

1,

The answers are the same for (a) and (b). Assume that although processor operations cannot overlap, I/O operations can.

1 Job:	$TAT = NT$	processor utilisation	= 50%
2 Jobs:	$TAT = NT + T/2$	processor utilisation	= 100%
4 Jobs:	$TAT = 2NT + T/2$	processor utilisation	= 100%

2,

Main memory can hold 5 pages. The size of the array is 10 pages. If the array is sorted by rows, then each of 10 pages will need to be brought into main memory once. If it is stored by columns, then each row is scattered across all ten pages, and each page will have to be brought in 100 times (once for each row calculation)

3,

(i)  $1052 = 1 * 1024 + 28$  maps to VPN 1 in PFN 7,  $7 * 1024 + 28 = 7196$   
(ii)  $2221 = 2 * 1024 + 173$  maps to VPN 2, page fault  
(iii)  $5499 = 5 * 1024 + 379$  maps to VPN 5 in PFN 0,  $0 * 1024 + 379 = 379$

4,

A total of fifteen pages are referenced, the hit ratios are

N	Ratio
1	0/14
2	0/14
3	1/14
4	2/14
5	6/14
6	7/14
7	7/14
8	7/14