

Quiz 2 - Solutions!

1. Eugene Levy (L), Robert Gronkoski (G), and Melissa McCarthy (M) are competing in “So you think you can dance”. The $N = 5$ judges’ votes are in:

3	2
M	G
G	L
L	M

- (a) Is there a majority candidate? (1 pt) Yes - M
- (b) Compute the Borda scores for each of the three candidates (1pt each):

$$\mathcal{B}(L) = 2 \times 2 + 3 \times 1 = 7$$

$$\mathcal{B}(G) = 2 \times 3 + 3 \times 2 = 12$$

$$\mathcal{B}(M) = 3 \times 3 + 2 \times 1 = 11$$

Who wins by Borda count? (1 pt) G

- (c) Who wins by pairwise comparison? (1 pt) M

2. Circle T if the claim is true, F if the claim is false (1 pt each):

- (a) Borda count is Condorcet fair. T F
- (b) Borda count satisfies the unanimity criterion in the example from Question 1. T F
- (c) The example in Question 1 shows that plurality is NOT Condorcet fair. T F
- (d) All majority fair winner selection methods satisfy the Condorcet criterion. T F

Justifications of True/False:

- (a) One possible counterexample in Question 1: M is a majority candidate, hence a Condorcet candidate, but M does not win by Borda count.
- (b) Borda count always satisfies the unanimity criterion. In this election, we see that G is voted unanimously above L , and L does not win by Borda count.
- (c) M is a Condorcet candidate and does win by plurality, so the example in Question 1 does not show that plurality fails the Condorcet criterion.
- (d) Plurality, runoff, and elimination are all majority fair, but they are NOT Condorcet fair.