

Consider the following preference schedules for an election.



1. How many preference schedules are possible (if ties are not permitted)?

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$$

#1) 24

2. Who is the plurality winner?

What is the percentage of 1st place votes each received?

$$8 + 5 + 6 + 7 = 26$$

$$\frac{8}{26} = 30.8\%$$

#2) Droid 4; 30.8%

3. How many first place votes would be needed in this example for there to be a majority winner? more than 1/2 the votes

$$26/2 = 13$$

#3) 14 votes

If there is a majority winner who is it? none

#3) NONE

4. Who is the 'run off' winner? B/w Droid + Bold
8 5+6+7

#4) Bold; 18

5. Who is the 'sequential run off' winner?

#5) Galaxy



D(8) ~~B(7)~~ G(6) B(7)
D(8) G(11) B(7)
~~D(8)~~ G(18)

6. What is each candidates Borda count?

#6) Droid: 50
iP6: 83
Glx5: 69
Z30: 58
#6) iPhone

Who is the 'Borda Count' winner?

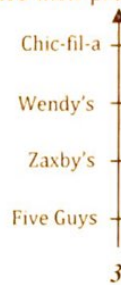
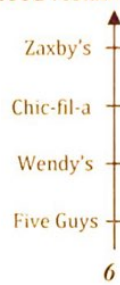
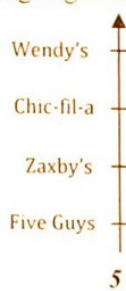
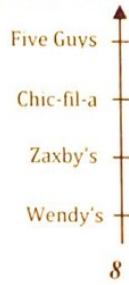
Demonstrate how this can be done with matrix multiplication

7. What is each candidates Condorcet winner?

#7) iPhone

⇒	Drd	iP6	G5	Z30
Drd	*	L	L	L
iP6	W	*	W	W
G5	W	L	*	W
Z30	W	L	L	*

Twenty-two Discrete Math students are arguing over which fast food restaurants and listed their preferences below.



total: 22

1. In your own words, give a description of the **plurality winner**

candidate w/ most 1st place votes

What percentage of 1st place votes does each of the following choices have?

Choice	Five Guys	Chic-fil-a	Zaxby's	Wendy's
Percentage of 1 st place votes	$8/22 = 36.4\%$	$3/22 = 13.6\%$	$6/22 = 27.3\%$	$5/22 = 22.7\%$

Who is the **plurality winner**?

2) Five Guys

2. a. What is the minimum number of first place votes needed in this example for there to be a **majority winner**?

#3a) 12

b. If there is a **majority winner** who is it?

3. In your own words, give a description of the **'run off' winner** :

#3b) NO majority winner

Who is the **'run off' winner**?

#4) Zaxby's

4. In your own words, give a description of the **'sequential run off' winner** :

Who is the **'sequential run off' winner**?

5) Wendy's

5. In your own words, give a description of the **'Borda Count' winner** (on a separate page show how this might be done using Matrices):

a. Give the Borda Count for each letter:

#6a) 5G: 46 C: 69 Zx: 59 W: 49

b. Who is the **'Borda Count' winner**?

#6b) Chick-fil-A

6. Determine the Condorcet Winner.

→	5G	C	Zx	W
5G	*	L	L	L
C	W	*	W	W
Zx			*	
W				*