

CS 3113 FA 21 – Project (Homework)

Due 2021/12/07 (Please submit as a PDF document) You may write on the document or use LaTeX.

Questions will be graded on correctness and completeness. 7 questions follow.

Banker's Algorithm

1. The system has a total of **10** instances of a resource. Using Banker's Algorithm, will Processes A - D all run to completion? Please show your work and explain your reasoning for your answer.

PROCESS	CURRENT RESOURCES ALLOCATED	MAX RESOURCES NEEDED
PROCESS A	1	6
PROCESS B	1	5
PROCESS C	2	4
PROCESS D	4	7

2. The system has a total of **6** instances of Resource X and **5** instances of Resource Y. Using Banker's Algorithm, will Processes A - C all run to completion? Please show your work and explain your reasoning for your answer.

PROCESS	CURRENT X ALLOCATED	MAX X NEEDED	CURRENT Y ALLOCATED	MAX Y NEEDED
PROCESS A	4	6	1	3
PROCESS B	0	1	3	5
PROCESS C	1	1	0	1

3. The system has a total of **14** instances of Resource X and **11** instances of Resource Y. Using Banker's Algorithm, will Processes A - D all run to completion? Please show your work and explain your reasoning for your answer.

PROCESS	CURRENT X ALLOCATED	MAX X NEEDED	CURRENT Y ALLOCATED	MAX Y NEEDED
PROCESS A	0	0	1	1
PROCESS B	0	7	0	5
PROCESS C	3	3	5	5
PROCESS D	6	6	3	5

Paging

4. Assume a simple paging system with pages of size 2^5 . The process page tables are as follows (all numbers in hexadecimal):

P0:
0x3
0x4
0x7

P1:
0x1
0x2

P2:
0x8
0x5
0xA

Process 2 accesses address 0x5A. What is the physical address that is accessed?

5. Assume a simple segmentation system, with a maximum segment size of 2^6 , and the segmentation table for process P0 as follows (organized by length, base):

P0:
0x10, 0x30
0x20, 0x58
0x08, 0x20

When the process addresses location 0x5C, what physical address is accessed?

6. Assume a simple segmentation system, with a maximum segment size of 2^6 , and the segmentation table for process P0 as follows (organized by length, base):

P0:
0x10, 0x30
0x20, 0x58
0x08, 0x20

When the process addresses location 0x90, what physical address is accessed?

7. Assume a simple paging system with pages of size 2^5 . The process page tables are as follows (all numbers in hexadecimal):

P0:
0x3
0x4
0x7

P1:
0x1
0x2

P2:
0x8
0x5
0xA

Process 0 accesses address 0x13. What is the physical address that is accessed?