will not be available.
 - iv. In order to answer all possible questions, you need to command your code. The solution is to write and to do everything on your own. Your homework grade will be evaluated by your answers.