Quiz: Page Replacement

Total points 60/60

Take the quiz solo, but feel free to consult a partner student, the book, the videos or other resources if needed. Re-take quiz if your score is less than 80% or if you just want some more practice.

The respondent's email (**faiyaz@pdx.edu**) was recorded on submission of this form.

Page Replacement Simulation

Consider the following page reference string.

A,B,C,D,A,B,B,A,C,D,B,A

Assume that there are 3 available empty page frames in physical memory and that all three page frames are empty.

Simulate these different page replacement algorithms (FIFO, LRU and OPT) and give your results below.

✓ For OPT, how many page faults? * 5/5

- ○ 10
- ○ 4
- ◉ 6 ✓
- ○ 9

✓ For OPT, which pages remain in memory at the end? * 5/5

- ○ A,C,D
- ○ B,C,D
- ◉ A,B,D ✓
- ○ A,B,C

✓ For FIFO, how many page faults? * 5/5

- ○ 4
- ○ 6
- ◉ 9 ✓
- ○ 10

✓ For FIFO, which pages remain in memory at the end? * 5/5

- ○ A,B,C
- ◉ A,C,D ✓
- ○ B,C,D
- ○ A,B,D

✓ For LRU, how many page faults? * 5/5

- (●) 10 ✓
- ( ) 9
- ( ) 4
- ( ) 6

✓ For LRU, which pages remain in memory at the end? * 5/5

- ( ) A,B,C
- ( ) A,C,D
- ( ) B,C,D
- (●) A,B,D ✓

✓ The _____ linux command can be used to trace the details of of a process's memory references. *5/5

- ( ) pmap
- ( ) free
- (●) valgrind ✓
- ( ) vmstat

✓ An OS executes its page replacement algorithm while handling page faults. *5/5

- (●) True ✓
- ( ) False

✓ Why doesn't Linux implement the OPT algorithm? * 5/5

- ( ) OPT causes application programs to be more difficult to design and implement
- (●) can't know the future page references of a program ✓
- ( ) because Linus Torvalds is Benevolent Dictator for Life
- ( ) it opens unacceptable security holes

✓ What is Temporal Locality? * 5/5

- ( ) accesses to addresses are usually followed by accesses to nearby addresses
- (●) that which was accessed recently will be accessed again soon ✓
- ( ) the memory hierarchy of a computer is extremely important for application performance
- ( ) reads occur more frequently than writes

✓ Why might the OS maintain a few extra empty physical frames, even when all of physical memory is used/needed? *5/5

- ○ to reduce the average number of disk accesses per page fault
- ◉ so that new page references (compulsory or capacity misses) can be serviced immediately with an empty frame. ✓
- ○ to improve locality of reference
- ○ to maximize the number of physical page frames allocated to high priority processes

✓ By measuring page fault frequency of a process an OS can improve its estimation of how many physical page frames to allocate to a process. *5/5

- ◉ True ✓
- ○ False