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Lab 1 - Implement Matrix manipulation

Consider the 2D representation for your chosen domain. Perform all data structure operations (insertion, Deletion, linear search) using 2D arrays for any chosen logical data of your domain. Implement any two matrix operations.

```c
#include <stdio.h>
#include <stdlib.h>

#define ROWS 3
#define COLS 3

struct matrixStruct
{
    char hotel_name[25];
    int bookings[ROWS][COLS];
};

struct matrixStruct hotel;

void insertionDisplay();
int deleteElement(int row, int col);
void displayMatrix();
int linearSearch(int value);
int main()
{
    int choice, value, count = ROWS * COLS, row, col;
    int continueMenu = 1; // A flag to continue the menu loop

    while (continueMenu)
    {
        printf("----------------------Hotel_Management--------------------------
\n");
        printf("Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0:
Exit): ");
        scanf("%d", &choice);

        switch (choice)
        {
        case 1:
            // Insert the hotel name
            printf("Enter Hotel Name :");
            scanf("%s", &hotel.hotel_name);
            printf("Enter the booking count received in the last %d days:\n",
count);
            insertionDisplay();
            break;
        case 2:
            // Delete the matrix
            printf("Enter the Row and Column of the matrix : ");
```

```
            scanf("%d %d", &row, &col);
            deleteElement(row - 1, col - 1);
            break;
        case 3:
            displayMatrix();
            break;
        case 4:
            printf("Enter the value to be searched :");
            scanf("%d", &value);
            linearSearch(value);
            break;
        case 0:
            continueMenu = 0; // Exit the loop
            break;
        default:
            printf("Invalid choice. Please try again.\n");
        }
    }

    return 0;
}
void displayMatrix()
{
    printf("----------------------3x3 Matrix of bookings--------------------------
\n");
    for (int i = 0; i < ROWS; i++)
    {
        printf(" ");
        for (int j = 0; j < COLS; j++)
        {
            printf("%d     ", hotel.bookings[i][j]);
        }
        printf("\n");
    }
}
void insertionDisplay()
{
    // Insertion hotel booking details
    for (int i = 0; i < ROWS; i++)
    {
        for (int j = 0; j < COLS; j++)
        {
            scanf("%d", &hotel.bookings[i][j]);
        }
    }

    // Display
    printf("----------------------Bookings of %s--------------------------
\n",hotel.hotel_name);

    for (int i = 0; i < ROWS; i++)
```

```
    {
        printf(" ");
        for (int j = 0; j < COLS; j++)
        {
            printf("%d     ", hotel.bookings[i][j]);
        }
        printf("\n");
    }
}
// Delete
int deleteElement(int row, int col)
{
    if (row >= 0 && row < ROWS && col >= 0 && col < COLS)
    {
        hotel.bookings[row][col] = -1; // Mark the element as deleted
        return printf("Element deleted\n");
    }
    return printf("Element not found\n");
}

// Linear search
int linearSearch(int value)
{
    printf("----------------------------Searching----------------------------------
\n");

    for (int i = 0; i < ROWS; i++)
    {
        for (int j = 0; j < COLS; j++)
        {
            if (hotel.bookings[i][j] == value)
            {
                return printf("value %d is found\n", value);
            }
        }
    }
    return printf("value is not found\n");
}
```

```
aaron@Aarons-Air Lab1 % ./matrix
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit): 1
Enter Hotel Name :Wowwww
Enter the booking count received in the last 9 days:
1
2
3
4
5
6
7
8
9
----------------------Bookings of Wowwww---------------------------
 1     2     3
 4     5     6
 7     8     9
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit): 2
Enter the Row and Column of the matrix : 1
2
Element deleted
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit): 3
----------------------3x3 Matrix of bookings---------------------------
 1     -1     3
 4     5     6
 7     8     9
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit): 4
Enter the value to be searched :9
------------------------------Searching-----------------------------------
value 9 is found
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit): 4
Enter the value to be searched :11
------------------------------Searching-----------------------------------
value is not found
----------------------Hotel_Management---------------------------
Enter your Choice (1: Insert, 2: Delete 3: Display,4: Searching, 0: Exit):
```