

Condorcet's Method

Compare everybody in pairs and find a candidate who would win all of their pairwise matchups. (the Condorcet winner)

Choose that one to win the election.

37-voter handout:

14	10	8	4	1
A	C	D	B	C
B	B	C	D	D
C	D	B	C	B
D	A	A	A	A.

B vs C: B: 18
C: 19

Pairwise:

A vs B: A: 14
B: 23

A vs C: A: 14
C: 23

A vs D: A: 14
D: 23

B vs D: B: 28
D: 9

C vs D: C: 25
D: 12

With 4 candidates, there's 6 possible pairings.

C wins all of their pairwise comparisons, so C wins with Condorcet's method.

<u>Ex</u>	12	8	7	2	
	A	B	C	B	29 votes.
	B	C	A	A	
	C	A	B	C	

A vs B: A: 19
B: 10

B vs C: B: 22
C: 7

A vs C: A: 14
C: 15

No candidate wins all pairwise comparisons, so

there is no winner with Condorcet method.

Condorcet's method doesn't always choose a winner, so it's not used in politics.

Another voting method:

The Borda Count

Based on rankings, candidates get points, add them all up to find the winner.

ranking like:

	points		
A	3	A	2
B	2	B	1
C	1	C	0
D	0		

last place gets 0, other spots accordingly.

with n candidates, 1st place gets $n-1$

			<u>pts</u>
1	1	1	
A	B	C	3
B	A	D	2
C	D	B	1
D	C	A	0

Add the points:

$$A: 3 + 2 + 0 = 5$$

$$B: 2 + 3 + 1 = 6 \leftarrow \text{B wins!}$$

$$C: 1 + 0 + 2 = 4$$

$$D: 0 + 1 + 2 = 3$$

3	2		
A	B	2	A: $3 \cdot 2 + 2 \cdot 0 = 6$
B	C	1	B: $3 \cdot 1 + 2 \cdot 2 = 7$
C	A	0	C: $3 \cdot 0 + 2 \cdot 1 = 2$

B wins!

BGN:

<u>2.9</u>	<u>2.9</u>	<u>.1</u>	
B	G	N	2
G	B	G	1
N	N	B	0

B: $2.9 \cdot 2 + 2.9 \cdot 1 + .1 \cdot 0 = 8.7$

G: $2.9 \cdot 1 + 2.9 \cdot 2 + .1 \cdot 1 = 8.8 \leftarrow G \text{ wins.}$

N: $2.9 \cdot 0 + 2.9 \cdot 0 + .1 \cdot 2 = 0.2$

<u>14</u>	<u>10</u>	<u>8</u>	<u>4</u>	<u>1</u>	
A	C	D	B	C	3
B	B	C	D	D	2
C	D	B	C	B	1
D	A	A	A	A.	0

A: $14 \cdot 3 + 10 \cdot 0 + 8 \cdot 0 + 4 \cdot 0 + 1 \cdot 0 = 42$

B: $14 \cdot 2 + 10 \cdot 2 + 8 \cdot 1 + 4 \cdot 3 + 1 \cdot 1 =$

$28 + 20 + 8 + 12 + 1 = 69 \leftarrow B!$

C: $14 \cdot 1 + 10 \cdot 3 + 8 \cdot 2 + 4 \cdot 1 + 1 \cdot 3 = 67$

D: $14 \cdot 0 + 10 \cdot 1 + 8 \cdot 3 + 4 \cdot 2 + 1 \cdot 2 = 44$

In this example,

Plurality: A

RCV: D

Borda: B

Condorcet: C

The system you use can make a big difference, and different reasonable systems can give different reasonable answers.

Best Movies with Condorcet & Borda