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Topic Title

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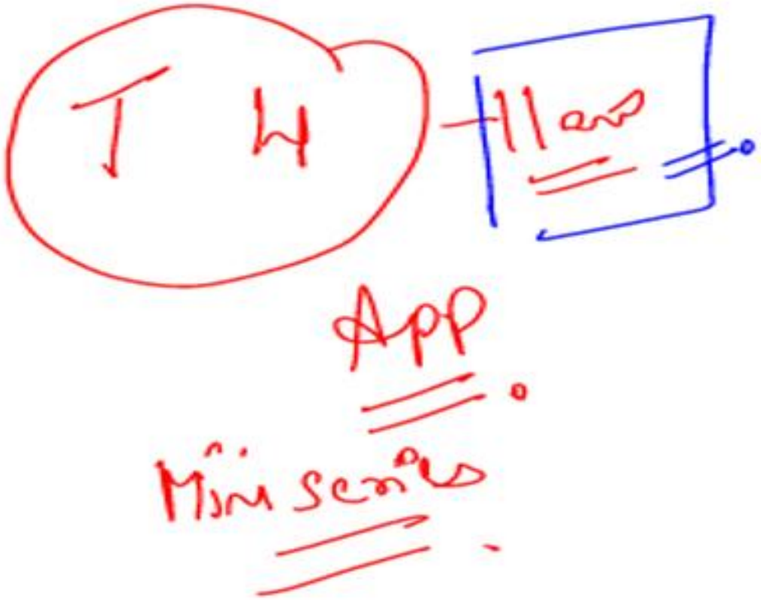
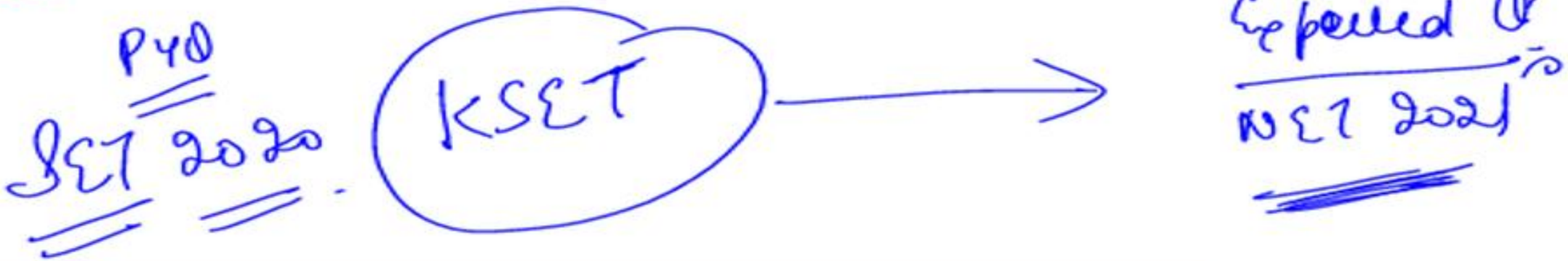
Very imp

Content:-

1. Page Replacement Algorithm
   a. First-in-first-out(FIFO)
   b. Optimal Replacement
   c. Least Recently Used(LRU)
2. Locality of Reference
3. Thrashing





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Page Fault (Bring the page from SM & make its entry in the PMT)

n.

(1) Free space available in the memory -

OR

Bring the page, make its entry in PMT.

(2) No free space in memory -

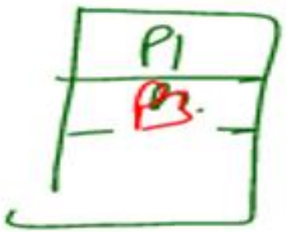
Page Replacement

↓

Remove a page from MM, delete its entry from PMT, Bring another page & make its entry in PMT.

Algorithms of page replacement:-

1. First-in-first-out(FIFO)
2. Optimal Replacement
3. Least Recently Used(LRU)



1. **First-in-first-out(FIFO):** In this method , the oldest page present in the memory is selected for replacement.
2. **Optimal Replacement:-** This algorithm has lowest page fault rate for all algorithm of page replacement. This algorithm states that page which will not to be used for longest period of time i.e. **future knowledge of reference string is required.**
3. **Least Recently Used(LRU)**:- In this algorithm, the page that has been not used for longest period of time is selected for replacement.

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(3) Optimal – (Ideal) – see the future.

