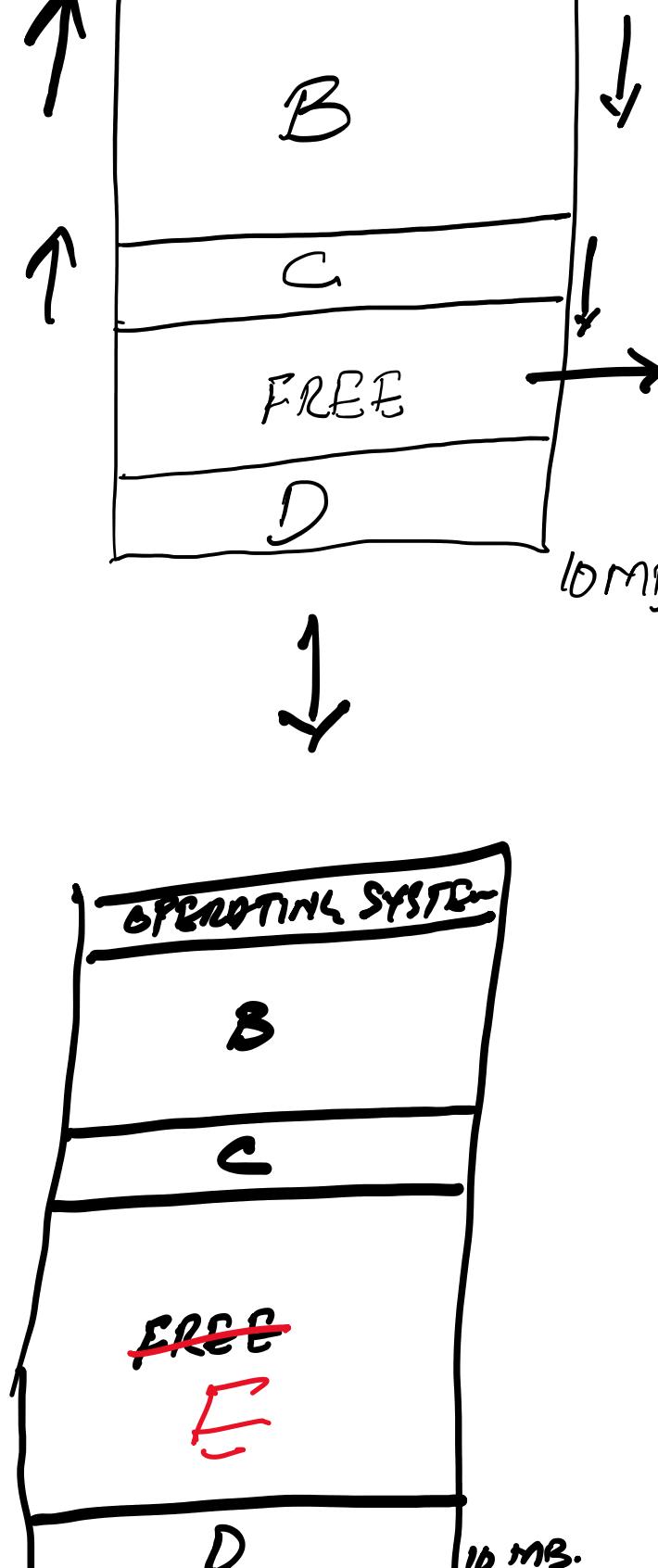
