

## TA\_practice(實習課練習-Allocation Problem&&Address Translation)

**加分要求:完成以下大題(並備註是哪個習題，並分檔繳交):**

- I. Given four memory holes of 400KB, 250KB, 150KB, and 550KB (in order). Please draw a graph to describe how would the first-fit, best fit, and worst fit algorithms place processes of 130KB (P1), 350KB(P2), 210KB(P3), and 320KB(P4) (in order)? Note that, the process can be placed into the hole only if the size of a hole is greater than the size of a process. If a process cannot be placed into the hole, name it.

400KB	
250KB	
150KB	
550KB	

- (b) (3%) Which algorithm makes the most efficient use of memory?

- II. Consider a page table as shown in the following figure. Here, use a page size of 32bytes and a physical memory of 512bytes. Please map the following logical address to physical address.

(a) Logical address 102

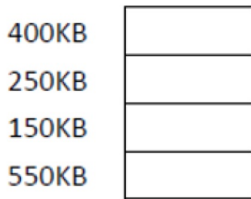
(b) Logical address 43

page table	0	9
	1	2
	2	1
	3	7
	4	5
	5	6
	6	8
	7	3

**要求:**

- A. 必要時請標註題號
- B. 可參考實習課 PPT\_week15
- 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. Given four memory holes of 400KB, 250KB, 150KB, and 550KB (in order). Please draw a graph to describe how would the first-fit, best fit, and worst fit algorithms place processes of 130KB (P1), 350KB(P2), 210KB(P3), and 320KB(P4) (in order)? Note that, the process can be placed into the hole only if the size of a hole is greater than the size of a process. If a process cannot be placed into the hole, name it.



(b) (3%) Which algorithm makes the most efficient use of memory?

(a) first fit	best fit	worst fit																								
<table><tr><td>400KB</td><td>P1 P3</td></tr><tr><td>250KB</td><td></td></tr><tr><td>150KB</td><td></td></tr><tr><td>550KB</td><td>P2</td></tr></table>	400KB	P1 P3	250KB		150KB		550KB	P2	<table><tr><td>400KB</td><td>P2</td></tr><tr><td>250KB</td><td>P3</td></tr><tr><td>150KB</td><td>P1</td></tr><tr><td>550KB</td><td>P4</td></tr></table>	400KB	P2	250KB	P3	150KB	P1	550KB	P4	<table><tr><td>400KB</td><td>P3</td></tr><tr><td>250KB</td><td></td></tr><tr><td>150KB</td><td></td></tr><tr><td>550KB</td><td>P1 P2</td></tr></table>	400KB	P3	250KB		150KB		550KB	P1 P2
400KB	P1 P3																									
250KB																										
150KB																										
550KB	P2																									
400KB	P2																									
250KB	P3																									
150KB	P1																									
550KB	P4																									
400KB	P3																									
250KB																										
150KB																										
550KB	P1 P2																									
P4 放不下		P4 放不下																								

(b) first fit =  $(130+350+210)/1350 = 51.1\%$   
 best fit =  $(130+350+210+320)/1350 = 74.8\%$   
 worst fit =  $(130+350+210)/1350 = 51.1\%$

best fit 使用率最高

II. Consider a page table as shown in the following figure. Here, use a page size of 32bytes and a physical memory of 512bytes. Please map the following logical address to physical address.

(a) Logical address 102 $\leftarrow$

(b) Logical address 43 $\leftarrow$

page table

0	9
1	2
2	1
3	7
4	5
5	6
6	8
7	3

page size = 32-byte =  $2^5$  byte  $\rightarrow$  page offset = 5-bit  
 mem size = 512-byte =  $2^9$  byte  $\rightarrow$  page number =  $9-5 = 4$ -bit

(a)  $102_{(10)} = 0110\ 0110_{(2)}$

0	9			
1	2			
2	1			
$\rightarrow$ ③	⑦	logical address	<u>0011</u> <u>00110</u> number offset	$\rightarrow$ page number = 3 $\rightarrow$ physical frame = 1
4	5			
5	6			
6	8	physical address	<u>0111</u> <u>00110</u> frame offset	$\rightarrow$ physical address = 230 #
7	3			

(b)  $43_{(10)} = 0010\ 1011_{(2)}$

0	9			
$\rightarrow$ ①	②	logical address	<u>0001</u> <u>01011</u> number offset	$\rightarrow$ page number = 1 $\rightarrow$ physical frame = 2
2	1			
3	7			
4	5			
5	6			
6	8	physical address	<u>0010</u> <u>00110</u> frame offset	$\rightarrow$ physical address = 15 #
7	3			