

THE DIB-CHROMATIC NUMBER OF DIGRAPHS

NAHID YELENE JAVIER NOL

Universidad Autónoma Metropolitana-Iztapalapa

e-mail: nahid@xanum.uam.mx

A coloring of a graph G is *proper* if each color class induces an empty subgraph. A *b-coloring* of a graph G with k colors is a coloring of the vertices of G such that in each color class there exists a vertex having neighbors in all the other $k - 1$ color classes. Such a vertex will be called a *b-vertex*. The *b-chromatic number* $b(G)$ of a graph G is the largest k for which G has a proper b -coloring with k colors. A coloring of a graph G is *complete* if for every pair of colors i and j there exists an edge uv such that u is colored i and v is colored j .

We consider simple, loopless, and finite digraphs. A *digraph* D is a pair (V, A) where V is the set of vertices and A is the set of arcs. An *arc* is a pair (u, v) of vertices, for short we write uv . A *coloring* of a digraph D is *acyclic* if each color class induces a subdigraph without directed cycles.

A coloring of a digraph D is *complete* if for every pair of different colors (i, j) there exists at least one arc uv such that u is colored i and v is colored j .

Let u and v be two vertices of a digraph D such that uv is an arc of D . We say that u is *incident to* v and v is *incident from* u .

A vertex u is called a *b⁺-vertex* with respect to a coloring φ of a digraph D if u is incident to a vertex colored with each color different from the color of u . Analogously, a vertex v is a *b⁻-vertex* with respect to φ if v is incident from a vertex colored with each color different from the color of v .

A *b-coloring* of D is a coloring of D such that each color class contains a *b⁺-vertex* and a *b⁻-vertex*. We define the *dib-chromatic number* of D , denoted by $dib(D)$, as the largest k such that D admits an acyclic b -coloring with k colors.

In this talk, we introduce the concept of the dib-chromatic number of a digraph, which is a generalization of the b-chromatic number of a graph. We give general bounds for this parameter. We also show some results about tournaments and regular digraphs