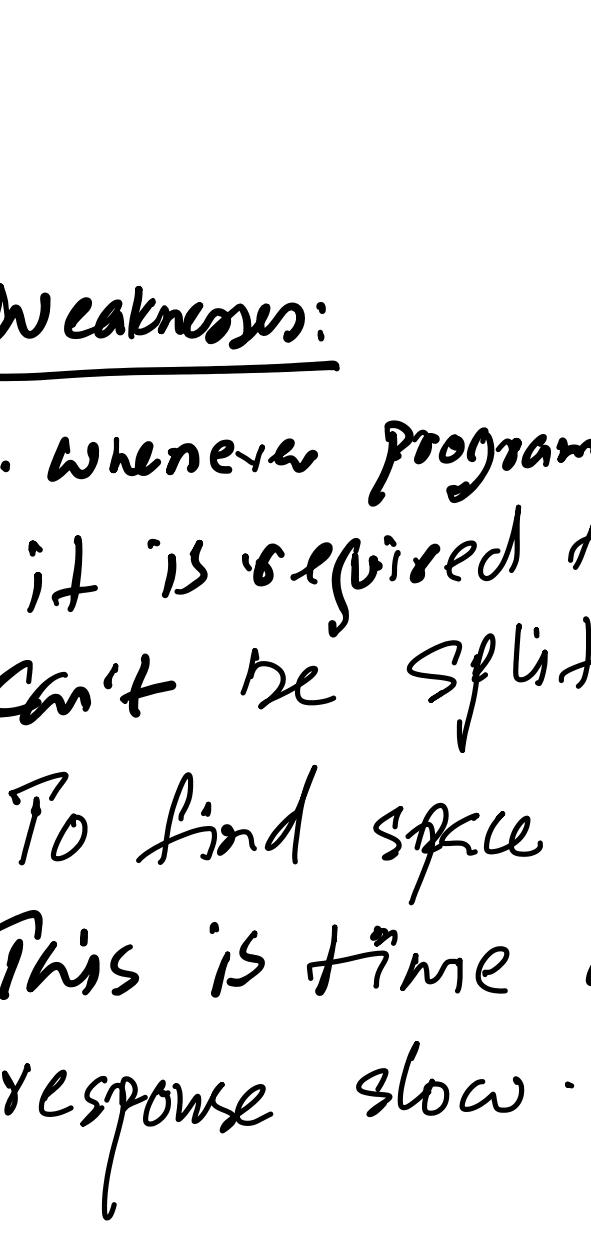


