NANKAI UNIVERSITY

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A MODIFIED BORDA COUNT (MBC) EXPERIMENT

31ST October, 2013

**The Analysis**

At a lecture given by the de Borda Institute to post-graduate students in the Zhou Enlai School of Government of Nankai University, participants took part in a Modified Borda Count, (MBC), on the question of which country is to host the 2024 Olympics. A number of countries have already expressed an interest in placing a bid, and from these a short list if six was used as the basis of the ballot.

Total number of ballots: 17

Number of valid ballots: 17

Number of full ballots: 14

Number of partial ballots, (two of 4 preferences, one of 2 preferences): 3

Theoretical maximum number of points, 17 x 6 = 102 102

 consensus coefficient, 102/102 = 1 1

Theoretical minimum number of points (if all full ballots), 17 x 1: 17

 consensus coefficient, 17/102 = 0.166 0.17

Theoretical average number of points (if all full ballots): 59.5

 consensus coefficient: 0.58

The vote audit was as follows:

|  |  |
| --- | --- |
| Options | Preferences cast by each of 17 voters |
| A | Canada | 3 | 1 | 4 | 3 | 2 | 2 | 2 | 5 | 6 | 2 | 1 | 2 | 4 | 2 | 1 | 2 | 3 |
| B | France | 1 | - | 3 | 2 | 4 | 1 | 3 | 6 | 4 | 1 | 4 | 3 | 1 | 1 | 3 | 4 | 6 |
| C | Kenya | 6 | - | 5 | 6 | - | - | 6 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 4 | 6 | 4 |
| D | Russia | 5 | - | 1 | 4 | 3 | 3 | 5 | 4 | 5 | 3 | 5 | 4 | 5 | 4 | 2 | 3 | 2 |
| E | Taiwan | 2 | 2 | 2 | 1 | 1 | - | 1 | 2 | 3 | 4 | 2 | 1 | 2 | 3 | 5 | 5 | 1 |
| F | Turkey | 4 | - | 6 | 5 | - | 4 | 4 | 3 | 2 | 5 | 3 | 5 | 3 | 5 | 6 | 1 | 5 |

So the voters’ profile is as follows:

|  |  |
| --- | --- |
| Options | Numbers of preferences cast |
| 1st  | 2nd  | 3rd  | 4th  | 5th  | 6th  |
| A | Canada | 3 | 7 | 3 | 2 | 1 | 1 |
| B | France | 5 | 1 | 4 | 4 | - | 2 |
| C | Kenya | 2 | - | - | 2 | 1 | 9 |
| D | Russia | 1 | 2 | 4 | 4 | 5 | - |
| E | Taiwan | 5 | 6 | 2 | 1 | 2 | - |
| F | Turkey | 1 | 1 | 3 | 3 | 5 | 2 |

This would suggest that Canada is fairly popular, as is France; Kenya is not a popular choice; Russia is lukewarm; Taiwan is a favourite, but not overwhelmingly; and Turkey is also lukewarm.

The results of the count are as follows:

|  |  |
| --- | --- |
| Options | MBC |
| Points | Consensuscoefficient |
| A | Canada | 66 | 0.65 |
| B | France | 61 | 0.60 |
| C | Kenya | 29 | 0.28 |
| D | Russia | 51 | 0.50 |
| E | Taiwan | 68 | 0.67 |
| F | Turkey | 42 | 0.41 |

So Taiwan is indeed the winner.

**A Comparison**

By way of comparison, the following table shows the results as per other counting methodologies. Winning options (or joint winners) are shown in red; runners-up are in yellow.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Options | Plurality voting | Two-roundvoting | Alternativevote(AV) | Approval voting\* | BordaCount(BC) | MBC | Condorcet |
| A | Canada | 3 |  |  | 17 | 75 | 66 | 4 |
| B | France | 5 | 7 | 7 | 16 | 65 | 61 | 3 |
| C | Kenya | 2 |  |  | 14 | 29 | 29 | - |
| D | Russia | 1 |  |  | 17 | 59 | 51 | 2 |
| E | Taiwan | 5 | 9 | 9 | 15 | 70 | 68 | 5 |
| F | Turkey | 1 |  |  | 13 | 44 | 42 | 1 |

The social rankings are as follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Options | Plurality voting | Two-roundvoting | Alternativevote(AV) | Approval Voting\* | BC | MBC | Condorcet |
| A | Canada | 3 | - | - | 1= | 1 | 2 | 2 |
| B | France | 1= | 2 | 2 | 3 | 3 | 3 | 3 |
| C | Kenya | 4 | - | - | 5 | 6 | 6 | 6 |
| D | Russia | 5= | - | - | 1= | 4 | 4 | 4 |
| E | Taiwan | 1= | 1 | 1 | 4 | 2 | 1 | 1 |
| F | Turkey | 5= | - | - | 6 | 5 | 5 | 5 |

The MBC social ranking is the same as the Condorcet social ranking, so to imply that these two methodologies are both very accurate. It should also be noted that there is a substantial difference between the social ranking of the Borda Count (BC) and that of an MBC, so to suggest the importance of using the MBC cannot be over-emphasised.

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PS At least one person may have submitted a ballot, as it were, upside-down, giving a 6 to his/her favourite, a 5 to the 2nd preference, etc. But no-one admitted to so doing. That said, there is always a danger, in any voting system, that people will “get things mixed up” so to render some ballots invalid, and an unknown quantity of others inaccurate.

\* This analysis of approval voting assumes that all preferences cast can be counted as ‘approvals’.

**Abbreviations**

AV alternative vote

BC Borda count

MBC modified Borda count