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Section: A1

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DAA – TA : 6-11

1) Illustrate Union and Find Class of Java framework and its applications

<https://www.hackerearth.com/practice/notes/disjoint-set-union-union-find/>

Applications Of Union And Find:

1. To find connected components in a graph.
2. To detect cycle in undirected graphs.
3. Used to check if adding an edge will create a cycle.
4. Used in social networking to find manage dynamic connectivity.

2) Number of Operations to Make Network Connected

Problem Statement: You are given a graph with n vertices and m edges. You can remove

one edge from anywhere and add that edge between any two vertices in one operation. Find

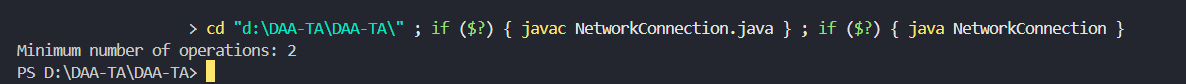
the minimum number of operations that will be required to make the graph connected. If it is

not possible to make the graph connected, return -1

Example 2:

Input Format: N = 9, M = 8, Edge[] =

[[0,1],[0,2],[0,3],[1,2],[2,3],[4,5],[5,6],[7,8]]



3) Problem Statement: Given a list of accounts where each element account [ i ] is a list

of strings, where the first element account [ i ][ 0 ]  is a name, and the rest of the

elements are emails representing emails of the account.

Now, we would like to merge these accounts. Two accounts definitely belong to the same

person if there is some common email to both accounts. Note that even if two accounts have

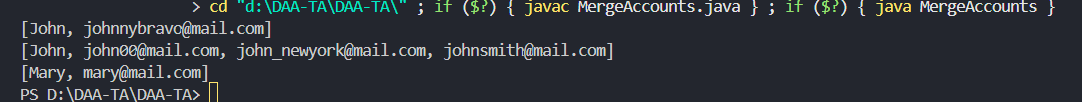
the same name, they may belong to different people as people could have the same name. A

person can have any number of accounts initially, but all of their accounts definitely have the

same name.

After merging the accounts, return the accounts in the following format: the first element of

each account is the name, and the rest of the elements are emails in sorted order.

Output: 

4) Bridges in Graph - Using Tarjan&#39;s Algorithm of time in and low time:

Problem Statement: There are n servers numbered from 0 to n - 1 connected by undirected

server-to-server connections forming a network where connections[i] = [ai, bi] represents a

connection between servers ai and bi. Any server can reach other servers directly or indirectly

through the network.

A critical connection is a connection that, if removed, will make some servers unable to reach

some other servers.

Return all critical connections in the network in any order.

A screen shot of a computer

AI-generated content may be incorrect.

5) Most Stones Removed with Same Row or Column

Problem Statement: There are n stones at some integer coordinate points on a 2D plane.

Each coordinate point may have at most one stone.

You need to remove some stones.

A stone can be removed if it shares either the same row or the same column as another stone

that has not been removed.

Given an array of stones of length n where stones[i] = [xi, yi] represents the location of the

ith stone, return the maximum possible number of stones that you can remove.

Output: A screenshot of a computer screen

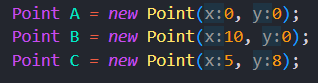
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6) Example and Code related to following topics

Steiner point in the graph.

Saddle point in the matrix.

Steiner Point: A point added to the graph to reduce the number of connections between a given set of points.



A computer screen with text

AI-generated content may be incorrect.

Saddle Point: A point in the matrix which is smallest in it’s row and largest in its column or vice versa.

A number and symbols on a black background

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OutputA computer screen shot of text

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