Extra Credit – Networks

Grid-Fill

Write a grid-fill program. Suppose you have a grid that contains randomly placed 0s and 1s as shown below. You should write a program that allows you to select a random cell that contains a 0 and flip that cell and all other adjacent cluster of cells that have 0 to 1, or, select a random cell that contains 1 and flip that cell and all adjacent cluster of cells that contain 1 to 0. To select the adjacent cell, consider neighbors in the left, right, top, and down directions only. You need not consider neighboring cells along the diagonals.

1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	1	1	1	1	1	0	1	1	1	1	0
0	0	1	1	0	1	1	0	0	1	0	0	0	1	0
0	0	0	0	0	1	1	0	0	1	0	1	1	1	0
0	0	0	0	0	1	0	0	0	1	0	1	0	0	0
0	**0**	1	1	1	1	0	0	0	1	0	1	0	0	0
0	0	1	0	1	0	0	0	1	1	0	1	0	0	0
0	0	1	0	1	1	1	1	0	0	0	1	0	0	0
0	0	1	0	0	1	0	0	0	0	0	1	1	0	0
0	0	1	0	0	0	0	0	1	1	1	1	0	1	0
0	0	1	1	1	1	1	1	1	0	0	0	0	1	0
0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

For example, in the above grid, if you select the highlighted cell that contains a 0, your program should flip that cell and all other adjacent cell that contains 0 to 1, as shown below. The modified cells are shown in bold.

1	**1**	**1**	1	0	0	0	0	1	0	0	0	0	0	0
1	**1**	**1**	1	0	0	0	0	1	0	0	0	0	0	0
1	**1**	1	0	0	0	0	1	0	0	0	0	0	0	0
1	**1**	1	0	1	1	1	1	1	0	1	1	1	1	0
1	**1**	1	1	**1**	1	1	0	0	1	0	0	0	1	0
1	**1**	**1**	**1**	**1**	1	1	0	0	1	0	1	1	1	0
1	**1**	**1**	**1**	**1**	1	0	0	0	1	0	1	0	0	0
1	**1**	1	1	1	1	0	0	0	1	0	1	0	0	0
1	**1**	1	0	1	0	0	0	1	1	0	1	0	0	0
1	**1**	1	0	1	1	1	1	0	0	0	1	0	0	0
1	**1**	1	0	0	1	0	0	0	0	0	1	1	0	0
1	**1**	1	0	0	0	0	0	1	1	1	1	0	1	0
1	**1**	1	1	1	1	1	1	1	0	0	0	0	1	0
1	**1**	**1**	**1**	**1**	**1**	1	0	0	0	0	0	0	0	1
1	**1**	**1**	**1**	**1**	**1**	1	0	0	0	0	0	0	0	0