PROJECT 3 REPORT

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COURSE CODE: CS342 : OPERATING SYSTEM

INPUT 1 : (LOW AMOUNT OF SAME ADDRESSES)

r 0x0000
w 0x0001
w 0x0002 0x51
r 0x2003
w 0x2104 0xac
r 0x1205
r 0x0000
r 0x3d27
w 0x3328

```
r 0x2429
r 0xaa29
r 0xab29
w 0xab29
r 0xab21
r 0x1205
r 0x1234
w 0x0021
w 0x4202 0x5
r 0x2034
w 0x2104 0x23
w 0x1205
w 0x0320
w 0x3d21
w 0x1228
r 0x1429
r 0x1129
r 0x1119
w 0x2b29
r 0x2121
r 0x2205
r 0x0000
w 0xbf01
w 0x4302 0x29
```

r 0x2703

w 0xaaaa 0xfa

r 0xbbbb

r 0xabcd

r 0xeffe

w 0xefab 0x11

r 0xfefe

r 0x8c0a

r 0x1183

w 0xab29 0xb4

r 0xab21

r 0x1902

CLOCK OUTPUT(4 frames)(32pf)

0x0000 0x0 0x0 0x0 0x0 0x56510e84b890

0x0001 0x0 0x0 0x1 0x0 0x56510e84b890

0x0002 0x0 0x0 0x2 0x0 0x56510e84b890

0x2003 0x80 0x0 0x3 0x1 0x56510e84b8d0

0x2104 0x84 0x0 0x4 0x2 0x56510e84b910

0x1205 0x48 0x0 0x5 0x3 0x56510e84b950

0x0000 0x0 0x0 0x0 0x0 0x56510e84b890

0x3d27 0xf4 0x0 0x27 0x0 0x56510e84b890 pgfault

0x3328 0xcc 0x0 0x28 0x1 0x56510e84b8d0 pgfault

0x2429 0x90 0x0 0x29 0x2 0x56510e84b910 pgfault
0xaa29 0x2a8 0x0 0x29 0x3 0x56510e84b950
pgfault
0xab29 0x2ac 0x0 0x29 0x0 0x56510e84b890
pgfault
0xab29 0x2ac 0x0 0x29 0x0 0x56510e84b890
0xab21 0x2ac 0x0 0x21 0x0 0x56510e84b890
0x1205 0x48 0x0 0x5 0x1 0x56510e84b8d0 pgfault
0x1234 0x48 0x0 0x34 0x1 0x56510e84b8d0
0x0021 0x0 0x0 0x21 0x2 0x56510e84b910 pgfault
0x4202 0x108 0x0 0x2 0x3 0x56510e84b950 pgfault
0x2034 0x80 0x0 0x34 0x0 0x56510e84b890 pgfault
0x2104 0x84 0x0 0x4 0x1 0x56510e84b8d0 pgfault
0x1205 0x48 0x0 0x5 0x2 0x56510e84b910 pgfault
0x0320 0xc 0x0 0x20 0x3 0x56510e84b950 pgfault
0x3d21 0xf4 0x0 0x21 0x0 0x56510e84b890 pgfault
0x1228 0x48 0x0 0x28 0x2 0x56510e84b910
0x1429 0x50 0x0 0x29 0x1 0x56510e84b8d0 pgfault
0x1129 0x44 0x0 0x29 0x2 0x56510e84b910 pgfault
0x1119 0x44 0x0 0x19 0x2 0x56510e84b910
0x2b29 0xac 0x0 0x29 0x3 0x56510e84b950 pgfault
0x2121 0x84 0x0 0x21 0x0 0x56510e84b890 pgfault
0x2205 0x88 0x0 0x5 0x1 0x56510e84b8d0 pgfault
0x0000 0x0 0x0 0x0 0x2 0x56510e84b910 pgfault

