

Problem 1. Consider the following profile for a 2-candidate election:

A	B	A	B	A
A	B	A	A	B
B	A	B	B	B

- (a) Give a tabulated profile corresponding to this profile.
- (b) What is the result under the simple majority method?
- (c) Suppose we use a weighted voting method where each voter in the first row gets weight 4, each voter in the second row gets weight 3, and each voter in the third row gets weight 1. What is the result?
- (d) Suppose we use a bloc voting method where each column is a bloc that gets one vote. What is the result?

Solution:

(a)

7	8
A	B

- (b) B wins under the simple majority method.
- (c) A gets $4 + 4 + 4 + 3 + 3 + 3 + 1 = 22$ votes, and B gets $4 + 4 + 3 + 3 + 1 + 1 + 1 + 1 = 18$ votes. So A wins.
- (d) A wins blocs 1 and 3, while B wins blocs 2, 4, and 5. So B wins.

Problem 2. Consider the following tabulated profile for a three-candidate election:

3	4	5	4	2
A	B	C	A	B
B	C	B	C	A
C	A	A	B	C

- (a) What is the result under the plurality method?
- (b) What is the result under the Borda count method?
- (c) What is the result under Hare's method?

Solution:

- (a) A gets 7 votes, B gets 6, and C gets 5, so A wins.
- (b) A gets $6 + 0 + 0 + 8 + 2 = 16$ votes. B gets $3 + 8 + 5 + 0 + 4 = 20$ votes. C gets $0 + 4 + 10 + 4 + 0 = 18$ votes. So B wins.
- (c) C has the fewest first-place votes, and so is eliminated. In the next round, A has $3 + 4 = 7$ first-place votes and B has $4 + 5 + 2 = 11$ first-place votes, so A is eliminated and B wins.