

## Homework 5: Game Theory (2019)

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1. Suppose we have 4 political parties A, B, C, and D with votes 100, 80, 70, and 50 respectively, to which we want to assign a non-negative integer number of seats in a "parliament" (legislature) which has size  $h$  (for house size) where  $h$  equals 13 seats. It is not insisted upon that a party get at least one seat. How many seats should be given to each party if:

a. Webster's Method with the calculations done using both the divisor/rounding rule approach and the "table method" associated with Webster's method.

b. D'Hondt's Method (in essence the European version of Jefferson's method) with the calculations done using both the divisor/rounding rule approach and the "table method" associated with D'Hondt's method.

c. Adams's Method with the calculations done using both the divisor/rounding rule approach and the "table method" associated with Adams's Method.

2. Repeat 1. using only the table method approach with  $h = 14$ .

3. Do the results of 1. and 2. show an occurrence of the Alabama Paradox? (This refers to getting fewer seats with a larger house size.)

4. Do the results in 1. or 2. show a violation of "quota?" (Quota means that a party would get its ideal quota rounded up or down to the nearest integer.)