

Program 9. Develop a C program to simulate the Linked file allocation strategies.

```
#include <stdio.h>
#include <stdlib.h>
#define MAX_BLOCKS 100
struct Block {
    int blockNumber;
    struct Block* next;
};

void initializeDisk(struct Block* disk[], int size) {
    for (int i = 0; i < size; i++) {
        disk[i] = NULL;
    }
}

void displayDisk(struct Block* disk[], int size) {
    printf("Disk Blocks:\n");
    for (int i = 0; i < size; i++) {
        printf("Block %d: ", i);
        struct Block* current = disk[i];
        while (current != NULL) {
            printf("-> %d ", current->blockNumber);
            current = current->next;
        }
        printf("-> NULL\n");
    }
}
```

```

int allocateBlock(struct Block* disk[], int size, int fileIndex, int blockNumber) {
    struct Block* newBlock = (struct Block*)malloc(sizeof(struct Block));
    if (newBlock == NULL) {
        printf("Memory allocation failed.\n");
        return 0;
    }
    newBlock->blockNumber = blockNumber;
    newBlock->next = NULL;

    if (disk[fileIndex] == NULL) {
        disk[fileIndex] = newBlock;
    } else {
        struct Block* current = disk[fileIndex];
        while (current->next != NULL) {
            current = current->next;
        }
        current->next = newBlock;
    }
    return 1;
}

```

```

int main() {
    struct Block* disk[MAX_BLOCKS];
    int diskSize = 10; // Change this to set the size of the disk
    initializeDisk(disk, diskSize);

    // Simulating file allocation
    allocateBlock(disk, diskSize, 0, 1);
    allocateBlock(disk, diskSize, 0, 3);
    allocateBlock(disk, diskSize, 1, 2);
}

```

```
allocateBlock(disk, diskSize, 2, 4);
allocateBlock(disk, diskSize, 1, 5);

// Display the disk after allocation
displayDisk(disk, diskSize);

return 0;
}
```

Output:

```
krishna@ubuntu:~/Documents/OS LAB/program9$ cc prg9.c
krishna@ubuntu:~/Documents/OS LAB/program9$ ./a.out
Disk Blocks:
Block 0: -> 1 -> 3 -> NULL
Block 1: -> 2 -> 5 -> NULL
Block 2: -> 4 -> NULL
Block 3: -> NULL
Block 4: -> NULL
Block 5: -> NULL
Block 6: -> NULL
Block 7: -> NULL
Block 8: -> NULL
Block 9: -> NULL
```