Some Examples Using Hamilton's Method of Apportionment

Consider a (very) small nation consisting of four states with the following populations in 2010:

State	Population
A	13,000
B	15,000
C	4,000
D	6,000
TOTAL	**38,000**

1. Use Hamilton's method to calculate the apportionment with a House size of 54.

   Now use Hamilton's method with a House size of 55.

   Compare your results.

2. Use Hamilton's method to calculate the apportionment with a House size of 43.

   Now suppose when the next census is completed in 2020 that the states have grown at the following rates:

   A by 11% B by 15% C by 10% D by 20%

   Recalculate the apportionment using Hamilton's method. Compare your results.

   If B had grown at 13%, how would the result change?

3. Consider once again the calculations from #1 for an apportionment for a House of size 54 for the 2010 census using Hamilton's method. Notice that each representative represents $\frac{38{,}000}{54} \approx 704$ citizens, on average.

   Now suppose that state E is joining the nation with a population of 7,450. Based on the average representation, it seems that E should get 11 seats. Calculate the apportionment using Hamilton's method with state E added and a House size of $54 + 11 = 65$.

   Compare your results to the House size of 54.