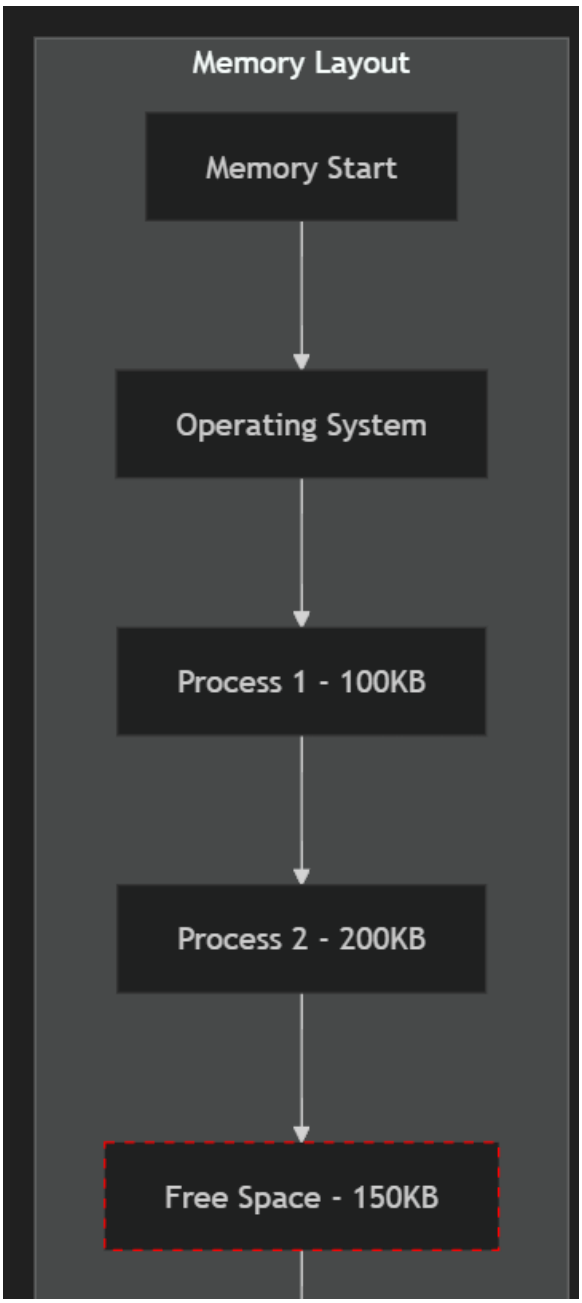
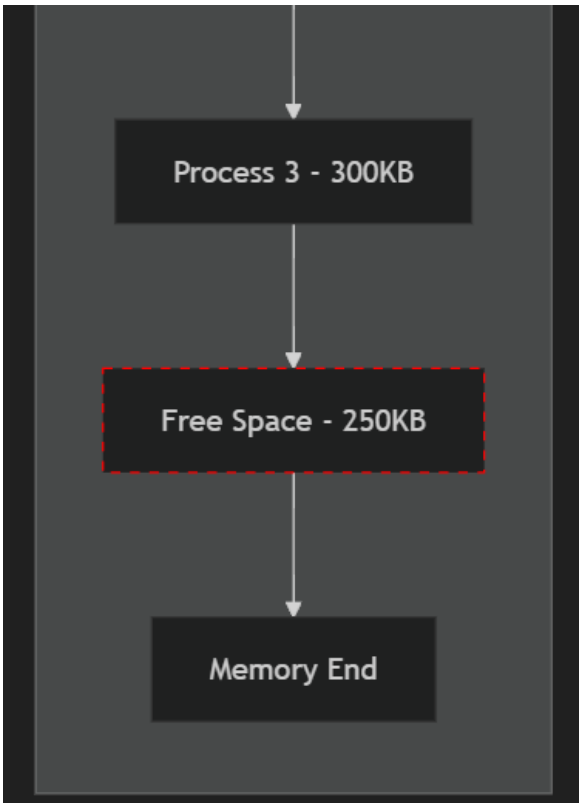
week10

A comprehensive diagram showing contiguous memory allocation along with its key concepts.

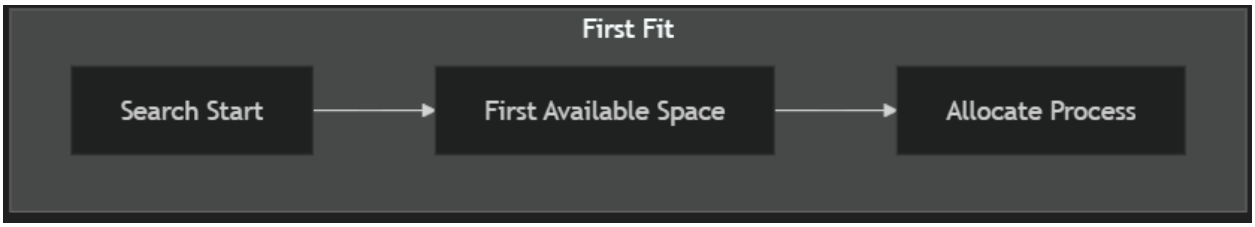


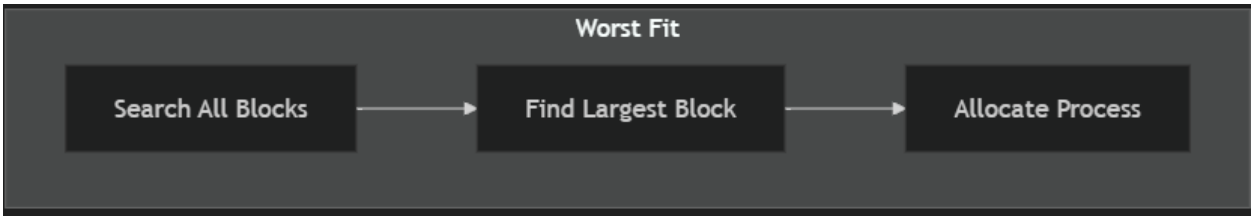


The key aspects of contiguous memory allocation as shown in the diagram:

1. Memory Organization:
    - Memory is divided into fixed-size or variable-size partitions
    - Each process is allocated a continuous block of memory
    - Processes are stored sequentially in memory
2. Key Elements in the Diagram:
    - Operating System space (reserved at the start)
    - Active Processes (Process 1, 2, and 3)
    - Free Space blocks (shown with dashed borders)
    - Memory boundaries (start and end)

Let's look at memory allocation methods:





Common Allocation Strategies:

1. First Fit:
    - Allocates the first available space that's large enough
    - Fast but can lead to fragmentation
    - Most commonly used method
2. Best Fit:
    - Searches entire memory for smallest sufficient block
    - Minimizes wasted space
    - Can be slower due to full memory search
3. Worst Fit:
    - Allocates largest available block
    - Leaves larger remaining spaces
    - Can be inefficient for memory utilization

Issues with Contiguous Memory Allocation:

1. External Fragmentation:
    - Small free spaces between allocated blocks
    - Total free space may be adequate but not contiguous
2. Internal Fragmentation:
    - Wasted space within allocated blocks
    - Occurs when allocated memory is larger than required
3. Memory Compaction:
    - Solution to external fragmentation
    - Combines scattered free space into one large block
    - Requires process relocation