**Kennesaw State University**

**College of Computing and Software Engineering**

**DEPARTMENT OF COMPUTER SCIENCE**

**CS 3502 / Operating Systems / Section 01**

**Assignment 5**

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**Summary and Purpose of the Assignment**

The purpose of this assignment is to study static page replacement in virtual memory management. As well the models allow the observation of general behavior of a system with page replacement and allow computation of some relevant performance metrics.

**Results**

fifopgrep default

Simulation of FIFO Page Replacement

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Psim3 project: FIFO Page Replacement

Simulation date: Mon Oct 23 12:40:33 2017

FIFO - Total page faults: 175

Total number of page references: 257

Proportion of pg faults to pg refs.: 0.680934

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End of simulation FIFO Page Replacement Mon Oct 23 12:40:33 2017

fifopgrep meanpg100

Simulation of FIFO Page Replacement

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Psim3 project: FIFO Page Replacement

Simulation date: Mon Oct 23 12:56:54 2017

FIFO - Total page faults: 174

Total number of page references: 262

Proportion of pg faults to pg refs.: 0.664122

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End of simulation FIFO Page Replacement Mon Oct 23 12:56:54 2017

lrupgrep default

Psim3 project: LRU Page Replacement Algorithm

Simulation date: Tue Oct 24 12:08:03 2017

LRU - Total page faults: 212

Total number of page references: 300

Proportion of pg faults to pg refs.: 0.706667

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End of simulation LRU Page Replacement Algorithm Tue Oct 24 12:08:03 2017

lrupgrep meanpg100

Psim3 project: LRU Page Replacement Algorithm

Simulation date: Tue Oct 24 12:09:39 2017

LRU - Total page faults: 206

Total number of page references: 300

Proportion of pg faults to pg refs.: 0.686667

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End of simulation LRU Page Replacement Algorithm Tue Oct 24 12:09:39 2017

optpgrep default

Simulation of Optimal Page Replacement

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Psim3 project: Optimal Page Replacement Algorithm

Simulation date: Tue Oct 24 12:13:04 2017

Optimal - Total page faults: 120

Total number of page references: 300

Proportion of pg faults to pg refs.: 0.4

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End of simulation Optimal Page Replacement Algorithm Tue Oct 24 12:13:04 2017

optpgrep meanpg100

Simulation of Optimal Page Replacement

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Psim3 project: Optimal Page Replacement Algorithm

Simulation date: Tue Oct 24 12:11:20 2017

Optimal - Total page faults: 117

Total number of page references: 300

Proportion of pg faults to pg refs.: 0.39

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End of simulation Optimal Page Replacement Algorithm Tue Oct 24 12:11:20 2017

**Conclusion**

In conclusion I have learned more about page references and the inner workings of physical and virtual memory management. I also gained a better understanding of using NANO as it seems there was a call to a wrong variable in both lrupgrep.cpp and optpgrep.cpp that needed to be fixed before the model would run correctly.

**Assignment Questions**

1. What aspect of an operating system is the model representing?
   * The model represents virtual memory and memory management.
2. What performance measures does the model compute?
   * It computes the throughput performance of physical and virtual memory
3. What is noticeable in the dynamic behavior shown in the model?
   * The dynamic behavior is influenced by the mean\_pg variable and the cvar variable. Changing the cvar increases the range of variance while changing the mean\_pg shifts the variance up or down. In the FIFO simulation by increasing mean\_pg you see a decrease in page faults, however in the LRU model decreasing mean\_pg decreases the number of page faults.