Homework Assignment #4
Due March 31, 2016

1. These questions are related to the allocation of seats in the National Assembly in South Africa.

    (a) What is an advantage of allocating seats to the provinces based on the number of registered voters rather than based on the population? What is a disadvantage?

    (b) When allocating the 400 seats to the parties, what is the reason for allocating a maximum of five seats based on the largest remainder and the rest of the seats based on the number of votes per seat?

    (c) What are the advantages of allocating some seats at the provincial level and the remainder from national lists?

2. Consider the profile

$$
\begin{array}{llll}
15 & A > B > C & 12 & C > B > A \\
5 & A > C > B & 7 & B > C > A \\
15 & C > A > B & 11 & B > A > C
\end{array}
$$

    (a) Calculate the rankings using plurality, plurality with runoff, antiplurality, and the Borda Count.

    (b) Calculate the pairwise election outcomes, and determine the Condorcet winner.

    (c) Sketch the procedure line for this profile.

    (d) What outcomes, including ties, are possible by using a weighted method for this profile?

    (e) For each outcome you specified in part (d), give a weighted method that determines the outcome.

3. Create examples of profiles with three candidates that have the following properties or explain why no such profile exists.

    (a) All weighted voting methods give an outcome of $B > A > C$.

    (b) B is the Condorcet winner, the plurality outcome is $A > B > C$, the Borda outcome is $C > A > B$, and the antiplurality outcome is $B > C > A$.