

# Operating System: Memory Management

By: Vishvadeep Gothi



# VISHVADEEP GOTHI SIR

**AIR- 19, 119, 440, 682  
in GATE**



**ME from IISc Bangalore  
Mtech BITS Pilani in Data  
Science**



**14+ Years of Teaching Experience,  
10+ Years in GATE/IES**



**Subjects Taken:**  
Computer Organization & Architecture,  
data structure, operating system,  
C-Programming, Data science,  
Machine Learning, Python,  
coding interview problems,





# Vishvadeep Gothi

#1 Educator in CS & IT · GATE & ESE

- GATE AIR-19, 119, 440, 682 - ME from IISc, - MTech BITS Pilani (Data Science) - 14 years experience

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28th JUNE - 03 JULY

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### Practice Sessions

28th June - 2nd July  
| 03:30 PM |

### Free Test

03rd July  
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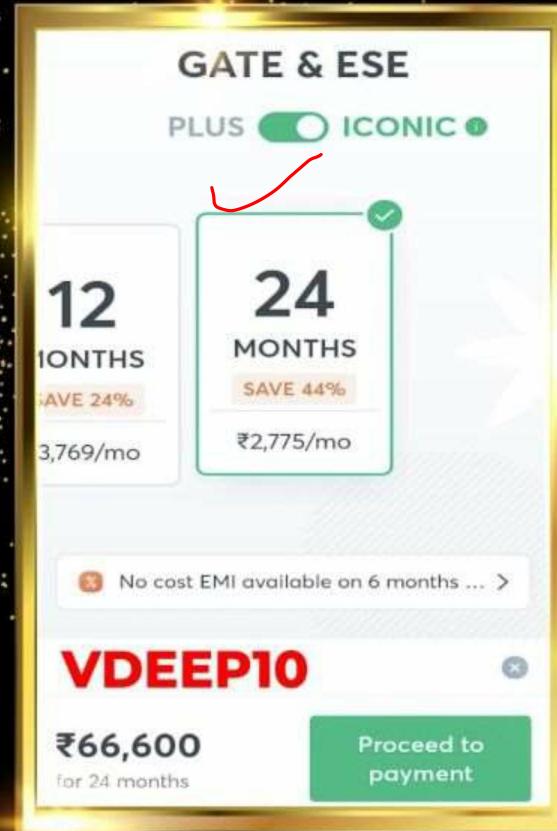
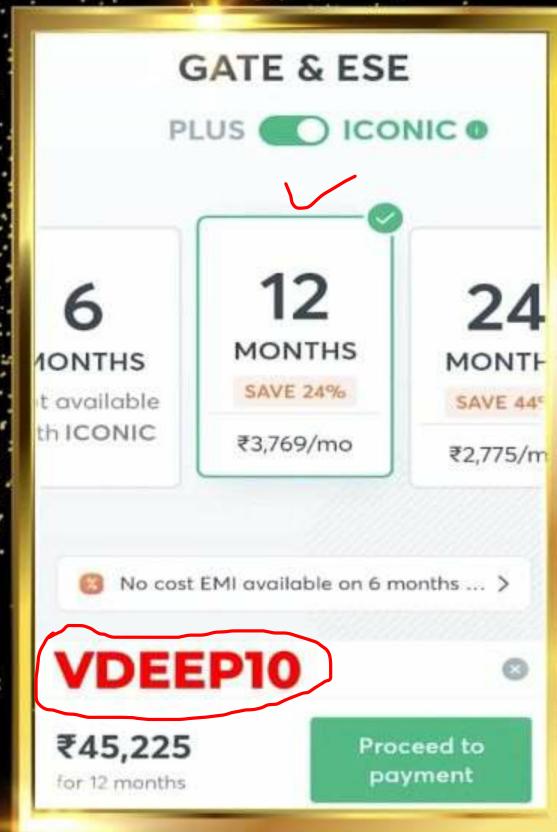
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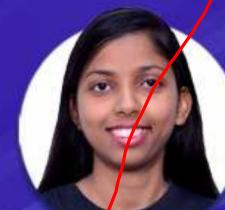
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# ✓ Memory Management

- Module of OS



# Functions of Memory Management

1. Memory allocation
2. Memory deallocation
3. Memory protection

# Goals of Memory Management

- ✓ 1. Maximum Utilization of space
- ✓ 2. Ability to run larger programs with limited space

→ (min. memory fragmentation)

↳ using virtual memory concept

# Memory Management Techniques

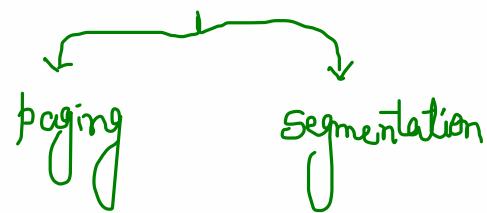
## Contiguous

entire process should be stored in mm on consecutive locations.



