Order and ranking via matracies essay

Throughout human history the spirit of competition has been a large part of human society and lifestyle. The whole point of competition is for there to be a clear winner that asserts themselves above the rest, however it is not always the case that a clear winner can be defined. When this occurs the use of dominance matrix is best used to represent the given data in a clear ranking order so that a winner can be determined.

The Brisbane sports association has devised a points system that award teams for wins and draws, this system was used to appoint points to six teams in a mound robin competition however they were not enough to define a clear winner. English premier league results: As seen in this original table: the English premier league points system places the dingo's as the overall winner with three wins and one draw. This table is inaccurate in its representation of a clear winner as it does not show inter team interactions and bases itself on only three factors(wins losses and draws).

The English premier league rewards 1 point for a draw O points for a loss and 3 points for a win. The dominance matrix form for the results using this system is: defined as ' r') The alternate dominance matrix used rewards O points for a loss, 1 point for a draw and 2 points for a win. The matrix incorporating this system is: (defined as ' d') To make the matrix more reliable in its representation of a ranking order ; more factors should be taken into account. The current data represents which team won against who, the transposed matrix would show which team lost against who.

Showing wins take losses would be seen as the transposed matrix taken from the original point matrix. This would give rank order dominance for

each team. The atria is multiplied by a six by one matrix containing ones as it only value; this ensures that the matrix gives final result values to determine a ranking. Both dominance matrices give the same order of ranking however first order dominance does not give a clear winner contains one tie for each matrix. Second order dominance breaks the ties and gives a clear ranking from first to last place.

Both the alternative dominance matrix and the English premier league point system matrix give the same rank order. The system of 1st order ranking +0. 5 2nd order +0. 25 3rd order verifies the ranking yester of 2nd order as it gives the same ranking from first to last place. This validates the accuracy of 2nd order dominance for this competition. It is still evident that the ranking for the English premier league points system matrix gives the same ranking as the alternative point system matrix. Comparing these matrices to the original data in the original points table shows a difference in rankings.

However when comparing the English premier league matrix with the alternate point matrix it can be seen that while the order in ranking is the same, the PL matrix shows a greater separation in team performances. This is due to the greater advantage placed in winning a game. The rankings are the same for both matrices: Echidna 1 1st I Platy 1 3rd I Wombats 1 5th I Goanna 1 4th I 1 6th I Emus Dingo's 1 2nd I Strengths: The model takes into account 3 factors to enable an accurate and reliable representation of the competition.

The model shows interactions between the competing teams instead of individual performances only. It does this by not Just showing raw values but

represents how teams performed against each other (which team lost/ won/ drew against who). The model shows a direct ranking from first to sixth place. The model takes represents not only which teams won against who but also which teams lost against who which further explores inter team interactions and raises the accuracy of the model. Weaknesses: The model does not account for any fouls or other performance affecting statistics.

The model does not account for points scored against individual teams or the total points scored during the whole competition. The model does not account for player misconduct or other punishable offenses(games lost due to players rioting/ misbehaving). Assumptions: It is assumed that when a team plays against themselves it is counted as a loss instead of being marked as a draw or other value. It is assumed that wins were earned only by winning instead of byes or forfeits. It is assumed that the same players were kept on during the whole competition It is assumed that each game was played in the same neutral stadium.

Effects of assumptions: Because a loss is given to a team when they vs.. Themselves, when a team is inputted against themselves in the matrix the team has mathematically lost to themselves; giving the team that beats them first and second order dominance over them. It is assumed that each game was played in the same neutral stadium so that no team as a home ground advantage It is assumed that wins were earned only by winning instead of byes or forfeits because a team forfeiting to another doesn't indicate that the team is better or more skilled.

Limitations: The data is limited to one round robin rotation. The data is limited to a six team competition The matrix is limited to only wins, draws and losses The data is limited as it does not give information about fouls/ penalties or other data that represents the team's performance. Validation: the matrix and ranking is fair for all players in the competition as it does tot Just account for the number of points gained from wins/draws but also shows to which teams these wins were had and to which teams losses were had.

By analyzing to which teams the others lost/ won to the matrix takes into account inter team interactions instead of trying to rank the teams by simply how many points were earned. By taking into account multiple factors the matrix offers more information and therefore a more accurate representation on team performances. Part S: 8 teams competed in a round robin completion for Queensland hockey. The teams played most of their games however some matches were cancelled leaving the draw incomplete. To rank the teams on the given information about their performances a dominance matrix will be used.

To matrix will incorporate the English premier league points system and unplaced games will be counted as a loss. To make up for the missing data the dominance matrix of wins ties and losses will be added to an individual point matrix containing the points scored each games so that the teams can be ranked based on not only the number of games won but how many points were won during these games. A point matrix will be used instead of a transposed matrix since the transposed matrix represents losses and since an unplaced game is mounted as a loss the transposed matrix would severely penalize those who have had a cancelled match.

The win/loss matrix is defined as ' b'. The points matrix is defined as' up'. UP: points/goals per game matrix B: win/loss matrix Ranking: stars 1 8th I galaxies 1 7th I nebulas 1 1st I comets 1 4th I Moons 1 2nd I Suns 1 5th I Meteors 1 3rd I Asteroids 1 6th I The second order ranking gives a definite ranking from first to eighth place. The ranking is defined as ABA+ 0. IPPP where b is the win/loss matrix for the eight team competition and up is the individual point matrix. This order ensures that not only he points gained from winning are counted but also the individual points gained from goals each game.

Not only does this give further information about each team's performance but it also shows how many goals each team scored against each other showing inter team interactions, which gives a more accurate ranking. This is validated by the ranking order of first order plus 0. 5 second order+O. 25 third order ranking. Takes into account the number of goals each team won or lost their games by Shows a ranking from 1st to 8th place Validated by second ranking system with same rank order (1st order ranking +0. 2nd order +0. 25 3rd) Weaknesses: The model cannot account for a non- play and instead inputs a loss instead of non- applicable data.

The data is incomplete The model does not account for losses (transposed matrix) It is assumed that when two teams miss a game the resulting point is a loss It is assumed that each team had even home and away games It is assumed that wins were earned only by winning instead of byes or forfeits. Effects of Assumptions: It is assumed that each team had even home and away games so that no team had an unfair amount of home game advantage The Missed games could result in a draw indicating that both

teams scored equal points of zero however by assuming that missed games are a loss some teams are disadvantaged.