

## Competitive Programming

### Week-5.9(Assignment 1)Monday

#### Week 5-9 Implementing Disjoint Set Union -DSU for Connectivity Problems

##### Network Connectivity in an Online Service Platform

Code:

```
import java.util.*;

public class Main
{
    static int[] parent, rank;

    static int find(int x)
    {
        if (parent[x] != x)
        {
            parent[x] = find(parent[x]);
        }
        return parent[x];
    }

    static void union(int a, int b)
    {
        int pa = find(a);
        int pb = find(b);
        if (pa != pb)
        {
            if (rank[pa] < rank[pb])
            {
                parent[pa] = pb;
            }
        }
    }
}
```

```

        else if (rank[pb] < rank[pa])
        {
            parent[pb] = pa;
        }
        else
        {
            parent[pb] = pa;
            rank[pa]++;
        }
    }
}

static boolean connected(int a, int b)
{
    return find(a) == find(b);
}

public static void main(String[] args)
{
    Scanner sc = new Scanner(System.in);
    System.out.println("Number of Servers: ");
    int n = sc.nextInt();
    System.out.println("Number of Connections: ");
    int m = sc.nextInt();
    parent = new int[n];
    rank = new int[n];
    for (int i = 0; i < n; i++)
    {
        parent[i] = i;
        rank[i] = 0;
    }
}

```

```

    }

    System.out.println("Enter Connections: ");

    for (int i = 0; i < m; i++)
    {
        int u = sc.nextInt();

        int v = sc.nextInt();

        union(u, v);
    }

    System.out.println("Number of Connectivity Queries: ");

    int q = sc.nextInt();

    System.out.println("Enter Queries: ");

    for (int i = 0; i < q; i++)
    {
        int u = sc.nextInt();

        int v = sc.nextInt();

        if (connected(u, v))
        {
            System.out.println("YES");
        }

        else
        {
            System.out.println("NO");
        }
    }

    sc.close();
}
}

```

onlinegdb.com/#

OnlineGDB  
online compiler and debugger for c/c++

Welcome, 2303A51352

Create New Project  
My Projects  
Classroom **new**  
Learn Programming  
Programming Questions  
Upgrade  
Logout

About • FAQ • Blog • Terms of Use •  
Contact Us • GDB Tutorial • Credits •  
Privacy  
© 2016 - 2026 GDB Online

Main.java

```
1 - import java.util.*;
2 public class Main
3 {
4     static int[] parent, rank;
5     static int find(int x)
6     {
7         if (parent[x] != x)
8         {
9             parent[x] = find(parent[x]);
10        }
11        return parent[x];
12    }
13    static void union(int a, int b)
14    {
15        int pa = find(a);
16        int pb = find(b);
17        if (pa != pb)
18        {
19            if (rank[pa] < rank[pb])
20            {
21                parent[pa] = pb;
22            }
23            else if (rank[pb] < rank[pa])
24            {
25                parent[pb] = pa;
26            }
27            else
28            {
29                parent[pb] = pa;
30                rank[pa]++;
31            }
32        }
33    }
34    static boolean connected(int a, int b)
35    {
36        return find(a) == find(b);
37    }
38    public static void main(String[] args)
39    {
40    }
```

Language Java

27°C Sunny 11:43 18-02-2026

onlinegdb.com/#

OnlineGDB  
online compiler and debugger for c/c++

Welcome, 2303A51352

Create New Project  
My Projects  
Classroom **new**  
Learn Programming  
Programming Questions  
Upgrade  
Logout

About • FAQ • Blog • Terms of Use •  
Contact Us • GDB Tutorial • Credits •  
Privacy  
© 2016 - 2026 GDB Online

Main.java

```
38    public static void main(String[] args)
39    {
40        Scanner sc = new Scanner(System.in);
41        System.out.println("Number of Servers: ");
42        int n = sc.nextInt();
43        System.out.println("Number of Connections: ");
44        int m = sc.nextInt();
45        parent = new int[n];
46        rank = new int[n];
47        for (int i = 0; i < n; i++)
48        {
49            parent[i] = i;
50            rank[i] = 0;
51        }
52        System.out.println("Enter Connections: ");
53        for (int i = 0; i < m; i++)
54        {
55            int u = sc.nextInt();
56            int v = sc.nextInt();
57            union(u, v);
58        }
59        System.out.println("Number of Connectivity Queries: ");
60        int q = sc.nextInt();
61        System.out.println("Enter Queries: ");
62        for (int i = 0; i < q; i++)
63        {
64            int u = sc.nextInt();
65            int v = sc.nextInt();
66            if (connected(u, v))
67            {
68                System.out.println("YES");
69            }
70            else
71            {
72                System.out.println("NO");
73            }
74        }
75    }
```

Language Java

27°C Sunny 11:43 18-02-2026

OnlineGDB

online compiler and debugger for c/c++

Welcome, 2303A51352

Create New Project

My Projects

Classroom new

Learn Programming

Programming Questions

Upgrade

Logout

About • FAQ • Blog • Terms of Use •  
Contact Us • GDB Tutorial • Credits •  
Privacy

© 2016 - 2026 GDB Online

Main.java

```
70
71 =
72 {
73     {
74         System.out.println("NO");
75     }
76     sc.close();
77 }
78 }
```

Language Java

input

Number of Servers:  
6  
Number of Connections:  
4  
Enter Connections:  
0 1  
1 2  
3 4  
4 5  
Number of Connectivity Queries:  
3  
Enter Queries:  
0 2  
YES  
0 5  
NO  
3 5  
YES

27°C  
Sunny

Search

ENG  
IN

11:43  
18-02-2026