Data structures and Algorithms LAB – BSEF19

(Morning and Afternoon)

Lab 04 – 18-03-2021

Tasks 01 (20 marks)

Implement the following functions recursively and also write their tester main logic.

void replace(int **data, const int height, const int width, int sr, int sc, const int bc, const int fc)

Here, the function is similar to flood filling function; ***data*** is a 2D array of size ***height*** times ***width*** (have number of rows equal to its height and number of columns equal to its width), ***bc*** is the value at ***sr*** and ***sc*** (the starting point, row and column number within array ***data***). The function have to replace all connected neighboring elements of array have the same value ***bc*** stored in them with the value ***fc***.

Following is an illustration of replace(matrix, 8, 9, 2, 4, 2, 11)
Where matix is declared as **int matix[8][9]** *and may be passed as type casted pointer to the function*

1	1	1	1	1	**2**	1	1	2
2	2	8	**2**	**2**	**2**	**2**	1	1
2	8	8	**2**	**2**	5	7	8	2
2	8	8	**2**	9	**2**	**2**	8	3
4	4	0	**2**	9	**2**	6	**2**	**2**
0	4	**2**	**2**	9	**2**	**2**	**2**	5
9	4	**2**	**2**	**2**	**2**	**2**	**2**	4
0	4	4	4	4	4	5	4	4

Before replace

1	1	1	1	1	**11**	1	1	2
2	2	8	**11**	**11**	**11**	**11**	1	1
2	8	8	**11**	**11**	5	7	8	2
2	8	8	**11**	9	**11**	**11**	8	3
4	4	0	**11**	9	**11**	6	**11**	**11**
0	4	**11**	**11**	9	**11**	**11**	**11**	5
9	4	**11**	**11**	**11**	**11**	**11**	**11**	4
0	4	4	4	4	4	5	4	4

After replace

Tasks 02 (30 marks)

You are provided code for linked list as discussed in the class. Implement the following:

1. Remove the logical error in the erase function.
2. Write a member function of LinkedList class ***bool search(int x)***.
3. Implement the destructor of the LinkedList class.

----- The End ----