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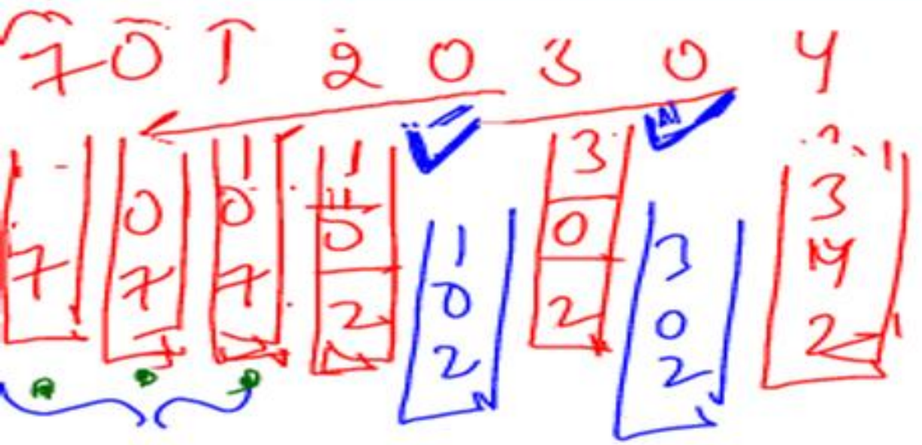
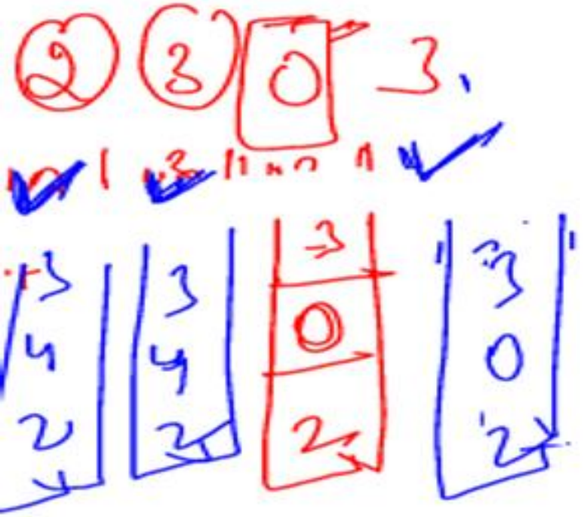
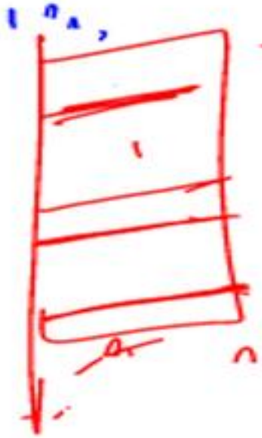


Q. If the content of reference using is 7,0,1,2,0,3,0,4,2,3,0,3 and there are three frames available in the memory.

① Page faults :-
(1) 5 (2) 7 (3) 9
(4) 11





Locality of Reference of a Process:-

At any time, during its execution, a process will be accessing only a small subset of logical address space. This subset of logical address space is called its current locality of its reference. The current locality keep on shifting.

7-3
= (4)

① No. of page faults excluding filling of memory frames
(1) 7 (2) 5 (3) 4 (4) None

