File Allocation Strategies - Example Problems

1 Sequential Allocation

Problem Statement: Given a disk with 10 blocks (0-9), an initial file occupies blocks 2-4. The file grows by 2 blocks. If contiguous space exists, append to the file; otherwise, relocate it entirely. Print the success message with new allocation or a failure message.

Initial State:

Output Cases:

- If blocks 5,6 are free: **Allocation Success - File now occupies (2-6)**
- If no contiguous space: **Relocate file to another continuous block and print new range**
- If no space available: **Allocation Failed**

2 Indexed Allocation

Problem Statement: Given a file that uses indexed allocation, the index block at 1 points to allocated blocks {3,5,7}. The file grows by 2 more blocks. If space is available, update the index block and print success, else return failure.

Initial State:

Output Cases:

- If 2 free blocks exist: **Allocation Success - Updated index block points to new blocks**
- If not enough space: **Allocation Failed**

3 Linked Allocation

Problem Statement: A file is stored as linked allocation: $2 \rightarrow 5 \rightarrow 7$. The file grows by 2 blocks. If free blocks exist, update pointers and print success, else return failure.

Initial State:

Output Cases:

- If free blocks exist: **Allocation Success - File now links to new blocks**
- If no space available: **Allocation Failed**