ALGORITHM TO FIND MAXIMUM NUMBER OF EDGE COLORING.

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Abstract :

A graph G be a mathematical structure consisting of two set vertices of G (V (G)) and edge of G (E (G)). Graph Coloring is one of the popular and broadly researched subject in Graph theory .Now we dicuss about the edge coloring of some graph using algorithm.

Key Word:

Graph coloring, edge coloring, algorithm to find edge coloring.

Introduction:

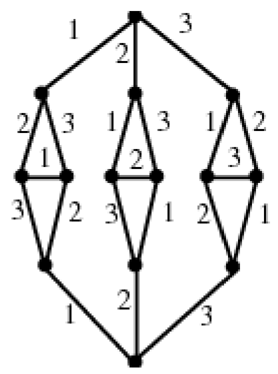
In Graph theory, **Graph coloring** is a special case of Graph labeling; it is an assignment of labels traditionally called "colors" to element of a Graph subject to certain constraint. In its simplest form, it is a way of coloring the vertices of a graph such that no two adjacent vertices share the same color; this is called a **vertex coloring.** Similarly, an edge coloring assigns a color to each edge so that no two adjacent edge share the same color, and a face that share a boundary have the same color.

Vertex coloring is the starting point of the subject, and other coloring problem can be transformed into a vertex version .for example, an edge coloring of a graph is just a vertex coloring of its line graph , and a face coloring of a plane graph is just a vertex coloring of its dual.

Edge coloring:

An **edge coloring** of a graph is a proper coloring of the edges, meaning an assignment of colors to edge so that no vertex is incident to two edges of the same color. An edge coloring with κ-colors is called a κ-edge-coloring and is equivalent to the problem of partitioning the edge set into κmatchings.The smallest number of colors needed for an edge coloring of a graph G is the **chromatic index** , or **edge chromatic number** ,χ'(G).

EXAPMLE:



Edge coloring

ALGORITHM:

STEP 1:

Start node, finding the maximum degree and number of edge of the graph.

Maximum of the degree = n.

Number of edges = m.

STEP 2:

For $i = 1; i \leq m; i++)$

Color (e_i) =min {set of total color used –colors of adjacent edge of e_i}

Where the set of total color used = {1,2,3,….n}

If

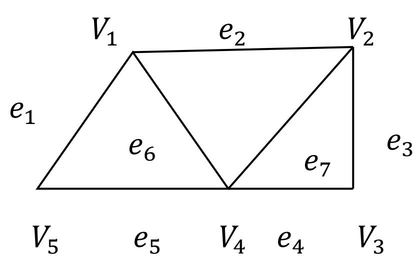
Color (e_i) ==0

Color (e_i) =n+1

STEP 3:

End node

EXAMPLE:



STEP 1:

Maximum degree = n= 4

No of degree m =7

STEP 2:

For i =1,1≤7

Color (e_1) = min {{1,2,3,4}-{0}}

Color (e_1) = min {{1,2,3,4}}

Color (e_1) = 1

STEP 3:

For i =2,2≤7

Color (e_2) = min {{1,2,3,4}-{1}}

Color (e_2) = min {{2,3,4}}

Color (e_2) = 2

STEP 4:

For i =3,3≤7

Color (e_3) = min {{1,2,3,4}-{2}}

Color (e_3) = min {{1,3,4}}

Color (e_3) = 1

STEP 5:

For i =4,4≤7

Color (e_4) = min {{1,2,3,4}-{1}}

Color (e_4) = min {{2,3,4}

Color (e_4) = 2

STEP 6:

For i =5,5≤7

Color (e_5) = min {{1,2,3,4}-{1,2}}

Color (e_5) = min {{3,4}}

Color (e_5) = 3

STEP 7:

For i =6,6≤7

Color (e_6) = min {{1,2,3,4}-{1,2,3}}

Color (e_6) = min {{4}}

Color (e_6) = 4

STEP 8:

For i =6,7=7

Color (e_7) = min {{1,2,3,4}-{1,2,3,4}}

Color (e_7) = min {{0}}

Color (e_7) = 0 (if condition)

Color (e_7) = 5

The colors of the edges are tabulated below :-

EDGES	(e_1)	(e_2)	(e_3)	(e_4)	(e_5)	(e_6)	(e_7)
COLORS	1	2	1	2	3	4	5

CONCLUSION :

In this paper we discuss about a new algorithm and an example.

Also we discuss how to find maximum coloring for edges for a graph.

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