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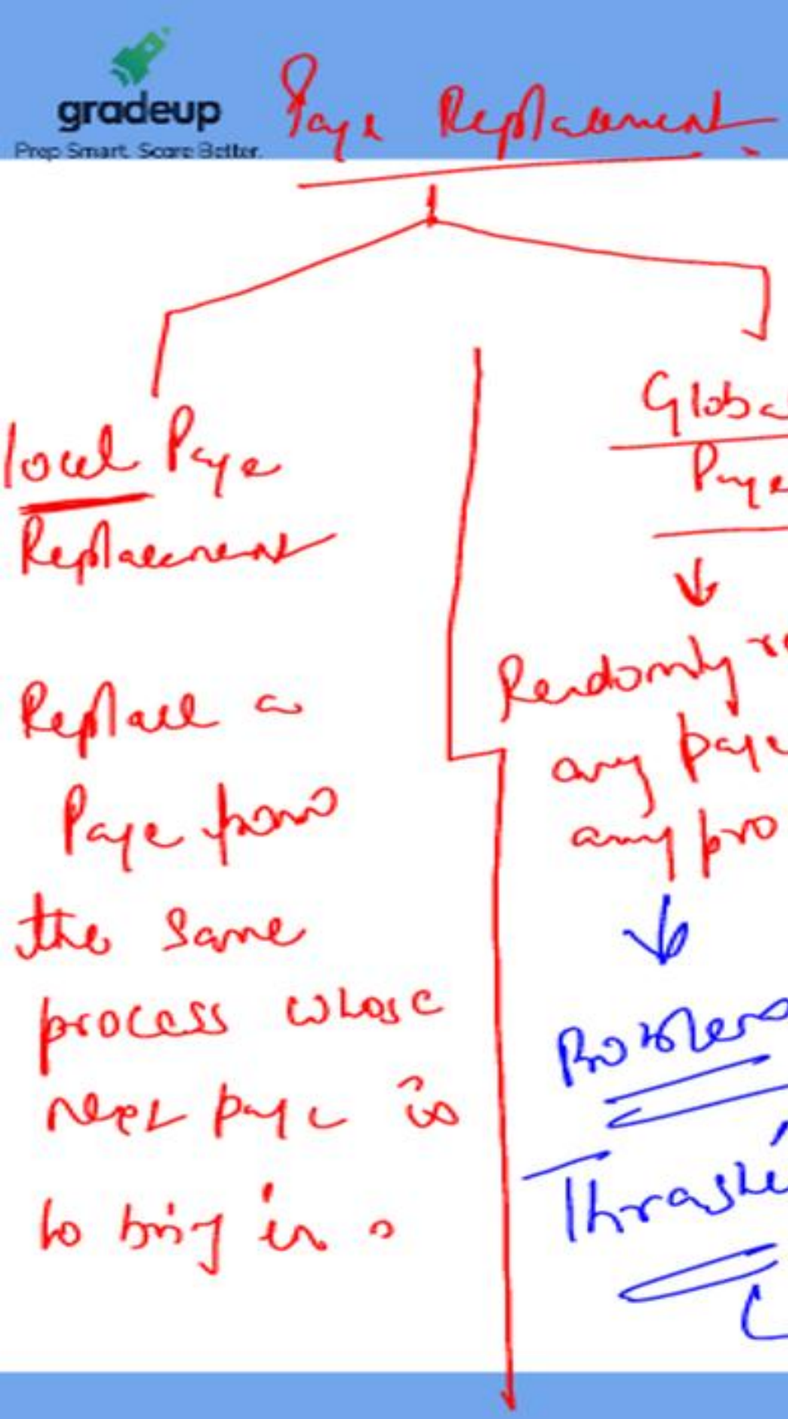

Thrashing:-

The phenomenon of moving pages from primary to secondary storage or vice-versa consumes a lot of computer's energy but accomplished very little useful results. This situation is called thrashing. A process is in thrashing, if it is spending more time is paging instead of their execution.

The CPU utilization is plotted against degree of multiprogramming. As degree of multiprogramming increases, CPU utilization goes on increasing although more slowly, until a maximum is reached. After this point degree of multiprogramming is increased then thrashing is occurred and CPU utilization drops sharply after this point.

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Purpose of Demand Paging :- To ↑ degree of multiprogramming

