

/*Given the Boolean Matrix of a Binary Relation, determine Whether the Relation is Reflexive and/or Symmetric.*/

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include <conio.h>
```

```
int checkRelation(int A[4][4])
```

```
{
```

```
    int i,j,ref=0;
```

```
    //Check Relation is reflexive and/or symmetric.
```

```
    for(i=0;i<4;i++)
```

```
    {
```

```
        for(j=0;j<4;j++)
```

```
        {
```

```
            if(i==j && A[i][j]==1)
```

```
            {
```

```
                ref++;
```

```
            }
```

```
        }
```

```
    }
```

```
    return ref;
```

```
}
```

```
int checkSymmetric(int A[4][4])
```

```
{
```

```
    int i,j,s=0;
```

```
    int flag=0;
```

```
    for(i=0;i<4;i++)
```

```
    {
```

```
        for(j=0;j<4;j++)
```

```
        {
```

```
            if(A[i][j] == A[j][i])
```

```
            {
```

```
                s=1;
```

```
            }
```

```
        }
```

```
    }
```

```
    return s;
```

```
}
```

```

int main()
{

    int i,j,n;
    int R[4][4] =
    {
        { 1,1,1,0},
        { 1,1,0,0},
        { 1,0,1,0},
        { 0,0,0,0}
    };
    clrscr();
    printf("\n Find whether the Relation is Reflexive and/or Symmetric \n");
    printf("\n A = { 1,2,3,4}");
    printf("\n\n Relation R = {(1,1),(2,2),(3,3),(2,1),(1,2),(1,3),(3,1)} \n");
    printf("\n Boolean Matrix of Relation R is:- \n Mr = \n");
    for(i=0;i<4;i++)
    {
        for(j=0;j<4;j++)
        {
            printf("%d ",R[i][j]);
        }
        printf("\n");
    }
    if(checkRelation(R)==4)
    {
        printf("\n\n Relation R is reflexive but not symmetric");
    }
    else if(checkSymmetric(R)==1)
    {
        printf("\n\n Relation R is symmetric but not reflexive");
    }
    else if(checkRelation(R)==4 && checkSymmetric(R)==1)
    {
        printf("\n\n Relation R is both reflexive and symmetric");
    }
    else

```

```
{  
    printf("\n\n Relation R is neither reflexive nor symmetric");  
}  
getch();  
}
```