CPT302 Week 10 In-Class Exercises

Name and Surname:_____

Student ID:_____

Supplementary notes

A majority candidate: A candidate with more than half of the first place votes is a majority candidate.
Plurality-With-Elimination Method: This method is a preferential voting method and is a variation of the Plurality Method. Plurality with Elimination is carried out in rounds. After each round of voting the candidate (or alternative) with the fewest first place votes is eliminated and a new round of voting is done with the remaining candidates. When only two candidates remain in a round, the candidate with the most votes wins the election.
The Method of Pairwise Comparisons: Each candidate (or alternative) is matched head-to-head (one-on-one) with each of the other candidates. Each candidate (alternative) gets 1 point for a one-on-one win and a half a point for a tie. The candidate (alternative) with the most total points is the winner.

Q1. How do you decide the winner of an election using the Plurality Method?
Ans:
The candidate with the most first place votes wins.

Q2. How do you decide the winner of an election using the Borda Count Method?
Ans:
1 point is awarded for last place, 2 points for second to last place, etc. You can then find a point total for every candidate and the candidate with the highest point total wins.

Q3. How do you decide the winner of an election using the Method of Pairwise Comparisons?
Ans:
Every candidate goes head to head. The candidate with the most victories wins.

Q4. Does every election have a majority candidate?
Ans:
Not every election has one.

Q5. What is a Condorcet candidate? Does every election have a Condorcet candidate?
Ans:
A candidate who wins against every other candidate in a pairwise comparison (head to head match up) is a Condorcet candidate. Not every election has one.

Q6. For this question, use the following preference schedule:

Number of Voters	14	10	8	4	1
1st choice	A	C	D	B	C
2nd choice	B	B	C	D	D
3rd choice	C	D	B	C	B
4th choice	D	A	A	A	A

(a). Find the winner of the election using the Plurality Method.
Ans:

	A	*B*	*C*	*D*
Number of first place votes	*14*	*4*	*11*	*8*

Since A has the most first place votes, then A wins.

(b). Find the winner of the election using the Borda Count Method.
Ans:

Candidate	*Points*
A	*14(4) + 10(1)+8(1) + 4(1) +1(1) = 79*
B	*14(3) + 10(3)+8(2) + 4(4) +1(2) = 106*
C	*14(2) + 10(4)+8(3) + 4(3) +1(4) = 104*
D	*14(1) + 10(2)+8(4) + 4(3) +1(3) = 81*

Since B has the most points, then B wins.

(c). Find the winner of the election using the Method of Pairwise Comparisons. Is there any Condorcet winner in the election?
Ans:

A	B
14	23

A	C
14	23

A	D
14	23

B	C
18	19

B	D
28	9

C	D
25	12

Candidate C wins the most pairwise comparisons so he wins. (In fact, he is a Condorcet candidate.)