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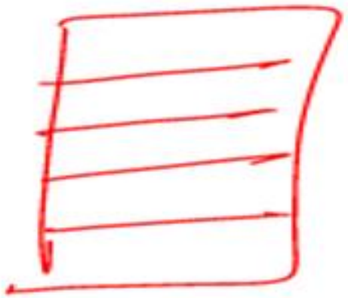
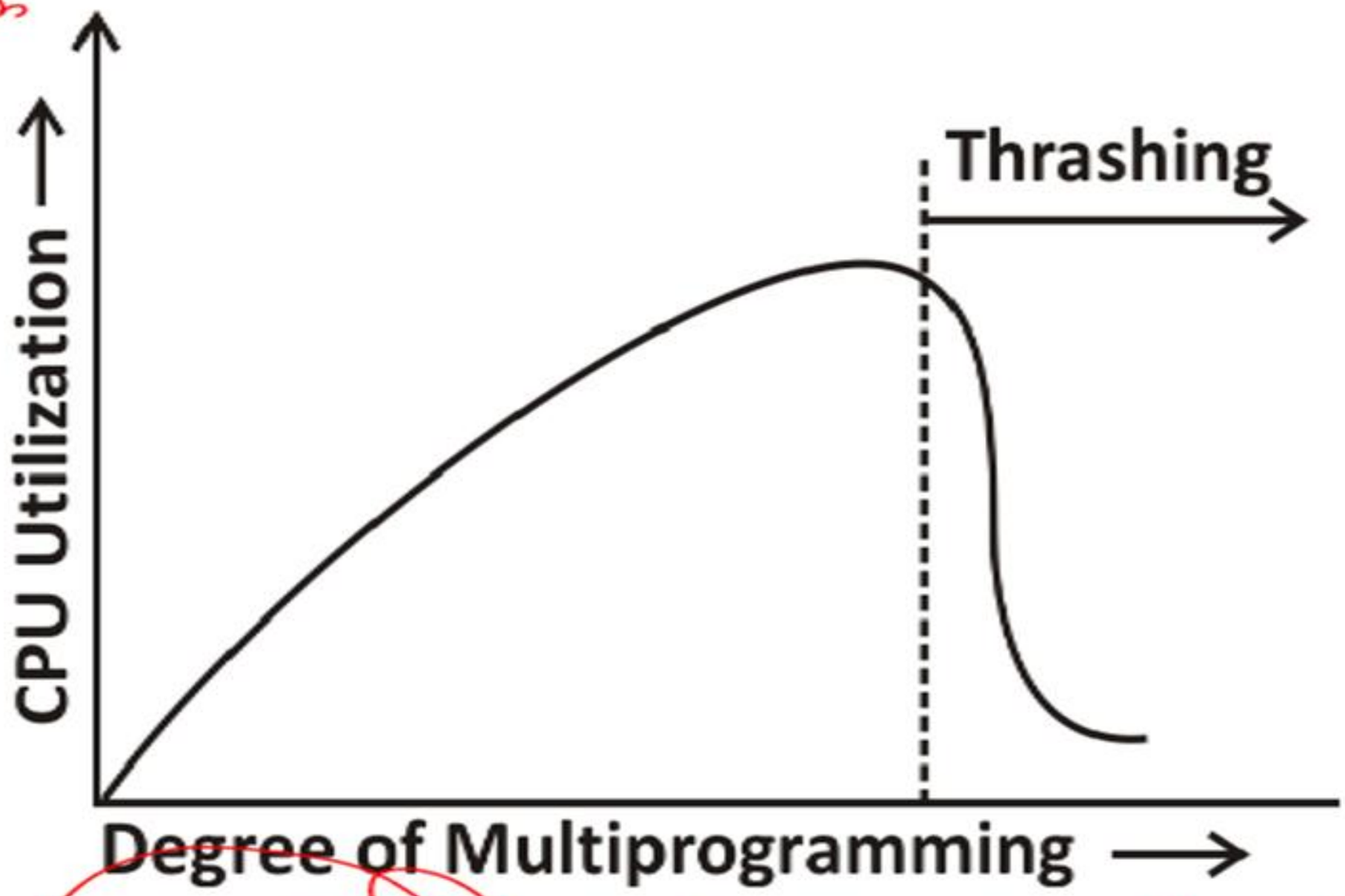
A B C D E

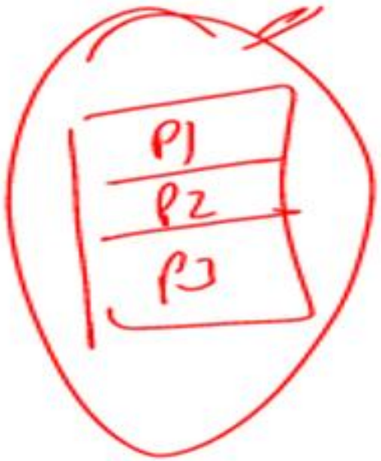
Processes



Memory



Problem → Thrashing → sol → limit the degree of multiprogramming.



P4

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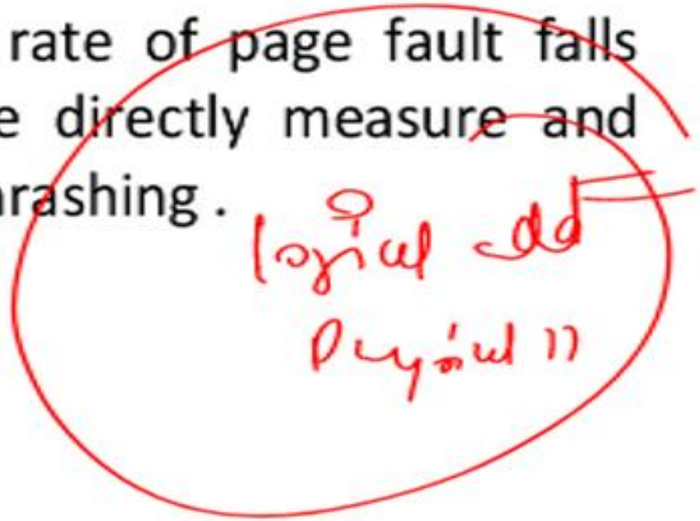
Measures to avoid thrashing :-

To prevent from thrashing a strategy called as page-fault frequency (PFF) is used . since , thrashing has a high rate of page fault rate is too low , then the process has too many frames. We can establish upper and lowest bounds on the desired page fault rate. If the actual page fault rate exceeds the upper limit , we allocate that process to another frame. We remove a frame from that process if there is possibility arise for the rate of page fault falls below the lower limit . Thus we directly measure and control the page rate to prevent thrashing .

