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**LEARNING ISSUE GUIDE: MEMORY MANAGEMENT**

**Suggested Scope:**

1. Logical Address Space vs. Physical Address Space
2. Memory Management Unit (MMU)

Given the logical address and relocation register, you must know how to calculate the physical address and identify if an addressing error will occur or not

3. Contiguous Memory Allocation
  - Single Partition / Multiple Partition
  - Allocation Algorithms – First-Fit, Best-Fit, Worst-Fit
  - Demonstrate how each algorithm works
  - Calculation of Internal & External Fragmentation
4. Non-Contiguous Memory Allocation
  - Paging
  - Segmentation

Describe what each of the above technique and explain how memory space is being allocated in each technique. Give examples to illustrate it.

**Suggested Practice Questions:**

Refer to Review Exercise 6

**Additional Practice Questions:**

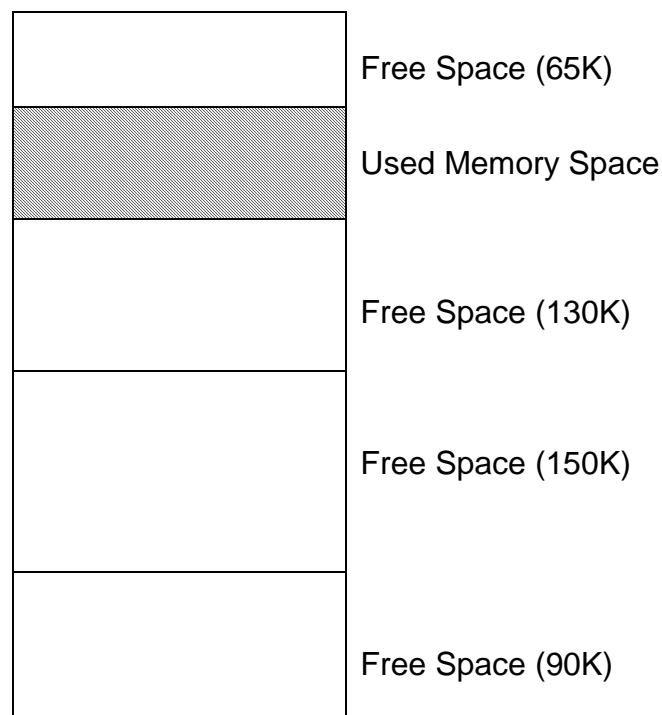
**(You can use this as an example in your peer teaching notes)**

a. The memory partitions of a computer system are shown below.

FOUR processes arrive in the order **P0**, **P1**, **P2** and **P3** of size 85K, 140K, 60K and 125K respectively.

Based on the **First-Fit** and **Best-Fit** allocation algorithms,

- draw and label the memory map to illustrate the allocated memory space for the processes.
- calculate the total amount of internal and external fragmentation for each allocation algorithm.
- state which processes, if any, cannot be loaded in the memory map.



**Figure C1**

b. For the **Worst-Fit** algorithm, a serious external fragmentation problem occurred because processes **P1** and **P3** cannot be loaded into the memory map.

Showing the memory map, explain how this problem can be overcome and name the technique that is used to overcome it.