Economics 220, Jan 2022 **Your Name:** Dhyey Dharmendrakumar Mavani
Homework 6

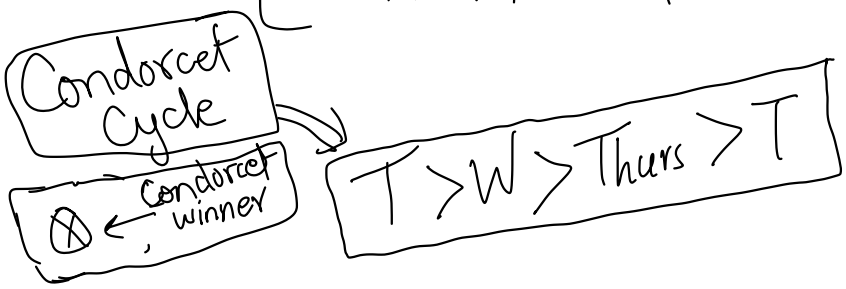
A professor allows the seven students in her class to choose the day of the week for their midterm. Their preferences are as follows:

Aleah	Bobby	Cynthia	Darius	Ella	Faye	Gabby
M	M	M	W	W	T	F
T	Thurs	Thurs	T	Thurs	W	W
W	T	T	Thurs	T	Thurs	Thurs
Thurs	F	F	F	M	M	T
F	W	W	M	F	F	M

Does this social choice situation have a Condorcet winner? If so, what is it? If not, explain why not.

M > F, T > F, W > F, Thurs > F | T > M, W > M, Thurs > M | T > W, W > Thurs, Thurs > T

No, there is no condorcet winner because there is a condorcet cycle in the pairwise comparisions of preferences over the weekdays.



What option will be chosen if they use….

- Plurality rule?

Plurality voting	Aleah	Bobby	Cynthia	Darius	Ella	Faye	Gabby
1	M	M	M	W	W	T	F
0	T	Thurs	Thurs	T	Thurs	W	W
0	W	T	T	Thurs	T	Thurs	Thurs
0	Thurs	F	F	F	M	M	T
0	F	W	W	M	F	F	M

M : 3
W : 2
T : 1
F : 1

⇒ Thus, under Plurality rule, [M] will be chosen.

- A Borda Count?

	Amy	Bill	Cynthia	Darius	Ella	Fynn	Gabby
4	M	M	M	W	W	T	F
3	T	Thurs	Thurs	T	Thurs	W	W
2	W	T	T	Thurs	T	Thurs	Thurs
1	Thurs	F	F	F	M	M	T
0	F	W	W	M	F	F	M

Points:

M ___14___ = 4(3) + 3(0) + 2(0) + 1(2) + 0(2)

T ___17___ = 4(1) + 3(2) + 2(3) + 1(1) + 0(0)

W ___16___ = 4(2) + 3(2) + 2(1) + 1(0) + 0(2) Winner: ___T___ is Borda Winner

Th ___16___ = 4(0) + 3(3) + 2(3) + 1(1) + 0(0)

F ___7___ = 4(1) + 3(0) + 2(0) + 1(3) + 0(3)

Assuming all other students will vote honestly, would any student have an incentive to misrepresent their preferences to change the outcome of the Borda count? If so, give an example.