## Non-contiguous

process can be stored on non-consecutive locations.

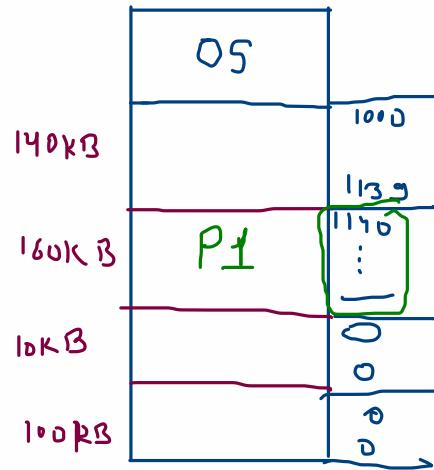


# Contiguous Memory Management

Entire process should be stored on consecutive memory locations

# Fixed Partition Contiguous MMT

The mm is divided into fixed no. of partitions and each partition can be used to accommodate max. one process.



# Fixed Partition Contiguous MMT

Max. degree of multiprogramming (no. of processes) is limited by number of partitions.

# Partition Allocation Policy

new process arrives , with size  $\Rightarrow$  50 kbytes

Partition allocat'n policy

1. First fit
2. Best Fit
3. Worst Fit
4. Next Fit

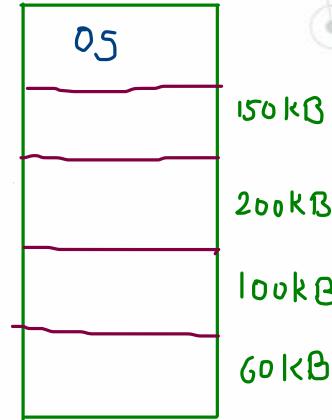
allocated partition

150 kB

60 kB

200 kB

100 kB if 200 kB partition  
was last allocated



# Partition Allocation Policy

whatever policy is used  $\Rightarrow$  There is internal fragmentation.

If extra space is allocated to process, more than required space. Hence wastage of that extra space is known as internal fragmentation.

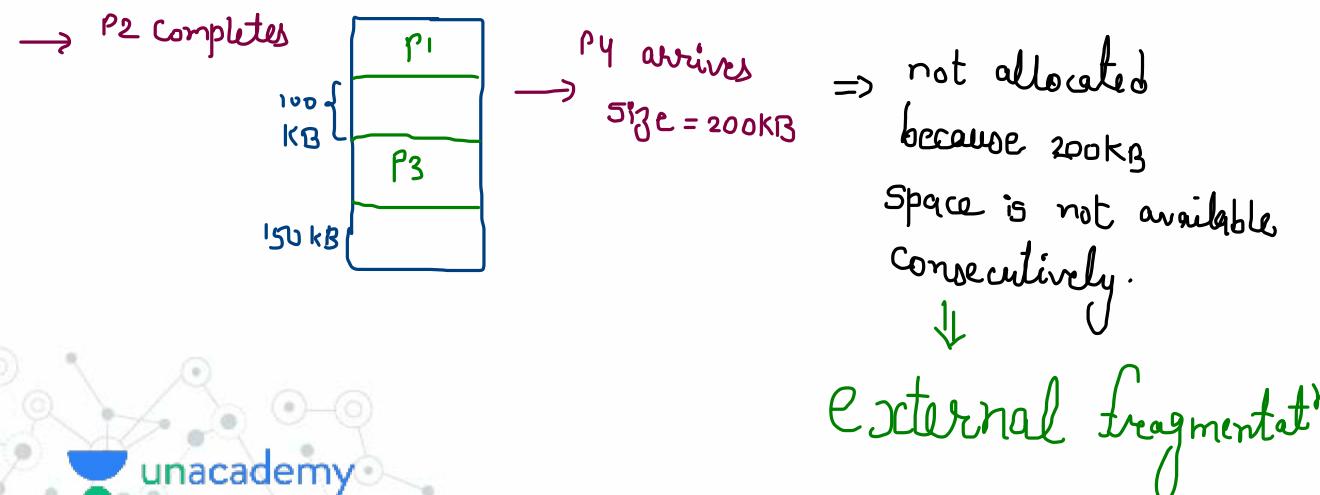
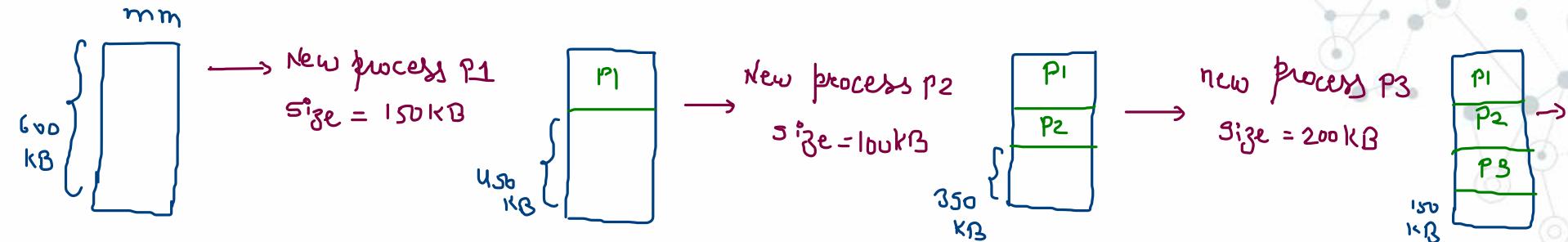
# Variable Partition Contiguous MMT