0xbf01 0x2fc 0x0 0x1 0x3 0x56510e84b950 pgfault
0x4302 0x10c 0x0 0x2 0x0 0x56510e84b890 pgfault
0x2703 0x9c 0x0 0x3 0x1 0x56510e84b8d0 pgfault
0xaaaa 0x2aa 0x0 0x2a 0x2 0x56510e84b910 pgfault
0xbbbb 0x2ee 0x0 0x3b 0x3 0x56510e84b950 pgfault
0xabcd 0x2af 0x0 0xd 0x0 0x56510e84b890 pgfault
0xeffe 0x3bf 0x0 0x3e 0x1 0x56510e84b8d0 pgfault
0xefab 0x3be 0x0 0x2b 0x2 0x56510e84b910 pgfault
0xfefe 0x3fb 0x0 0x3e 0x3 0x56510e84b950 pgfault
0x8c0a 0x230 0x0 0xa 0x0 0x56510e84b890 pgfault
0x1183 0x46 0x0 0x3 0x1 0x56510e84b8d0 pgfault
0xab29 0x2ac 0x0 0x29 0x2 0x56510e84b910 pgfault
0xab21 0x2ac 0x0 0x21 0x2 0x56510e84b910
0x1902 0x64 0x0 0x2 0x3 0x56510e84b950 pgfault

FIFO OUTPUT(4 frames)(32pf)

0x0000 0x0 0x0 0x0 0x0 0x5644e3c9b890
0x0001 0x0 0x0 0x1 0x0 0x5644e3c9b890
0x0002 0x0 0x0 0x2 0x0 0x5644e3c9b890

