

Even the Patriots can win Atlantic 10!

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Abstract

Are you wondering whether the GMU Patriots could ever win the Atlantic 10 Conference regular season title? The answer is yes, they could. All you need to do is to change the tournament format slightly.

An *incomplete handicap tournament* of n teams ordered according to their rankings $1, 2, \dots, n$ (where the strongest team is ranked 1 and the weakest team is ranked n) is an r -regular graph in which the *total opponents ranking* of team i (which is the i -th ranked team), $w(i)$, is the sum of rankings of all opponents (i.e., the neighbors) of i and $w(1), w(2), \dots, w(n)$ is an increasing arithmetic progression with common difference 1. In other words, the strongest and highest ranked team 1 with the smallest $w(i)$ has highest ranked (and therefore strongest) opponents and thus the most difficult schedule while the weakest team, ranked n -th, has the weakest opponents and hence the easiest schedule.

We will show how to construct regular handicap tournaments as well as other types of incomplete tournaments, where each team has the same strength of schedule, or where the strongest team has the weakest schedule (as it happens in complete round robin).

Keywords: Distance magic graph labeling, handicap labeling, tournament scheduling.