Paging Practice Question

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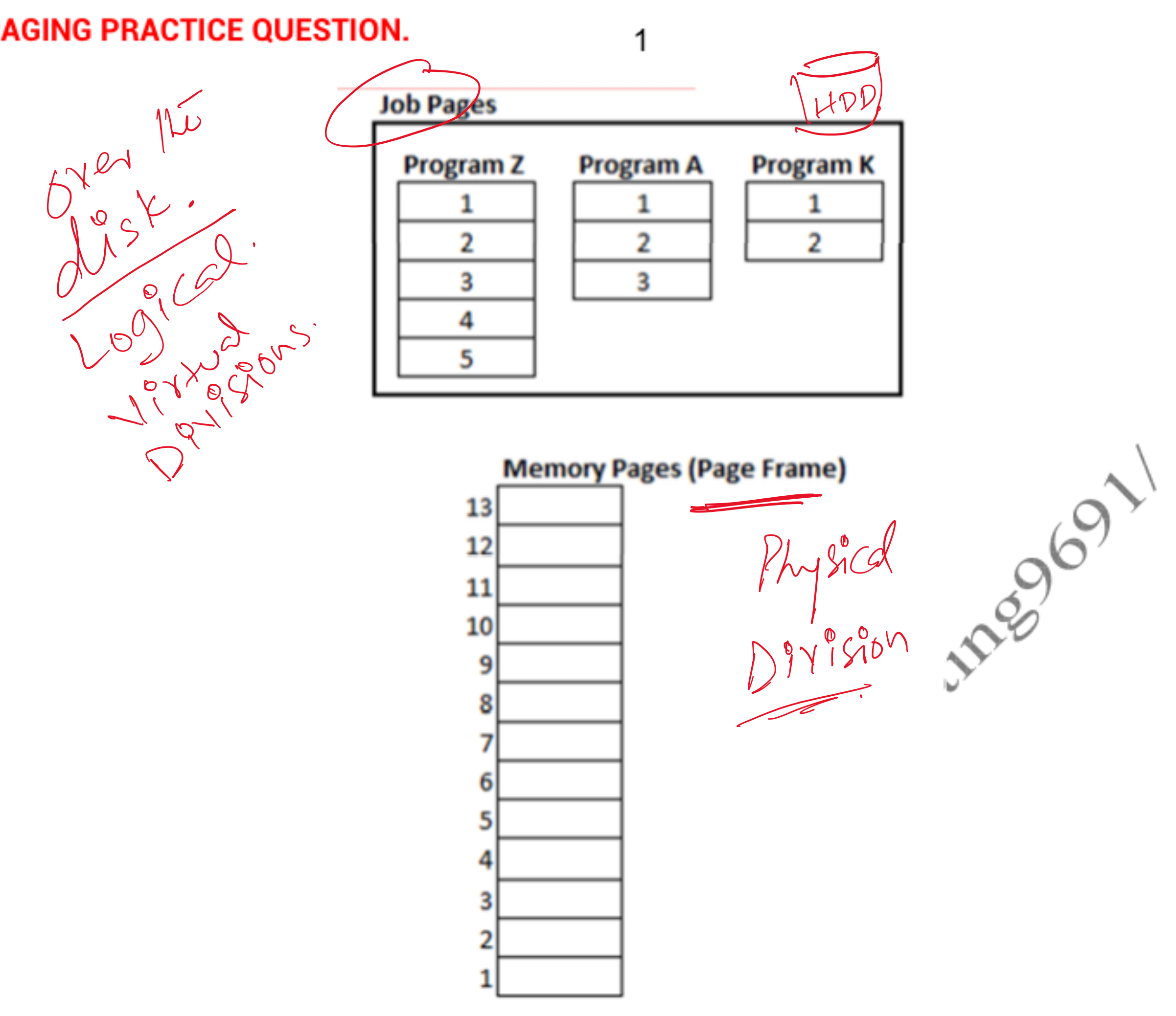
Paging Practice...

PAGING PRACTICE QUESTION.



1 a) What are job pages?

Every program or task saved over the storage is divided into fixed sized chunks/parts called pages. When required only pages that are required are loaded in page frames and not the whole program. [2]

b) What are Memory pages?