0x2003 0x80 0x0 0x3 0x1 0x5644e3c9b8d0

0x2104 0x84 0x0 0x4 0x2 0x5644e3c9b910

0x1205 0x48 0x0 0x5 0x3 0x5644e3c9b950

0x0000 0x0 0x0 0x0 0x0 0x5644e3c9b890

0x3d27 0xf4 0x0 0x27 0x0 0x5644e3c9b890 pgfault

0x3328 0xcc 0x0 0x28 0x1 0x5644e3c9b8d0 pgfault

0x2429 0x90 0x0 0x29 0x2 0x5644e3c9b910 pgfault

0xaa29 0x2a8 0x0 0x29 0x3 0x5644e3c9b950
pgfault

0xab29 0x2ac 0x0 0x29 0x0 0x5644e3c9b890
pgfault

0xab29 0x2ac 0x0 0x29 0x0 0x5644e3c9b890

0xab21 0x2ac 0x0 0x21 0x0 0x5644e3c9b890

0x1205 0x48 0x0 0x5 0x1 0x5644e3c9b8d0 pgfault

0x1234 0x48 0x0 0x34 0x1 0x5644e3c9b8d0

0x0021 0x0 0x0 0x21 0x2 0x5644e3c9b910 pgfault

0x4202 0x108 0x0 0x2 0x3 0x5644e3c9b950 pgfault

0x2034 0x80 0x0 0x34 0x0 0x5644e3c9b890 pgfault

0x2104 0x84 0x0 0x4 0x1 0x5644e3c9b8d0 pgfault

0x1205 0x48 0x0 0x5 0x2 0x5644e3c9b910 pgfault

0x0320 0xc 0x0 0x20 0x3 0x5644e3c9b950 pgfault

0x3d21 0xf4 0x0 0x21 0x0 0x5644e3c9b890 pgfault

0x1228 0x48 0x0 0x28 0x2 0x5644e3c9b910

0x1429 0x50 0x0 0x29 0x1 0x5644e3c9b8d0 pgfault

0x1129 0x44 0x0 0x29 0x2 0x5644e3c9b910 pgfault
0x1119 0x44 0x0 0x19 0x2 0x5644e3c9b910
0x2b29 0xac 0x0 0x29 0x3 0x5644e3c9b950 pgfault
0x2121 0x84 0x0 0x21 0x0 0x5644e3c9b890 pgfault
0x2205 0x88 0x0 0x5 0x1 0x5644e3c9b8d0 pgfault
0x0000 0x0 0x0 0x0 0x2 0x5644e3c9b910 pgfault
0xbf01 0x2fc 0x0 0x1 0x3 0x5644e3c9b950 pgfault
0x4302 0x10c 0x0 0x2 0x0 0x5644e3c9b890 pgfault
0x2703 0x9c 0x0 0x3 0x1 0x5644e3c9b8d0 pgfault
0xaaaa 0x2aa 0x0 0x2a 0x2 0x5644e3c9b910
pgfault
0xbbbb 0x2ee 0x0 0x3b 0x3 0x5644e3c9b950
pgfault
0xabcd 0x2af 0x0 0xd 0x0 0x5644e3c9b890 pgfault
0xeffe 0x3bf 0x0 0x3e 0x1 0x5644e3c9b8d0 pgfault
0xefab 0x3be 0x0 0x2b 0x2 0x5644e3c9b910
pgfault
0xfefe 0x3fb 0x0 0x3e 0x3 0x5644e3c9b950 pgfault
0x8c0a 0x230 0x0 0xa 0x0 0x5644e3c9b890 pgfault
0x1183 0x46 0x0 0x3 0x1 0x5644e3c9b8d0 pgfault
0xab29 0x2ac 0x0 0x29 0x2 0x5644e3c9b910
pgfault
0xab21 0x2ac 0x0 0x21 0x2 0x5644e3c9b910
0x1902 0x64 0x0 0x2 0x3 0x5644e3c9b950 pgfault

LRU OUTPUT (16 frames)(11pf)

