Algorithm : Welsh Powell for Graph Coloring

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1) **Example 1:**

```
C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell>a.exe
Number of vertices: 11
Number of edges: 22

Enter vertex pairs with edge in between : Eg. (0 1) -> Edge between V0 and V1
Edge1 :0 1
Edge2 :0 5
Edge3 :0 9
Edge4 :1 2
Edge5 :1 3
Edge6 :1 4
Edge7 :1 5
Edge8 :2 3
Edge9 :2 4
Edge10 :1 8
Edge11 :3 4
Edge12 :4 10
Edge13 :5 6
Edge14 :5 8
Edge15 :5 9
Edge16 :5 10
Edge17 :6 7
Edge18 :6 10
Edge19 :7 8
Edge20 :7 9
Edge21 :7 10
Edge22 :8 9
The vertices are colored in the following pattern:
Vertex 0 Color 6
Vertex 1 Color 1
Vertex 2 Color 2
Vertex 3 Color 7
Vertex 4 Color 3
Vertex 5 Color 2
Vertex 6 Color 4
Vertex 7 Color 2
Vertex 8 Color 4
Vertex 9 Color 5
Vertex 10 Color 5
Chormatic number is : 7
```

2) **Example 2:**

```
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell> ./a.exe
Number of vertices: 5
Number of edges: 6

Enter vertex pairs with edge in between : Eg. (0 1) -> Edge between V0 and V1
Edge1 :0 1
Edge2 :0 2
Edge3 :2 3
Edge4 :3 1
Edge5 :3 4
Edge6 :4 1
The vertices are colored in the following pattern:
Vertex 0 Color 3
Vertex 1 Color 1
Vertex 2 Color 1
Vertex 3 Color 2
Vertex 4 Color 3
Chormatic number is : 3
```

3) **Example 3:**

```
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell> ./a.exe
Number of vertices: 6
Number of edges: 9

Enter vertex pairs with edge in between : Eg. (0 1) -> Edge between V0 and V1
Edge1 :0 1
Edge2 :0 2
Edge3 :0 3
Edge4 :0 4
Edge5 :0 5
Edge6 :1 2
Edge7 :2 3
Edge8 :3 4
Edge9 :4 5
The vertices are colored in the following pattern:
Vertex 0 Color 1
Vertex 1 Color 4
Vertex 2 Color 2
Vertex 3 Color 3
Vertex 4 Color 2
Vertex 5 Color 3
Chormatic number is : 4
```

4) **Example 4 – Cyclic Graph:**

```
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell> ./a.exe
Number of vertices: 6
Number of edges: 6

Enter vertex pairs with edge in between : Eg. (0 1) -> Edge between V0 and V1
Edge1 :0 1
Edge2 :1 2
Edge3 :2 3
Edge4 :3 4
Edge5 :4 5
Edge6 :5 0
The vertices are colored in the following pattern:
Vertex 0 Color 1
Vertex 1 Color 2
Vertex 2 Color 1
Vertex 3 Color 2
Vertex 4 Color 1
Vertex 5 Color 2
Chormatic number is : 2
```

5) **Example 5:**

```
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell> gcc WelshPowell.c
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell> ./a.exe
Number of vertices: 4
Number of edges: 5

Enter vertex pairs with edge in between : Eg. (0 1) -> Edge between V0 and V1
Edge1 :0 1
Edge2 :0 3
Edge3 :2 3
Edge4 :0 2
Edge5 :1 2
The vertices are colored in the following pattern:
Vertex 0 Color 1
Vertex 1 Color 3
Vertex 2 Color 2
Vertex 3 Color 3
Chormatic number is : 3
PS C:\Users\sansk\Desktop\Sanskriti\College\GraphTheory\WelshPowell>
```