BRAC University, Dhaka
Department of Computer Science and Engineering

CSE321: Operating Systems, Spring 2024, Homework

Please write your name and registration number in your answer script.

Marks: 5 (2 + 2 +1) **Deadline: 20 April, 2024**

1. Assume, there are three processes: P0, P1, P2, P3 and P4. Also, there are three resources with the following instances: R0 (7), R1 (5), R2 (8). Now, consider following Allocation and Maximum Matrix:

P0	0	1	0
P1	2	0	0
P2	2	0	2
P3	1	1	1
P4	0	0	2

Allocation Matrix

P0	5	3	1
P1	3	2	2
P2	2	0	2
P3	2	1	2
P4	2	3	1

Maximum Matrix

   i. Determine the need and the available matrices.
   ii. Determine the safe sequence (if any).

2. Suppose in a system there are two processes: P1(16 bytes) and P2(12 bytes) with a page size of 4 bytes. The main memory size is 32 bytes. Page tables of both processes are given below:

p	f
0	1
1	0
2	2
3	7

P1's Page Table

p	f
0	5
1	3
2	4

P2's Page Table

   Find the corresponding physical addresses of the following logical addresses.
   i. 1001 of P1
   ii. 1010 of P1
   iii. 0011 of P2
   iv. 0100 of P2

3. Assume you have a page size of 1024 KB and a process size is 9600 KB. How many pages would be required for this process? What would be the internal fragmentation size? If the page size is reduced to 512KB, what benefits it might bring?