

Assignment - 4

Matlab

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- (a) Create nine 2d arrays (using randi function) of dimension 3x3. They will have ranges [0,2], [3,5], [6,8],..., [24,26], respectively. Then concatenate them in any order (like in Assignment 9) to obtain a 9x9 matrix A1 (use for loops). Repeat the same process using ranges [21,23], [24,26], [27,29], ..., [45,47] and obtain another 9x9 matrix A2.

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

Example: concatenation of 9 3x3 arrays

- (b) From A1, create an undirected graph G1 with 9 nodes or vertices n_1, n_2, \dots, n_9 . Each node corresponds to a 3x3 array. Location of each node will be the center location of the corresponding array e.g. (2,2), (2,5), (8,2) etc. Label for each node will be the maximum value in the corresponding array. Every node will be connected using an edge to another node which is at left/ right/ bottom/ up neighboring location. The edge weights will be the absolute difference between the node labels. Similarly, create G2 (nodes m_1, m_2, \dots, m_9) from A2 with one change: Add 9 to x-coordinate and 2 to y-coordinate of node locations.
- (c) Create a bigger graph with 18 nodes from G1, G2. Now additionally connect nodes having same label.