D2014 2.11.20

Monday, November 2, 2020 1:59 PM

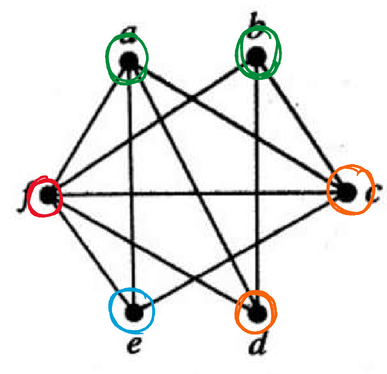
Welch Powell Algorithm :-

(i) Order (Arrange) all the Vertices of graph G according to decreasing Order of their degrees.

(ii) We assign the first Color C_1 to the Vertex which has maximum degree. then in Order assign C_1 to each vertex which is not adjacent to this Vertex.

(iii) Repeat step-2 with the second Color C_2 and the subsequence of non-color Vertices.

(iv) Repeat Step-3 with the 3rd Color C_3 and so-on untill all the Vertices are colored.



Find the chromatic Number of the graph by using Welch powell Algo.

Sol

$deg(a) = 4$ $\quad$ $deg(f) = 5$

$deg(b) = 3$

$deg(c) = 4$

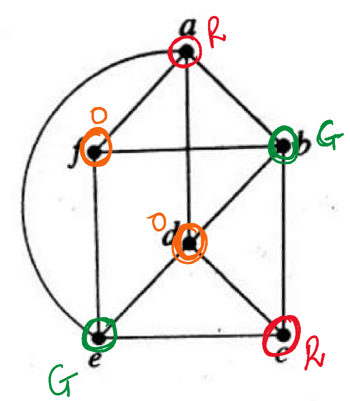
$deg(d) = 3$

$deg(e) = 3$

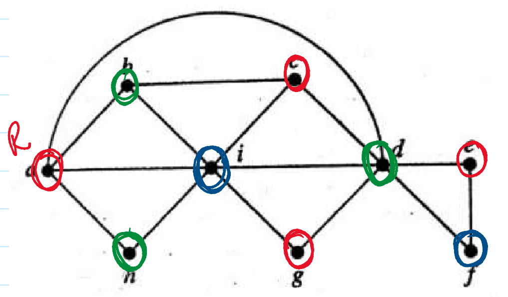
Degree	5	4	4	3	3	3
Vertex	f	a	c	b	d	e
Color	R	G	O	G	O	B

$\therefore$ Chromatic Number $= 4$

$$\boxed{\chi(G) = 4}$$



(a) 2 $\quad$ (b) ✓ 3 $\quad$ (c) 4 $\quad$ (d) 5



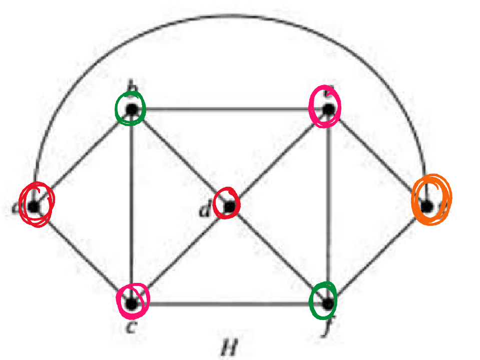
(a) — 2

(b) — 3 ✓

(c) — 4

(d) — 5

The chromatic number of the following graph is



(a) 6 (b) 2 (c) 4 ✓ (d) 3

The minimum number of colours required to colour the vertices of a cycle with η nodes in such a way that no two adjacent nodes have the same colour is

a) 2 ✓ (b) 3 ✓ (c) 5 (d) (a) or (b)

C_n — 2 if n is Even
— 3 if n is odd

Shortest path Problems :→

Dijkstra's Algorithm :→ Let S be the source set

(i) Initially there is no Vertex in S

(ii) Include a source Vertex V_s in S. Find all the path from V_s to all other Vertices without going through any other Vertex

(iii) Include that Vertex in S which is nearest to V_s and find shortest path to all the Vertices through this Vertex and update the Values

(IV) Repeate the step(iii) Untill $(n-1)$ Vertices are not included in S if there are n Vertices in the graph

After Completion of process we get the shortest path to all the Vertices from the source Vertex.

from the source vertex.