Project Report
Virtual Memory Manager

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1 Running the code

This program will run 4 different page replacement algorithms and 2 different frame allocation policies on two trace files.

To build the program for local allocation:
`make build-local`

To build the program for global allocation:
`make build-global`

To run the program for local allocation:
`make run-local PAGESIZE=(page-size) FRAMES=(number-of-frames) FILE=(path-to-trace-file) POLICY=(replacement-policy)`

To run the program for global allocation:
`make run-global PAGESIZE=(page-size) FRAMES=(number-of-frames) FILE=(path-to-trace-file) POLICY=(replacement-policy)`

The following are four replacement policies implemented in the code:

- fifo
- lru
- random
- optimal

2 Observations

We got the following results for a fixed page size of 4096 bytes (4KB), with varying replacement policies, allocation policies, and number of frames.

We observe that increasing the number of frames decreases the page faults.

Local allocation has, on average, more faults than global allocation.

Order of faults for replacement policies:

$$Random > FIFO > LRU > Optimal$$

Below are graphical results for the same.

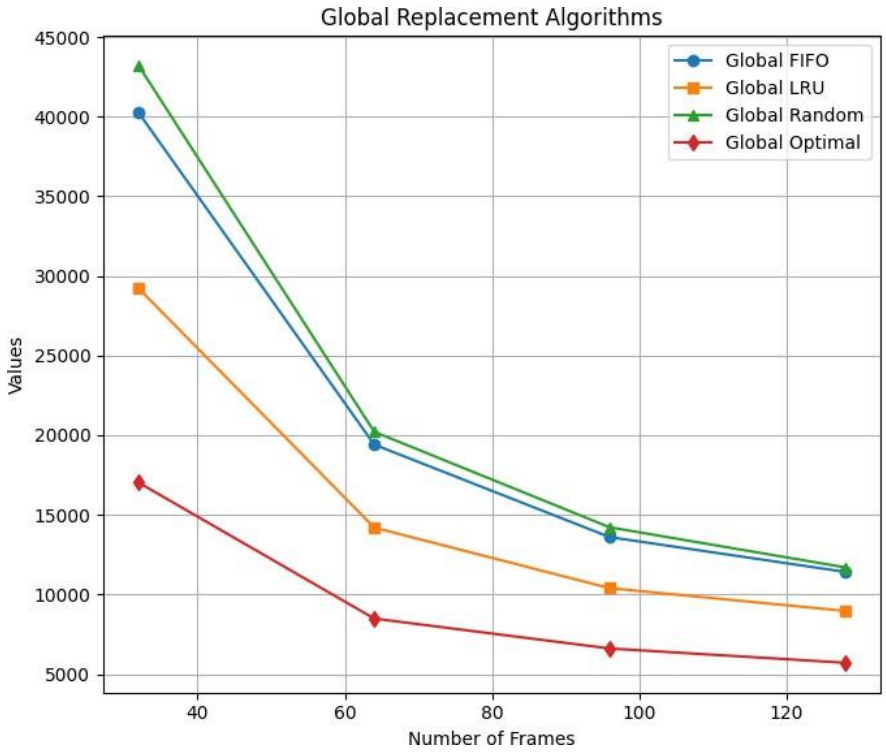

Figure 1: Page Faults vs No. of Frames for different Replacement Algorithms using Global Allocation

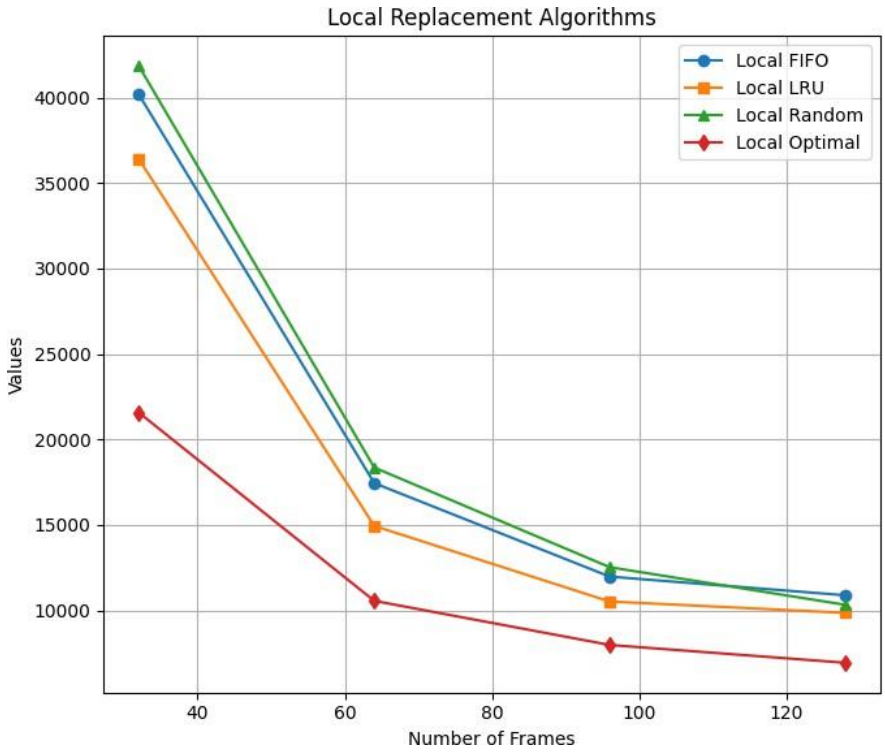

Figure 2: Page Faults vs No. of Frames for different Replacement Algorithms using Local Allocation