CSS-430 : Operating Systems : HW08-Questions

**Assignment Text**

Complete the following problems from the OSC book, 10th edition:

* Problem 10.3
* Problem 10.8
* Problem 10.29

10.3

Question: Consider the following page-replacement algorithms. Rank these algorithms on a five-point scale from “bad” to “perfect” according to their page-fault rate. Separate those algorithms that suffer from Belady’s anomaly from those that do not..

a. LRU replacement

b. FIFO replacement

c. Optimal replacement

d. Second-chance replacemen

10.8

Question: Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, and seven frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each.

• LRU replacement

• FIFO replacement

• Optimal replacement

10.29

Question: Consider a demand-paging system with the following time-measured utilizations:

|  |  |
| --- | --- |
| CPU utilization | 20% |
| Paging disk | 97.7% |
| Other IO devices | 5% |

For each of the following, indicate whether it will (or is likely to) improve CPU utilization. Explain your answers.

a. Install a faster CPU.   
b. Install a bigger paging disk.  
c. Increase the degree of multiprogramming.   
d. Decrease the degree of multiprogramming.   
e. Install more main memory.

f. Install a faster hard disk or multiple controllers with multiple hard disks.

g. Add prepaging to the page-fetch algorithms.   
h. Increase the page size