

COMP 304: Project 3

Virtual Memory Manager and File System in Unix

Due: May 27th, midnight - Firm Deadline - No Extension

Notes: The project can be done **individually or teams of 2**. You may discuss the problems with other teams and post questions to the OS discussion forum but the submitted work must be your own work. This assignment is worth 10% of your total grade.

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Description

In this project, you will get more familiar with the concepts of virtual memory and file system in Unix.

Part I

(70 points) In this part, you will implement both FIFO and LRU replacement policies for a virtual memory. The provided code in the project folder implements a virtual memory manager as described in Programming Projects in **page 447 in Chapter 9**. (in Page 458 in Chapter 9 in the online version of the book, also provided in blackboard). The implementation assumes that physical memory is the same size as the virtual address space. In practice, physical memory is typically much smaller than a virtual address space.

Your implementation will use **64 page frames rather than 256 for physical memory**. This change will require modifying the provided program so that it keeps track of **free page frames as well as implementing a page-replacement policy**. We are asking you to implement both **FIFO** and **LRU** replacement policies. Add a command line argument to select a policy such as -p 0 for FIFO and -p 1 for LRU.

Compare these two policies with the address streams provided in the project folder.

Part II

(20 points) Perform the programming problem in page **534** in Chapter 11 (if you have the online version of the book, then it is in page **583** in Chapter 12). If you do not have the book, we have provided the related pages on blackboard and necessary input files.

This part of the project does not require you to implement any program. Instead you have to run some commands to get familiar with the file system in Unix. Perform the commands

and prepare a report answering the questions in the text book. Include snapshots of your runs.

Deliverables

You are required to submit the followings packed in a zip file (named your-username(s).zip) to blackboard :

- .c source file that implements the virtual memory manager. Please comment your implementation.
- Any supplementary files for your implementation (e.g. Makefile)
- Submit a report describing your implementation and answers to the questions in Part II.
- There won't be a demo for this project. We suggest you to document your project very well to make things easy for the TA and for yourself.

Grading

Part I (70 points), Part II (20 points), Report (10 points).

GOOD LUCK.