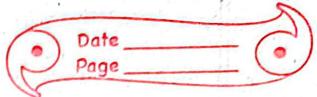


Assignment Task 2:



Write a short technical explanation along with diagrams on:

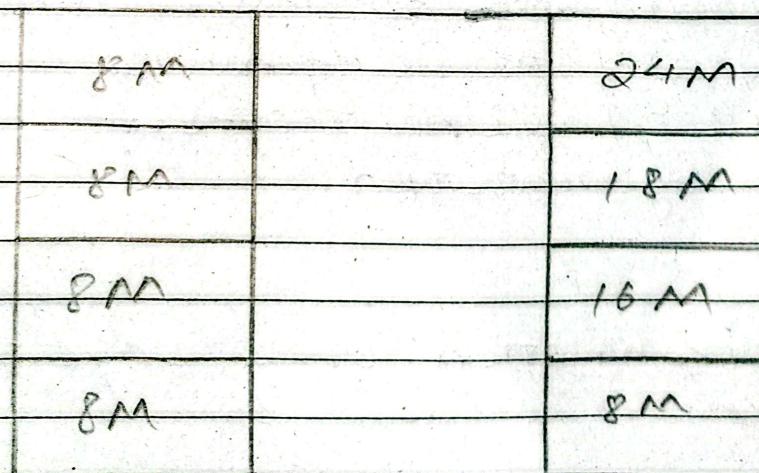
- a) Fixed partitioning vs variable partitioning.
→ The simplest way to manage available for the processes is to partition it into regions with fixed boundaries.

The partition may be equal sized or unequal sized. A process whose size is less than or equal to the partition size can be loaded into that partition. We divide the memory into several fixed size partition where each partition will accommodate only one program for execution.

Difficulties:

- A program maybe too big to fit into a partition,
- Main memory utilization is extremely inefficient causing (internal fragmentation).

Types: equal & unequal.

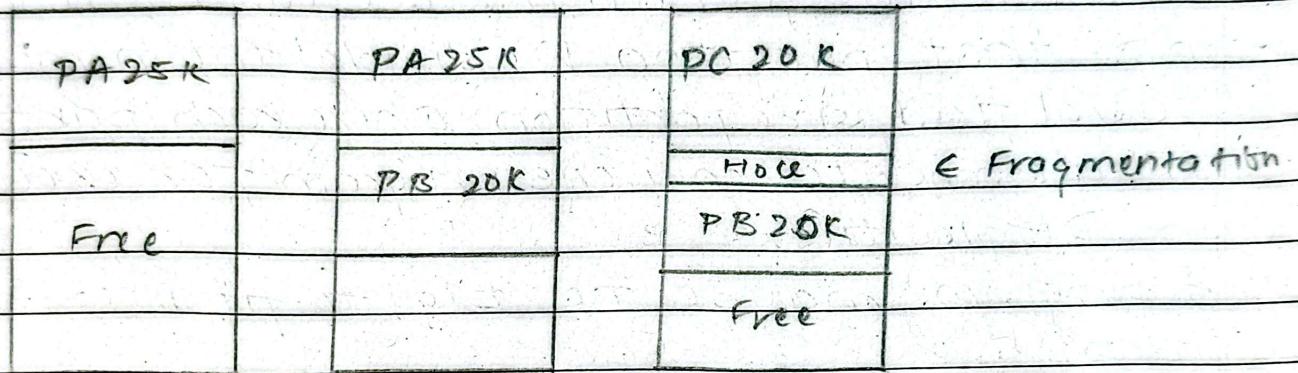


Equal size

Unequal size

⇒ Dynamic partitioning

In this method, partitions are created dynamically to meet requirements of each requesting process. Each process gets exactly the memory it needs. Reduces internal fragmentation but can create external fragmentation (scattered free memory). Given a new process, the OS must decide which hole to use for new process.



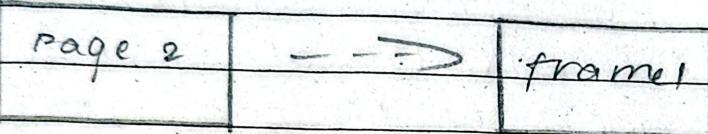
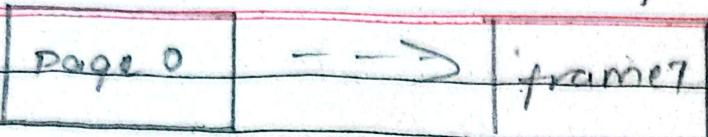
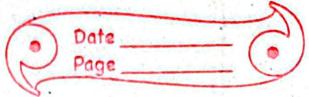
b) Paging vs segmentation

⇒ Paging

- Memory is divided into fixed size partition pages (logical) and frames (physical)
- Logical address = Page no. + offset
- No external fragmentation.
- features
- fixed size
- fast address translation using page table.

Logical
memory

Physical
memory

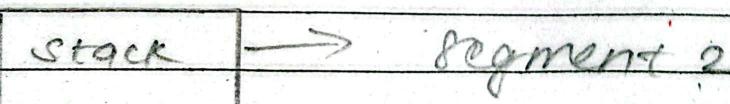
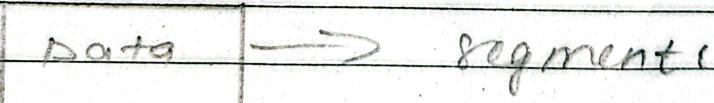
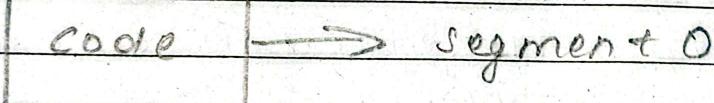


⇒ Segmentation.

- Memory is divided into variable size logical segments (code, data, stack)
- logical address = segment no. + offset
- matches program structure.

features:

- No internal fragmentation,
- can cause external fragmentation.



c) Logical Vs physical addressing.

→ Logical addressing (also called virtual address)
This is generated by the CPU during program execution. It is used by the program to access memory. The logical address doesn't correspond directly to physical address / memory. Programmer sees logical addresses. Logical addresses are mapped to physical addresses by the system.

CPU → Program instructions
logical address

→ Physical address

Physical address is the actual address in the main memory (RAM). It is determined after address translation by the memory management unit. Physical addresses are used by the hardware to fetch and store data. This is not visible to programmer. Hardware uses physical addresses to access data. This ensures process isolation and protection.

d) show how a logical address is translated into physical address in paging.

→ The CPU generates a logical address (page no. + offset). The memory management unit (MMU) translates it into a physical address.