- Processor time
- Space (memory).

Variable Partitioning & Compaction:Main Memory

- Job "E" wants to load
- " " requires as much space as two memory holes.
- Job "E" can't be broken/split.



- So job B & C will be moved either up or down to find space for job "E".

- Shifting of job B & C is called Compaction, which is a time consuming job.

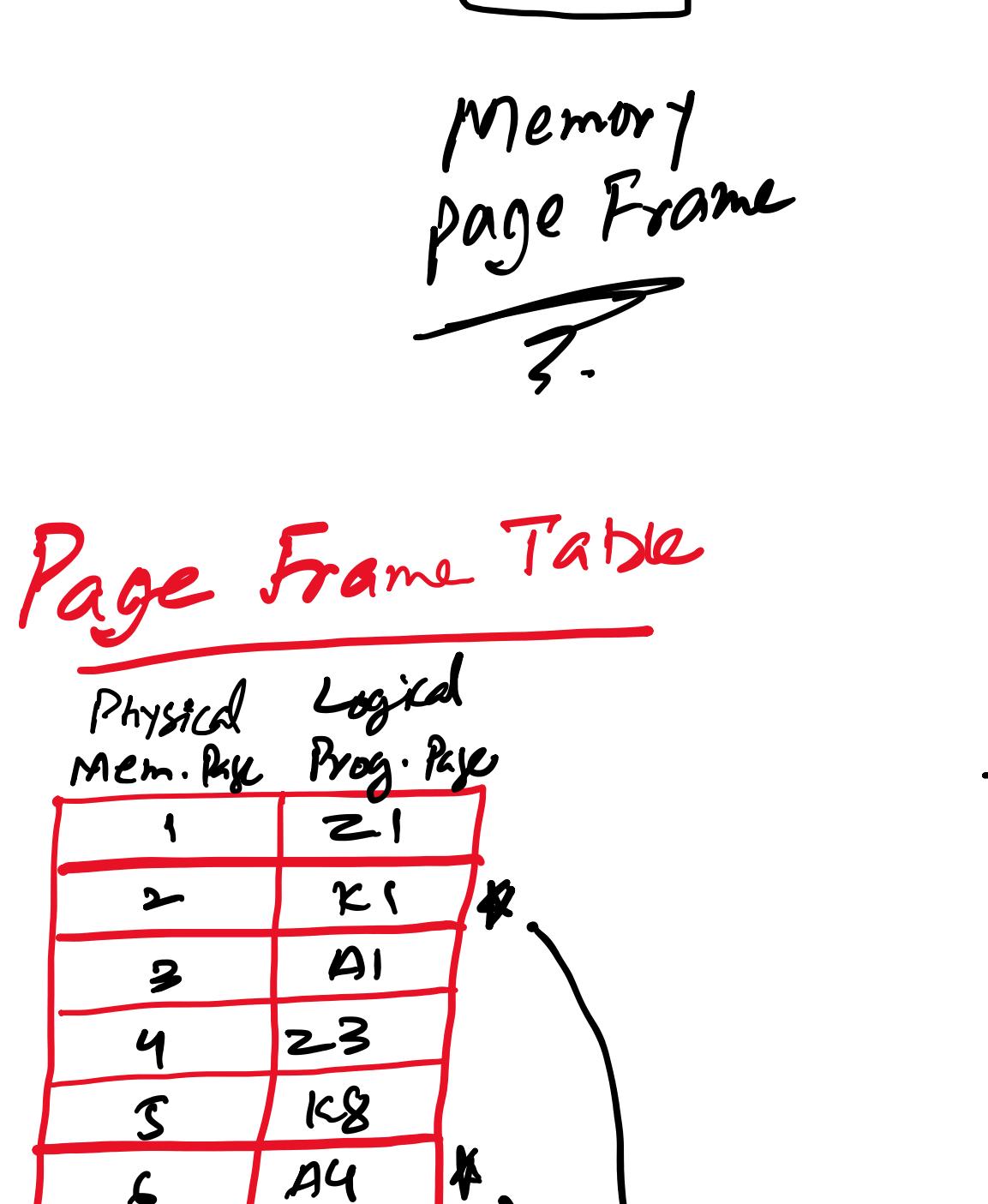
- Compaction requires both processor time & memory space.

- This makes computer either super slow or non-responsive.