MM is not divided into partitions initially.

when a new process arrives, a new partition is created of same size as process size. & the process is allocated into that partition.

⇒ Hence no any internal fragmentation.

# Variable Partition Contiguous MMT



# Variable Partition Contiguous MMT

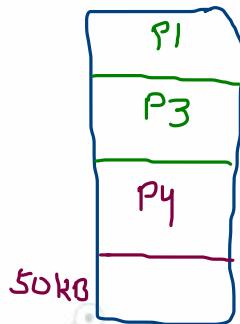
If enough space is available to store a process but not consecutive hence wastage of space is known as

External fragmentation.

Sol<sup>n</sup>  $\Rightarrow$  Compaction

time consuming

after compaction  $\Rightarrow$



Collect entire allocated processes into one side of memory, so that other free space can have entire

# Variable Partition Contiguous MMT

Suffers from external fragmentation

# Question (Homework) (Variable partition)

Consider the requests from processes in given order 300K, 25K, 125K, and 50K. Let there be two blocks of memory available of size 150K followed by a block size 350K. Which of the following partition allocation schemes can satisfy the above requests?

- A) Best fit but not first fit
- B) First fit but not best fit
- C) Both First fit & Best fit
- D) neither first fit nor best fit

# Solution



# Next Class

Non-Contiguous MMT

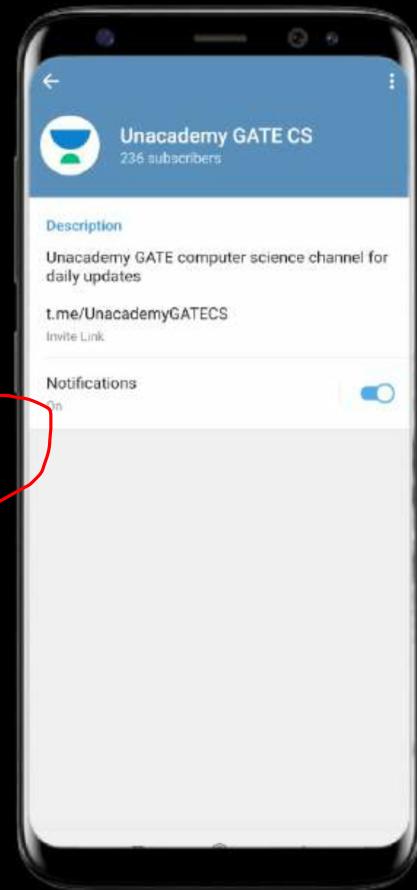


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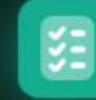


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SAVE 24%  
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24  
MONTHS

SAVE 44%  
₹2,775/mo

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