

```

#include <stdio.h>

struct disjointset
{
    int parent[10];
    int rank[10];
    int n;

}d;

void makeSet()
{
    for (int i = 0; i < d.n; i++) {
        d.parent[i] = i;
        d.rank[i]=0;
    }
}

void displaySet()
{
    printf("\nParent Array\n");
    for (int i = 0; i < d.n; i++)
    {
        printf("%d ",d.parent[i]);
    }
    printf("\nRank Array\n");
    for (int i = 0; i < d.n; i++)

```

```
    {  
        printf("%d ",d.rank[i]);  
    }  
    printf("\n");  
}
```

int find(int x)

```
{  
    if (d.parent[x] != x)  
    {  
        d.parent[x] = find(d.parent[x]);  
    }  
    return d.parent[x];  
}
```

void Union(int x, int y)

```
{  
    int xset = find(x);  
    int yset = find(y);  
    if (xset == yset)  
        { return; }  
    if (d.rank[xset] < d.rank[yset])  
    {  
        d.parent[xset] = yset;  
        d.rank[xset] = -1;  
    }  
}
```

```

        else if (d.rank[xset] > d.rank[yset])
        {
            d.parent[yset] = xset;
            d.rank[yset]=-1;
        }
        else
        {
            d.parent[yset] = xset;
            d.rank[xset] = d.rank[xset] + 1;
            d.rank[yset]=-1;
        }
    }
}

```

```

int main()
{
    int n,x,y;
    printf("How many elements ?");
    scanf("%d",&d.n);
    makeSet();
    int ch,wish;
    do
    {
        printf("\n___MENU_\\n");
        printf("1. Union \\n2.Find\\n3.Display\\n");
        printf("enter choice\\n");
        scanf("%d",&ch);
    }
    while(ch!=4);
}

```

```

switch(ch)
{
    case 1: printf("Enter elements to perform union");
            scanf("%d %d",&x,&y);
            Union(x, y);
            break;

    case 2: printf("Enter elements to check if connected components");
            scanf("%d %d",&x,&y);
            if (find(x) == find(y))
            {
                printf("Connected components\n") ;
            }
            else
            {
                printf("Not onnected components \n") ;
            }
            break;

    case 3: displaySet();
            break;

}

printf("\nDo you wish to continue ?(1/0)\n");
scanf("%d",&wish);

```

```
}while(wish==1);
```

```
return 0;
```

```
}
```

OUTPUT

How many elements ?4

___MENU_

1. Union

2.Find

3.Display

enter choice

3

Parent Array

0 1 2 3

Rank Array

0 0 0 0

Do you wish to continue ?(1/0)

1

___MENU_

1. Union

2.Find

3.Display

enter choice

3

Parent Array

0 1 2 3

Rank Array

0 0 0 0

Do you wish to continue ?(1/0)

1

____MENU_

1. Union

2.Find

3.Display

enter choice

2

Enter elements to check if connected components3

4

Not onnected components

Do you wish to continue ?(1/0)

1

___MENU_

1. Union

2.Find

3.Display

enter choice

2

Enter elements to check if connected components1

3

Not onnected components

Do you wish to continue ?(1/0)

1

___MENU_

1. Union

2.Find

3.Display

enter choice

2

Enter elements to check if connected components1

1

Connected components

Do you wish to continue ?(1/0)

0