

ADS LAB - 4

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18M18CS024

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```
int countIslands (vector<vector<int>>&a) {  
    int n = a.size();  
    int m = a[0].size();  
    DisjointUnionSet *du = new DisjointUnionSet (n*m);  
    for (int j=0; j<n; j++) {  
        for (int k=0; k<m; k++) {  
            if (a[j][k]==0) continue;  
            if (j+1<n && a[j+1][k]==1)  
                du->union (j*(m)+k, (j+1)*(m)+k);  
            if (j-1>=0 && a[j-1][k]==1)  
                du->union (j*(m)+k, (j-1)*(m)+k);  
            if (k+1<m && a[j][k+1]==1)  
                du->union (j*(m)+k, (j)*(m)+k+1);  
            if (k-1>=0 && a[j][k-1]==1)  
                du->union (j*(m)+k, (j)*(m)+k-1);  
            if (j+1<n && k+1<m && a[j+1][k+1]==1)  
                du->union (j*(m)+k, (j+1)*(m)+k+1);  
            if (j+1<n && k-1>=0 && a[j+1][k-1]==1)  
                du->union (j*(m)+k, (j+1)*(m)+k-1);  
            if (j-1>=0 && k+1<m && a[j-1][k+1]==1)  
                du->union (j*(m)+k, (j-1)*(m)+k+1);  
            if (j-1>=0 && k-1>=0 && a[j-1][k-1]==1)  
                du->union (j*(m)+k, (j-1)*(m)+k-1);  
        }  
    }
```

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```
void Union (int x, int y) {  
    int xRoot = find(x);  
    int yRoot = find(y);  
    if (xRoot == yRoot)  
        return;  
    if (rank[xRoot] < rank[yRoot])  
        Parent[xRoot] = yRoot;  
    else if (rank[yRoot] < rank[xRoot])  
        Parent[yRoot] = xRoot;  
    else {  
        Parent[yRoot] = xRoot;  
        rank[xRoot] = rank[xRoot] + 1;  
    }  
}
```