

Who's the Winner?

Let's say that five countries, France, Germany, Italy, Spain, and the United Kingdom are trying to vote on a president for the European Union. There are five choices, Audrey, Eileen, Ian, Otto, and Ursula. Your job is to decide which voting system we should use to decide who wins. Here are the five choices:

1) Every country gets two votes. The candidate with the most votes in that country gets the two votes.

2) (Winner-Take-All) Every country gets as many votes as it has citizens. The candidate with the most votes in that country gets this number of votes.

3) (Popular Vote) Every person gets one vote. You add the number of votes each candidate received in each country to come up with his or her total number of votes.

4) (5-4-3-2-1 System) In every country, the candidate with the most votes gets a score of 5. The candidate with the second most number of votes gets a score of 4. Continue until the fifth candidate gets a score of 1. Then add together the scores of all the candidates to see who wins.

5) In every country, the people vote and decide who they might support. Any candidate with over 15% of the vote will get some votes, proportional to how many total votes the country has. Then add up these totals over all the countries. For example, Candidates A, B, and C receive 40, 25, and 15 percent of the vote respectively in a country with 80 million people. Then Candidate A will win $(80 \text{ million}) \times 40 / (40 + 25 + 15) = 40 \text{ million votes}$.

Write down the numbers of the two systems that seem the most fair:

Now the countries are going to vote. Here are how many million people voted for each of the candidates:

	France 60 million	Germany 80 million	Italy 40 million	Spain 30 million	UK 50 million
Audrey	3	25	1	1	3
Eileen	30	23	5	4	6
Ian	12	13	11	2	20
Otto	10	12	10	11	19
Ursula	5	7	13	12	2

This is the table for System 5

	F	D	I	SP	UK
A	0	28	0	0	0
E	35	25	0	0	0
I	14	14	13	0	26
O	11	13	12	14	24
U	0	0	15	18	0

For each of your two systems, calculate who won.

System 1

System 2

Who should be the real winner?