Page frame created inside the main memory to accomodate job pages are memory pages. [2]

c) i) What type of memory management technique is being used here by the operating system?

Operating System uses "PAGING" memory technique. [1]

ii) Explain what is meant by paging?

A memory management technique mostly used by O/S like windows operating system. Paging divides installed programs into fixed size pages (Logical) and load and uses them individually in main memory (RAM). [3]

iii) Give **two** benefits of using paging.

Benefit Programs amounting more than the available memory are loaded.
Reason Only pages required are loaded and not the whole program.

Benefit RAM never fails loading more programs.
Reason Use of virtual memory. [4]

Page Frame Table

Job Page	Memory Page Frame	
	1	Not available
Z1	2	*
		Not available
Z2	4	
Z5	5	
		Not available
A1	7	*
		Not available
A3	9	
		Not available
K1	11	
Z3	12	
K2	13	*

idle pages

c) Few of the memory pages (frames) are not available for the programs.
What could be the possible reasons for this?

- O/S related pages
- Pages currently being executed/used.

[4]

d) Why operating system uses Page table?

To keep a track of job pages and their respective memory page frame unit in main memory for the smooth execution of the current programs. [2]

e) Load the following Job Pages in ascending and available memory order of Page Frame Table **above**.

`Z1, Z2, Z5, A1, A3, K1, Z3, K2`

[6]

2 Few memory pages (frames) are marked (*) to show that they are idle for the most time.

a) What is Virtual Memory?

- Area over the permanent/secondary storage that is dedicated & used as paged memory.
- Those Program pages, which are idle for the most time are offloaded to this paged memory to find more space in actual memory (RAM/IAS).
- This secondary Storage based memory is called virtual memory.

[4]

b) How these marked pages are connected to Virtual Memory?

As O/S keeps track of all the pages, using an operating system executive, to mark those pages which are idle in ready queue and wasting time in running state, so when new space is required these marked ones could be sent to virtual memory. [2]

c) What is the reason that only those marked memory pages that are holding unsaved data are sent to virtual memory while others are simply offloaded?

- Program pages are not sent to VM as they are already stored over the secondary storage, they are simply offloaded.
- Data pages, if not already saved, then are sent to V.M when idle, otherwise offloaded too. [2]

Main Memory:
↳ Current Programs
↳ Their Data
↳ part of the O/S. (kernel)
(It never goes to V.M)

d) Program Z is a word processor. While using Z user has pressed spell check tool bar button to check the spellings in entered text.
- Page 4 of program Z holds instructions of spell checker routine. Z4

Program A is a spreadsheet. While using A user has opened a file.
- this action requires loading a data file, which requires two memory pages (frames). A4 A5

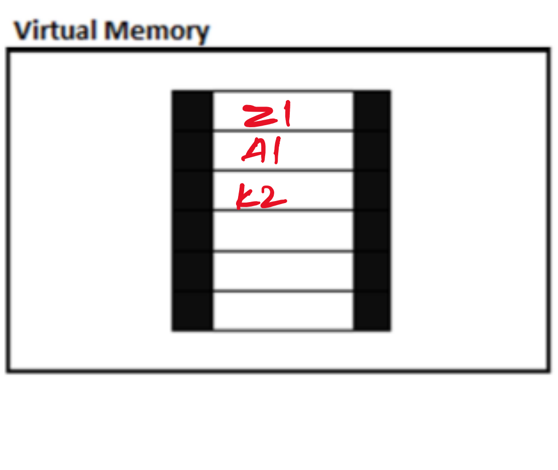
There is no space in memory to hold page Z4 and two pages of Program A's data file.
Few of the loaded pages are offloaded to the Virtual Memory to accommodate new pages in memory.

Update Virtual Memory and Memory Page frame table diagrams below to show the latest situation.

Page Frame Table

Job Page	Memory Page Frame	
		Not available
Z4	2	
		Not available
Z2	4	
Z5	5	
		Not available
A4	7	
		Not available
A3	9	
		Not available
K1	11	
Z3	12	
A5	13	

Virtual Memory



[10]