**PROGRAM NO.:– 15**

**AIM:** **Write a program to implement graph colouring using backtracking.**

**SOURCE CODE:**

#include<stdio.h>

#include<conio.h>

int n,g[10][10],color[10];

int is\_safe(int i, int v)

{

int j;

for(j=0;j<n;j++)

{

if(g[v][j]&&i==color[j])

return 0;

}

return 1;

}

int graphcoloring(int m, int v)

{

int i;

if(v == n)

return 1;

for(i=1;i<=m;i++)

{

if(is\_safe(i,v))

{

color[v]=i;

if (graphcoloring(m,v+1) == 1)

return 1;

color[v]=0;

}

}

return 0;

}

void graphcolor(int m)

{

int i;

for(i=0;i<n;i++)

color[i]=0;

if(graphcoloring(m,0) == 0 )

{

printf("\n NO SOLUTION EXIST");

}

else

printf("\nColor assigned to graph: ");

for(i=0;i<n;i++)

{

printf("%d ",color[i]);

}

}

void main()

{

int m,i,j;

printf("Enter no . of vertices in graph:");

scanf("%d",&n);

printf("\nEnter Maximum no. of colours can be used:");

scanf("%d",&m);

printf("\nEnter adjacency matrix for graph:");

for(i=0;i<n;i++)

for(j=0;j<n;j++)

{

scanf("%d",&g[i][j]);

}

graphcolor(m);

getch();

}

**Output:**

