Unit 3 – Memory Management

- Need for MM – effective use of mem
- Main memory – Cache – See Memory
  – CPU Registers.
- Base – Limit Register
  (Phy. mem) (Length)
- Data & Inst Binding ⇒ 1. Compile time
  2. Load time
  3. Exe time

(Virtual Add) Logical Address – Genrated by CPU
Physical Address – in mem unit

Memory Mapping Unit
- MMU – maps Logical to Physical
- Dynamic Relocation – logical + reloc. Add (Base)
- Dynamic Loading – at runtime
  – load library (address of fns)
- Dynamic Linking – Stub – locate library routine
  Also called Shared Library → at runtime
- overlay – decide which instruction & data in memory.
- Swapping – process swapped out temporarily

Contiguous Allocation :-

Drawback

- Fixed Partitioning — Internal Fragmentation
- Variable Partitioning — Dynamic Storage-Allocation

Fixed Partitioning

- No of partition are fixed
- Each partition may not be same

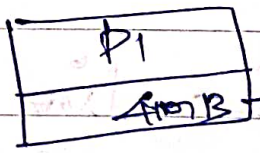
drawback: (fixed)

Internal Fragmentation.

↓

rem. blocks remain unused

P1 3MB



→ 1MB - unused

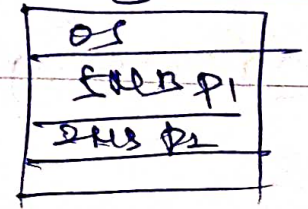
Sol: Dynamic Partition.

Variable Partitioning : Allocate how much process is asking

- Which part of mem. available
- Set of holes of various size

5MB P1 →

2MB P2 →



Process Size = Partition Size

Issue:
Drawback:- Dynamic Storage Allocation

how to satisfy a request of size n.

Sol:
First fit, Best fit, & Worst fit
- Strategies to select a free hole for

First fit - first hole that is big enough
Worst fit - largest hole first
Best fit - Smallest hole that is big enough

Drawbacks (Variable)

- Complex memory allocation - Allocate, Deallocate, Partition - keep track of partition
- External Fragmentation.

Not able to allocate
entire block (hole) left unused

Solution: - Compaction
merging all unused mem.

- Paging & Segmentation.