Some similar topics



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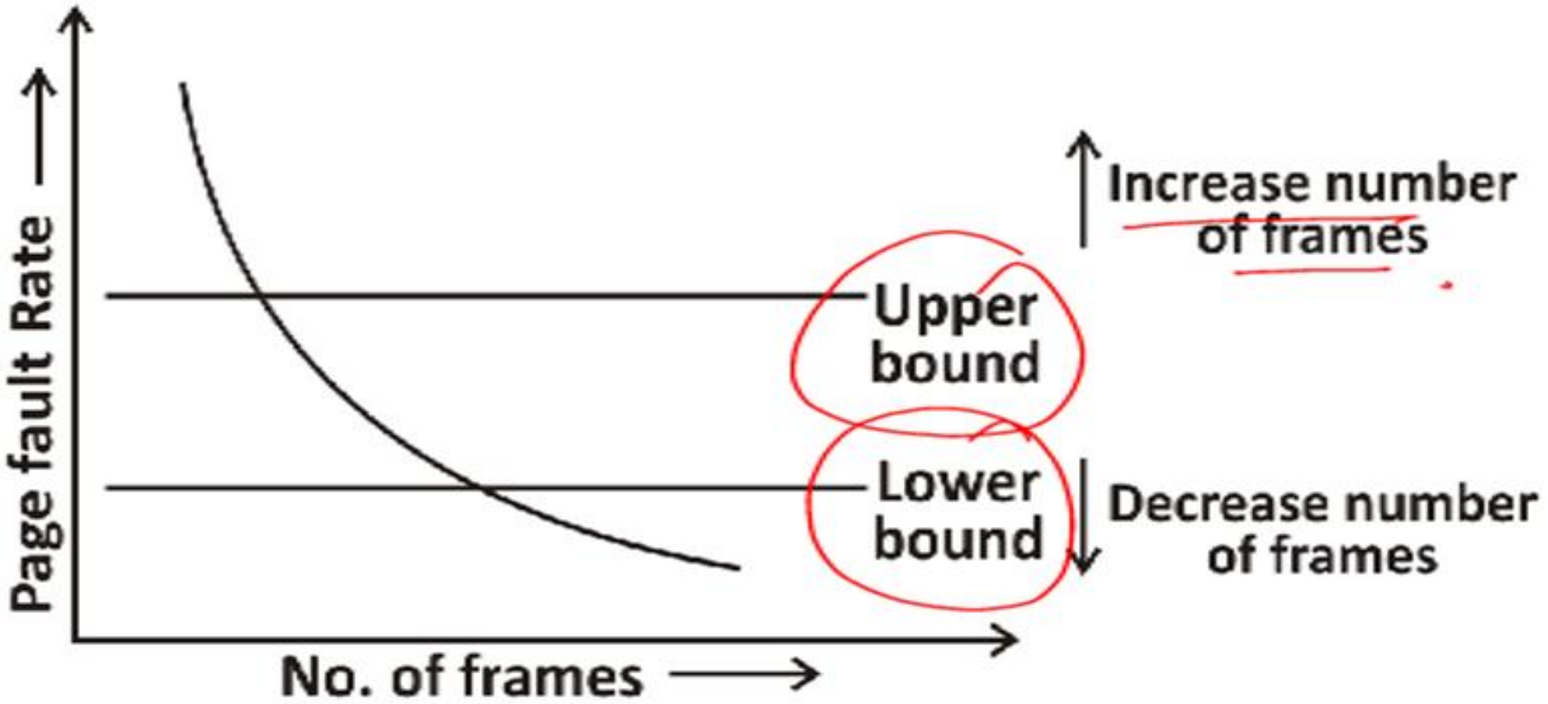
Page fault's overhead



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UGC NET All India Mega Mock Challenge Paper 2

LIVE MOCK TEST	LIVE DATE
UGC NET Geography	Sat, 12-June
UGC NET Commerce	Sat, 19-June
UGC NET Labour Welfare	Sat, 26-June

Problem — FIFO Page Replacement Algorithm :-

Belady Anomaly =

EVERY SUNDAY

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11:30 AM

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Ideally :- If we ↑ no of memory frames then Page faults ↓.

Paper 01

- Real-time exam experience every sunday
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Sun, 06-June | Sun, 13-June | Sun, 20-June

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But in FIFO :- If we ↑ no of Page frames then after a bit Page faults start ↑.

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