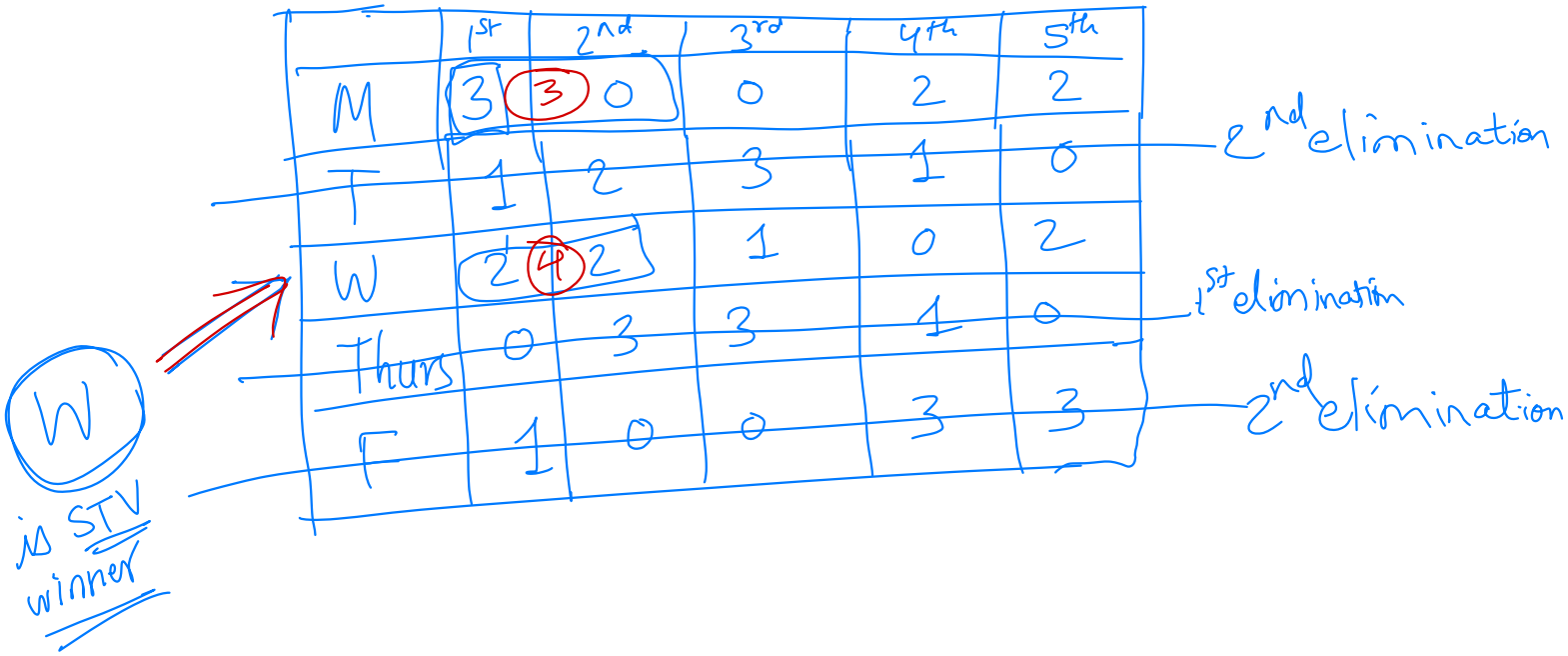
Ella likes W more than T, so she can lie in the following two steps for example.

She can first switch F and T, then she can switch F and Thurs, which leads the new Borda counts to be:

M	14
T	15
W	16
Thurs	15
F	10

, which makes W the Borda winner by serving the Ella's purpose of lying.

- A Single Transferrable Vote/runoff system? (every submits a ranked list; sequentially eliminate the options with the fewest first-preference votes and redistribute those votes to their second choices) (assume everyone votes honestly)



- Sequential Pairwise voting that begins by voting between Monday and Tuesday, and then compares the winner with Wednesday (the next day of the week in turn), and so on? (assuming everyone votes honestly).

M > T : 3
T > M : 4
⇒ T > M

T > W : 4
W > T : 3
⇒ T > W

T > Thurs : 3
Thurs > T : 4
⇒ Thurs > T

Thurs > F 6
F > Thurs 1
⇒ Thurs > F

⇒ Thursday is Seq. Pair-Wise winner

Consider Cynthia's preferences over the preference aggregation ('voting') method used. Please rank Cynthia's preferences over Plurality, Borda Count, Sequential Pairwise voting, and STV.

M > Thurs > T > F > W : Cynthia's Preferences

⇓ Based on the calculated answers of previous parts.

Plurality > Sequential Pairwise Voting > Borda Count > STV

Ella wants the exam to be on Wednesday. Suppose she will get to set the agenda for a sequential pairwise-voting process in the students vote (honestly) between two days; then for the winner against another specified day; and so on until all options have been exhausted. Can Ella design an agenda to get her preferred outcome? Explain.

M > F		
T > F	T > M	T > W
W > F	W > M	W > Thurs
Thurs > F	Thurs > M	Thurs > T

⇒ head-to-head comparisions from part (i)

Ella's First move: Thurs > T

(Thurs) Winner plays this: W > Thurs

(W) Winner plays this: W > M

(W) Winner plays this: W > F

ALL OPTIONS EXHAUSTED

Ella can design an agenda by setting the first comparison between Thurs & T

⇓

Thus Wednesday will be the outcome in sequential pairwise voting process