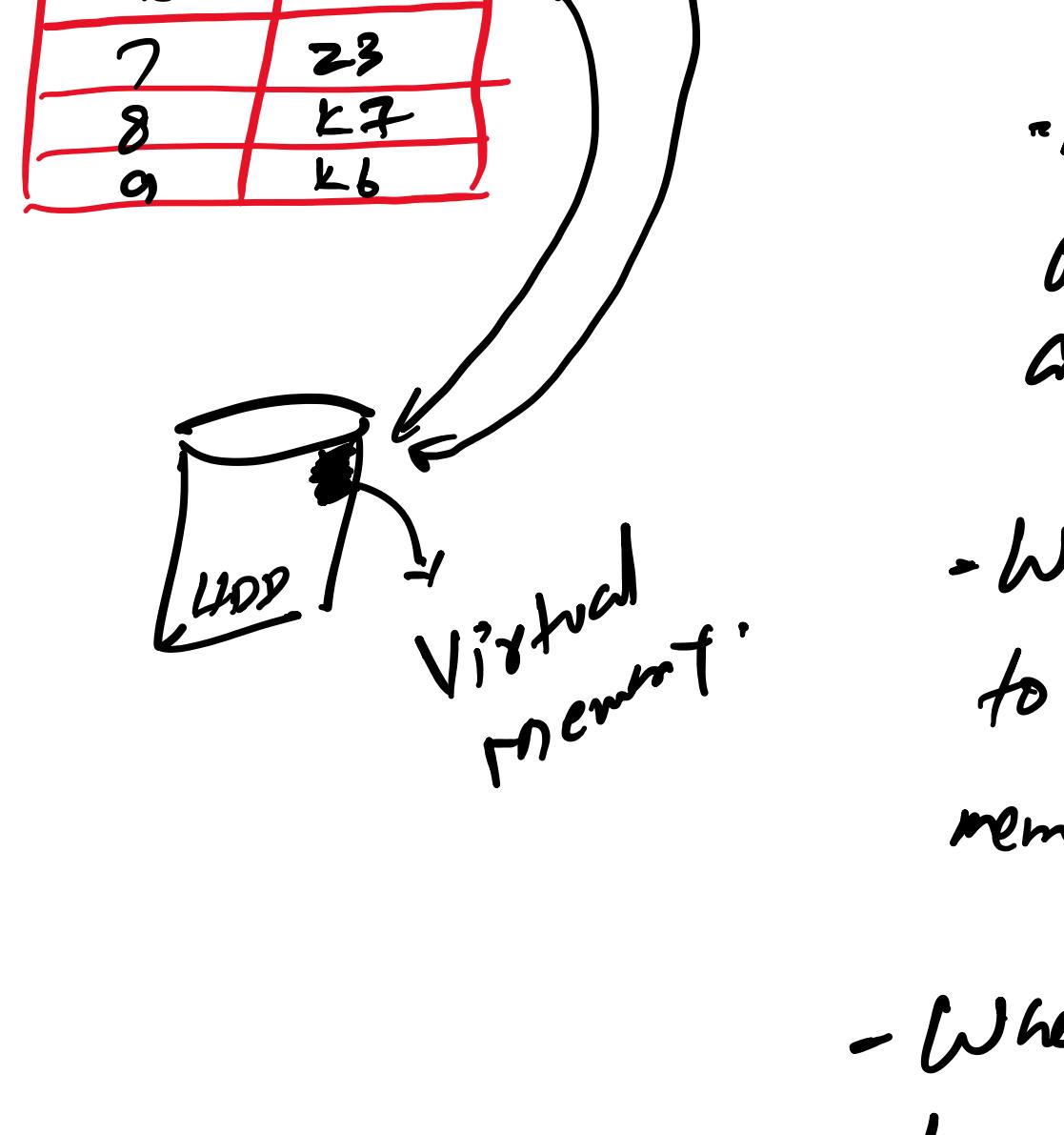
Weaknesses:

1. Whenever program is loaded, it is loaded as full whether it is required to be executed fully or partially. Programs can't be splitted into parts.

2. To find space for new programs compaction is done. This is time consuming job. Makes whole system response slow.

PAGING:

- Jobs installed over storage are divided into logical pages.
- Computer's main memory is divided into physical pages.



- Only logical pages of the installed jobs that are required are loaded.
- There is no need for compaction.
- Not the whole program is required to be loaded.
- fast, more programs can be loaded, and programs can be split.

Page Frame Table

| Physical Mem. Page | Logical Prog. Page |
|--------------------|--------------------|
| 1 | Z1 |
| 2 | K1 |
| 3 | A1 |
| 4 | Z2 |
| 5 | K2 |
| 6 | A2 |
| 7 | Z3 |
| 8 | K3 |
| 9 | A3 |

- This allows programs amounting more collectively than the available main memory are loaded, as only the pages required are loaded.

- All those pages, which are idle or inactive for the most time are marked by an O/S executive.

- When new pages are required to be loaded then marked inactive mem. pages are sent to HDD.

- When the memory is full, O/S doesn't deny loading more pages and starts making use of virtual memory.

- V.M has a limit and sometimes both v.m and M.M are full yet more pages are required to be loaded.

Situation requires:

1. Pages movement b/w V.M & M.M
2. Expansion of V.M

Main Memory

High rate of Disk Thrashing.

HDD read/write head movements.

Disk

VM

High rate of Thrashing.

HDD read/write head movements.

System is halted for the use and completely busy for paging in & out of main memory.

Thrash point.

Reduce the chance to HDD failure:

- By having more RAM installed
- By closing few currently running applications.