

Math 1015

Prof. Staecker

OH: TF 10:30 - 11, 12 - 12:30

W 9 - 10, 12 - 12:30

Interesting ideas.

Not necessarily useful

Not much numbers,
calculating
formulas
geometry

Topics are "simple", but more complex
than they seem.

Voting not so simple as it seems.

Idea: A (big) group of people disagree,
but must make a choice.

- Ask everybody's opinion
- Combine these into a single
"will of the people"

Not obviously a good idea.

Example vote:

• Mango

• Rice

• Cheese

• Pineapple

• Watermelon

• grapes

• Maple syrup

<u>2</u>	Cheese	1, 2, 3, 4,
<u>1</u>	Pineapple	1 is best
<u>3</u>	Watermelon	
<u>4</u>	Maple syrup	

Please hassle me.

<u>2</u>	Cheese	How to decide the winner?
<u>1</u>	Pineapple	
<u>3</u>	Watermelon	
<u>4</u>	Maple syrup	

Could count up greatest # of 1's.

Could average rankings for each option, choose best

Could assign points

Several non-obvious ways we could calculate the result.

What are some different ways to choose the winner, and which way is the best?

Turns out there's no "best" way.

Churchill: Democracy is the worst form of government except for all the others

Example voters are choosing between options A, B, C, D, etc.

Voters rank their choices,

like one vote may say ACB

"A is best, then C, then B is worst"

Say we have A, B, C options

25 voters say ABC

37 BAC

38 ~ ~ ~ ~ ~ ACB

Write it in a chart:

$\frac{25}{A}$	$\frac{37}{B}$	$\frac{38}{A}$
B	A	C
C	C	B

Who should win?

Seems like A is pretty strong,
nobody wants C to win.

New example:

$\frac{3}{A}$	$\frac{3}{B}$	$\frac{3}{C}$
B	C	A
C	A	B

looks like a 3-way tie.

If I consider only A vs B: $\frac{3}{A}$ $\frac{3}{B}$ $\frac{3}{A}$
B A B

The people like A more than B.

Consider only B vs C: $\frac{3}{B}$ $\frac{3}{B}$ $\frac{3}{C}$
C C B

They like B more than C.

Consider only A vs C: $\frac{3}{A}$ $\frac{3}{C}$ $\frac{3}{C}$
C A A

like C more than A.