TA_practice(實習課練習-EAT&&PageReplacement)

加分要求:完成以下大題(並備註是哪個習題，並分檔繳交):

I. Consider a paging system with the page table stored in memory and TLBs in system. If a memory reference takes 10 milliseconds (ms) and 90 percent of all page table references are found in the TLBs, assume that finding a page-table entry in the TLBs takes 0.02 ms, what is the effective memory reference time?

II. Initially, assume there are “four”free frames in the system,and we have the following reference string:
1, 2, 3, 1, 5, 6, 0, 1, 2, 3, 1, 4, 1, 5, 2
How many page faults would occur for the following algorithms? Please detail the replacement process.
(a)FIFO replacement:
(b)LRU replacement:
(c)Optimal replacement:

要求:

A. 必要時請標註題號

B. 可參考實習課 PPT_week16

C. 可以放上截圖照片(但請保持文字與圖像的可辨識性為限)

D. 請繳交學號與習題檔名（檔名為: s+學號習題.檔案)

E. 一大題各一分助教分，依助教分計算，此作業區總分為 2 (實習課點名與練習總和分數為”助教分”，上限 10 分為限)

I. **Consider a paging system with the page table stored in memory and TLBs in system. If a memory reference takes 10 milliseconds (ms) and 90 percent of all page table references are found in the TLBs, assume that finding a page-table entry in the TLBs takes 0.02 ms, what is the effective memory reference time?**

α = Hit ratio, ε = TLB search time

Effective Access Time (EAT) $= (1+\varepsilon)\alpha + (2+\varepsilon)(1-\alpha)$

$= 2 + \varepsilon - \alpha$

2個 memory access time | hit ratio | TLB search time

見 CH8 (II), P.19

⇒ $\alpha = 0.9$, $\varepsilon = 0.02$ ms, ref time = 10 ms

EAT $= 10\text{ ms} \times 2 + 0.02\text{ ms} - 0.9 = 11.02$ ms #

2個 memory access time | TLB search time | hit ratio

II. Initially, assume there are "four"free frames in the system,and we have the following reference string:

1, 2, 3, 1, 5, 6, 0, 1, 2, 3, 1, 4, 1, 5, 2

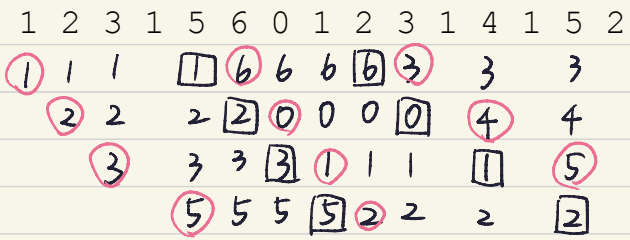
How many page faults would occur for the following algorithms? Please detail the replacement process.

(a)FIFO replacement:

(b)LRU replacement:

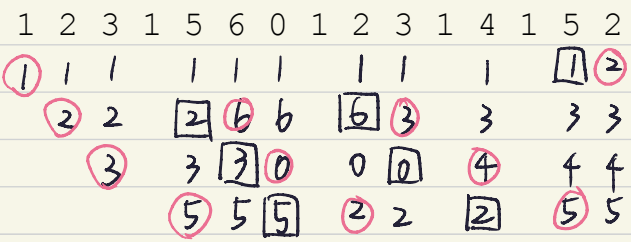
(c)Optimal replacement:

(a) FIFO



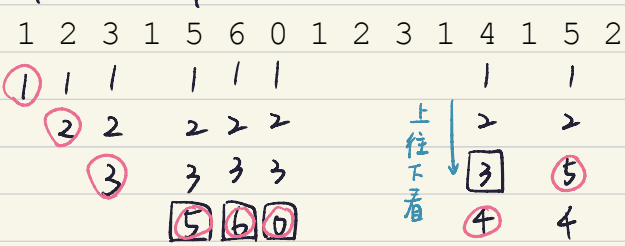
Page Fault : 11

(b) LRU (←)



Page Fault : 11

(c) optimal replacement (→)



Page Fault : 8