Lab 4

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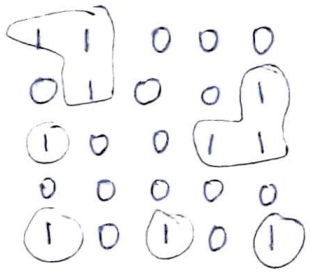
Question: Given a Boolean Matrix find number of Islands group of connected 1s form an island.

eg:



Ans = 6

Using union find.

Pseudocode: i) Let all 1's be as individual sets.

ii) If 1's are adjacent union them.

iii) After all 1's are visited check no of sets which is no of Islands.

```
int findIslands (vector<vector<int>> matrix)
{
        m = matrix.size();
        n = matrix[0].size();

    vector<pair<int, int>> paths =
    { {0,1}, {1,0}, {-1,0}, {0,-1},
      {1,1}, {-1,-1}, {-1,1}, {1,-1} };

    for (int i=0; i<m; i++)
    {   for (int j=0; j<n; j++)
        {   if (matrix[i][j] == 1)
            { int nx, ny;
            for (int k=0; k<8; k++)
            {   nx = x + ways[i].first;
                ny = y + ways[i].second;
                if (nx>=0 && ny>=0 && nx<m &&
                                ny<n)
                { if (matrix[nx][ny] == 1)
                  { union (ds[i][j],
                           ds[nx][ny]);
```

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~~return no of~~

3

```
vector<vector<int> a(m, vector<int>(n,0))
for (int i=0; i<m; i++)
    for (int j=0; j<n; j++)
        if a[i][j] == 1
            x = find(i,j);
            if (c[x] == 0)
                c[x]++;
                no. of_islands++;
            else
                c[x]++;
return no_of_Islands;
```