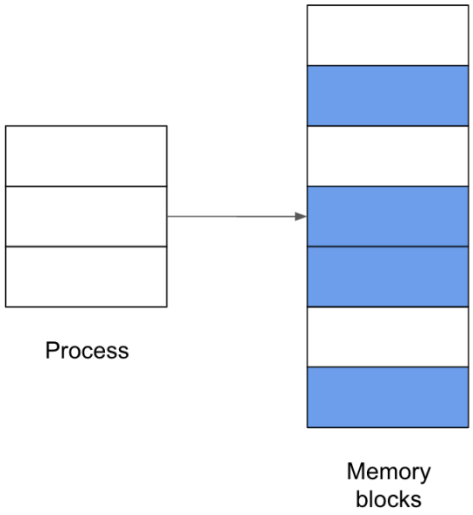
Assignment No: 2

Title:- Difference between Contiguous and Noncontiguous Memory Allocation

1. Contiguous Memory Allocation :

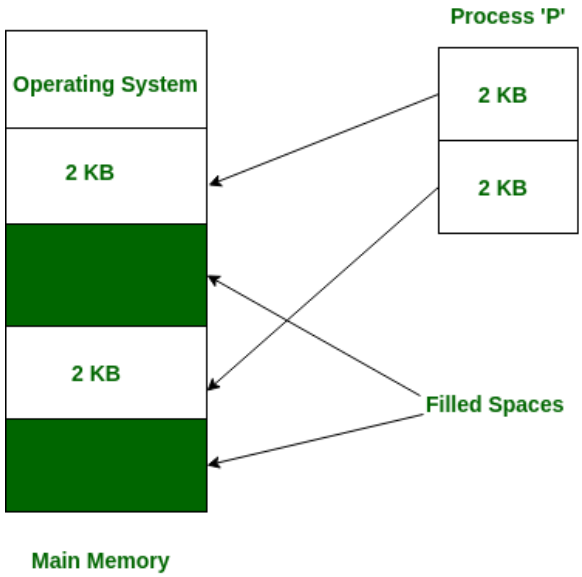
Contiguous memory allocation is a way of allocating a single contiguous section/part of memory to a process or file that requires it. As a result, all available memory space resides in the same location, which means that freely/unused available memory partitions are not dispersed randomly across the entire memory space.

The main memory is divided into two sections, one for the operating system and the other for user programmes. Contiguous memory allocation can be implemented/achieved by separating memory partitions into fixed size partitions.



2. Non-Contiguous Memory Allocation :

Non-contiguous memory allocation is a mechanism that, in contrast to contiguous memory allocation, allocates memory space present at different locations to the process based on its needs. Because all of the available memory space is distributed, the freely available memory space is also dispersed. This memory allocation strategy aids in reducing memory waste, which eventually leads to internal and external fragmentation.



Difference between Contiguous and Non-contiguous Memory Allocation :

Characteristic	Contiguous memory allocation	Non-contiguous memory allocation
Memory allocation	Allocates a single contiguous block of memory to a process.	Allocates multiple non-contiguous blocks of memory to a process.
Memory management	Simpler to manage.	More complex to manage.
Execution speed	Faster execution speed.	Slower execution speed.
Memory fragmentation	Both internal and external fragmentation can occur.	Only external fragmentation can occur.
Implementation	Can be implemented using fixed partitioning or variable partitioning.	Can be implemented using paging or segmentation.
Types	Fixed and Dynamic Partitioning	Paging, Multilevel Paging, Inverted Paging, Segmentation, Segmented Paging
Degree of multiprogramming	Fixed	Not Fixed
Wastage of memory	Yes	No
Control for OS	Easy to control	Difficult to control
Overhead	Minimum	Maximum
Advantages	Simpler to manage	Reduces memory fragmentation
Disadvantages	Can lead to memory wastage	Slower execution speed