0x0000 0x0 0x0 0x0 0x0 0x562536bf1890

0x0001 0x0 0x0 0x1 0x0 0x562536bf1890

0x0002 0x0 0x0 0x2 0x0 0x562536bf1890

0x2003 0x80 0x0 0x3 0x1 0x562536bf18d0

0x2104 0x84 0x0 0x4 0x2 0x562536bf1910

0x1205 0x48 0x0 0x5 0x3 0x562536bf1950

0x0000 0x0 0x0 0x0 0x0 0x562536bf1890

0x3d27 0xf4 0x0 0x27 0x4 0x562536bf1990

0x3328 0xcc 0x0 0x28 0x5 0x562536bf19d0

0x2429 0x90 0x0 0x29 0x6 0x562536bf1a10

0xaa29 0x2a8 0x0 0x29 0x7 0x562536bf1a50

0xab29 0x2ac 0x0 0x29 0x8 0x562536bf1a90

0xab29 0x2ac 0x0 0x29 0x8 0x562536bf1a90

0xab21 0x2ac 0x0 0x21 0x8 0x562536bf1a90

0x1205 0x48 0x0 0x5 0x3 0x562536bf1950

0x1234 0x48 0x0 0x34 0x3 0x562536bf1950

0x0021 0x0 0x0 0x21 0x0 0x562536bf1890

0x4202 0x108 0x0 0x2 0x9 0x562536bf1ad0

0x2034 0x80 0x0 0x34 0x1 0x562536bf18d0

0x2104 0x84 0x0 0x4 0x2 0x562536bf1910

0x1205 0x48 0x0 0x5 0x3 0x562536bf1950

0x0320 0xc 0x0 0x20 0xa 0x562536bf1b10

0x3d21 0xf4 0x0 0x21 0x4 0x562536bf1990
0x1228 0x48 0x0 0x28 0x3 0x562536bf1950
0x1429 0x50 0x0 0x29 0xb 0x562536bf1b50
0x1129 0x44 0x0 0x29 0xc 0x562536bf1b90
0x1119 0x44 0x0 0x19 0xc 0x562536bf1b90
0x2b29 0xac 0x0 0x29 0xd 0x562536bf1bd0
0x2121 0x84 0x0 0x21 0x2 0x562536bf1910
0x2205 0x88 0x0 0x5 0xe 0x562536bf1c10
0x0000 0x0 0x0 0x0 0x0 0x562536bf1890
0xbf01 0x2fc 0x0 0x1 0xf 0x562536bf1c50
0x4302 0x10c 0x0 0x2 0x7 0x562536bf1a50 pgfault
0x2703 0x9c 0x0 0x3 0xb 0x562536bf1b50 pgfault
0xaaaa 0x2aa 0x0 0x2a 0x6 0x562536bf1a10
pgfault
0xbbbb 0x2ee 0x0 0x3b 0x1 0x562536bf18d0
pgfault
0xabcd 0x2af 0x0 0xd 0xf 0x562536bf1c50 pgfault
0xeffe 0x3bf 0x0 0x3e 0x3 0x562536bf1950 pgfault
0xefab 0x3be 0x0 0x2b 0xe 0x562536bf1c10 pgfault
0xfefe 0x3fb 0x0 0x3e 0xa 0x562536bf1b10 pgfault
0x8c0a 0x230 0x0 0xa 0x4 0x562536bf1990 pgfault
0x1183 0x46 0x0 0x3 0x5 0x562536bf19d0 pgfault
0xab29 0x2ac 0x0 0x29 0x8 0x562536bf1a90
0xab21 0x2ac 0x0 0x21 0x8 0x562536bf1a90

0x1902 0x64 0x0 0x2 0xc 0x562536bf1b90 pgfault

**LOW AMOUNT OF SAME ADDRESSES ->
RESULT EXPLANATATION
(previous examples)**

	FIFO	CLOCK	LRU
FRAME	**4**	**4**	**16**
PAGE FAULT	32	32	11

When address repetition is low, the impact of the page replacement algorithm diminishes because the system encounters a diverse set of memory accesses with minimal repetition of the same pages. In such scenarios, the algorithm has fewer opportunities to influence performance since each memory access typically involves unique pages. The critical role of page replacement algorithms is more pronounced in situations with high address repetition, where the algorithm's decisions become pivotal in efficiently managing the limited physical memory by determining which pages to retain and

which to swap out to the disk. In low repetition scenarios, the system's performance is less sensitive to the specific choice of page replacement algorithm due to the infrequent need for decisions about replacing pages in memory.

INPUT 2: (HIGH AMOUNT OF SAME ADDRESSES)

r 0x0000
w 0x1001
w 0x2002 0x51
r 0x3003
r 0x4000
w 0x0001
w 0x3002 0x51
r 0x7003
r 0x0000
w 0x9001
w 0x1002 0x51
r 0x6003

FIFO OUTPUT:

0x0000 0x0 0x0 0x0 0x0 0x55dc49a77480

0x1001 0x40 0x0 0x1 0x1 0x55dc49a774c0

0x2002 0x80 0x0 0x2 0x2 0x55dc49a77500

0x3003 0xc0 0x0 0x3 0x3 0x55dc49a77540

0x4000 0x100 0x0 0x0 0x0 0x55dc49a77480 pgfault

0x0001 0x0 0x0 0x1 0x1 0x55dc49a774c0 pgfault

0x3002 0xc0 0x0 0x2 0x3 0x55dc49a77540

0x7003 0x1c0 0x0 0x3 0x2 0x55dc49a77500 pgfault

0x0000 0x0 0x0 0x0 0x1 0x55dc49a774c0

0x9001 0x240 0x0 0x1 0x3 0x55dc49a77540 pgfault

0x1002 0x40 0x0 0x2 0x0 0x55dc49a77480 pgfault

0x6003 0x180 0x0 0x3 0x1 0x55dc49a774c0 pgfault

HIGH AMOUNT OF SAME ADDRESSES -> RESULT EXPLANATATION
(previous example)

When address repetition is high, the choice of page replacement algorithm becomes more crucial in determining system performance. In scenarios with frequent access to the same pages, the limited number of available memory frames may lead to a higher likelihood of page faults. The page

replacement algorithm is responsible for deciding which page to evict from memory when a new page needs to be loaded. In high address repetition situations, an efficient page replacement algorithm can minimize the number of page faults by making intelligent decisions about which pages to retain in physical memory, optimizing the overall system performance. Popular page replacement algorithms, such as Least Recently Used (LRU) or Optimal Page Replacement, become more relevant in these scenarios as they aim to prioritize keeping frequently accessed pages in memory.