

Math 1015: Homework #1

Question 1. I'm voting with my friends about the best local dog salon. Our choices are "Snip Doggy Dog" (SDD), "Waggies" (Wa), "Woof" (Wo), and "Ruff Cut" (RC). (These are all real names of dog salons in Fairfield county. Unfortunately Snip Doggy Dog has closed.) People's votes are like this:

Me	Friend 1	Friend 2	Friend 3	Friend 4	Friend 5	Friend 6	Friend 7
SDD	RC	Wa	RC	Wo	Wa	Wo	RC
Wo	Wo	SDD	SDD	SDD	SDD	Wa	Wo
Wa	Wa	Wo	Wa	RC	Wo	SDD	Wa
RC	SDD	RC	Wo	Wa	RC	RC	SDD

Please determine the results if we are using:

- a) Plurality
- b) Ranked Choice Voting

Question 2. In the 1980 US senate race in New York, the candidates were D'Amato (D), Holtzman (H), and Javits (J). Based on polling people's opinions between the three, the population's preferences were something like this:

22%	23%	15%	29%	7%	4%
D	D	H	H	J	J
H	J	D	J	H	D
J	H	J	D	D	H

Please determine the results if we are using:

- a) Plurality
- b) Ranked Choice Voting

Question 3. Please invent your own example where the plurality winner is different from the ranked choice winner. (You don't need to make up a cute story— just give me a table of the votes and show that the two winners are different.)

Question 4. The Condorcet paradox example we discussed in class was something like this:

10	10	10
A	B	C
B	C	A
C	A	B

The interesting thing about this example is that A is above B in 2/3 of the ballots, B is

above C in 2/3 of the ballots, and also C is above A in 2/3 of the ballots.

Please build a similar example using 4 candidates A,B,C,D where A is above B in 3/4 of the ballots, B is above C in 3/4 of the ballots, C is above D in 3/4 of the ballots, and D is above A in 3/4 of the ballots. (You need to modify the example above by introducing D's, perhaps changing the amount of columns.)