CS 405 Homework (part of Exam 3): Submit before class time 8 am - Tuesday 11/24.

Part A: (20)

Given the current state of the system:

Resource available with the system: 40

|  |  |  |  |
| --- | --- | --- | --- |
| Process Name | Maximum Need | Allocated | Remaining Need |
| P1 | 100 | 60 | 40 |
| P2 | 120 | 50 | 70 |
| P3 | 80 | 50 | 30 |
| P4 | 50 | 20 | 30 |

Evaluate each of the following request independently (on the above state). State if the request is safe and should be allocated. If so – show a sequence of allocation to complete all processe.

Process P3 makes a request for 30.

P1 requests 40.

P4 requests 20.

Part B: (20)

Consider the following reference string for a process: 1 2 3 4 3 4 3 4 3 4 5 6 5 6 5 6 4 5 6 1

What is the number of page faults with pure demand paging – with pre-allocation of frames.

What is the number of page faults when 1 page frame is allocated for the process?

What is the number of page faults when 3 page frames are allocated, and the page replacement if FIFO? Show the references that cause a fault.

What is the number of page faults when 3 page frames are allocated, and the page replacement if LIFO? Show the references that cause a fault.

Part C: (20)

Memory access time is 100 nanoseconds. Page fault detection and replacement algorithm and page fetch requires 1 millisecond.

What is the effective access time (EAT) when the page fault rate is 0 %?

What is the EAT when the page fault rate is 1 %?