CS G526 – Advanced Algorithms and Complexity

Lab-1

Problem-1: Suppose you are given an NxN matrix with positive integers where each entry represents the pixel value. Given a pixel (x,y) and a value c, your goal is to replace the value at (x,y) and all connected adjacent pixels with the same value as in (x,y) with c.

Example: x=1, y=2, c=4

1	1	2	5
3	2	2	6
2	2	5	6
2	3	3	2

1	1	4	5
3	4	4	6
4	4	5	6
4	3	3	2

Write a C++/python program to solve this problem.

https://www.geeksforgeeks.org/breadth-first-traversal-bfs-on-a-2d-array/
https://www.geeksforgeeks.org/implementation-of-bfs-using-adjacency-matrix/
https://www.tutorialspoint.com/breadth-first-search-on-matrix-in-cplusplus

Problem-2: Given a Boolean 2D matrix of size n*m, find the number of island where a group of connected 1s forms an island.

Example:

1	1	0	1
1	1	0	1
0	0	0	1
1	1	1	1

Output: 2.

Write a C++/python program to solve this problem.