

# Apportionment Examples: Different Methods Can Assign Different Numbers of Seats for the Same Data (2018)

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State	Population	Quota	Jefferson	Adams	Webster	Hill	Hamilton
State A	1,908,578	40.705	42	38	41	40	41
State B	1,366,072	29.135	30	28	29	29	29
State C	651,832	13.902	14	14	14	14	14
State D	250,657	5.346	5	6	5	5	5
State E	163,904	3.496	3	4	4	4	3
State F	157,147	3.352	3	4	3	3	3
State G	120,419	2.568	2	3	3	3	3
State H	70,173	1.497	1	2	1	2	2
Total	4,688,782	100	100	100	100	100	100
Divisor <sup>2</sup>			44,800	49,000	46,800	47,300	--

Table 1

Party $i$	$v_i$	$q_i$	Jefferson	Webster	Hill	Dean	Adams
$A$	9,061	9.061	10	9	9	9	9
$B$	7,179	7.179	7	8	7	7	7
$C$	5,259	5.259	5	5	6	5	5
$D$	3,319	3.319	3	3	3	4	3
$E$	1,182	1.182	1	1	1	1	2
Total	26,000	26	26	26	26	26	26

Table 2

Party $i$	$v_i$	$q_i$	Hm	L	J	W	H	D	A	Q	M
$A$	9,061	9.061	9	9	10	9	9	9	9	10	9
$B$	7,179	7.179	7	7	7	8	7	7	7	7	7
$C$	5,259	5.259	5	5	5	5	6	5	5	5	5
$D$	3,319	3.319	4	3	3	3	3	4	3	3	3
$E$	1,182	1.182	1	2	1	1	1	1	2	1	2
Total	26,000	26	26	26	26	26	26	26	26	26	26

Legend: Hm: Hamilton, L: Lowndes, J: Jefferson, W: Webster, H: Hill, D: Dean, A: Adams, Q: Quota Method, and M: Minimax Apportionment.

Table 3 (Same Data as Table 2 but more different methods indicated.

The L, in Table 3 refers to Lowndes Method, who proposed it in 1822, as a variation of Hamilton's Method. Lowndes was a member of the House of Representatives from South Carolina at the time.

Lowndes Method: If  $h$  is the house size determine the exact quota for

each state using each states' population. Each state would be initially assigned the integer part of its exact quota. Now, instead of ordering the fractional parts in order of size (as in Hamilton's Method), one divides the exact quota by the integer part of this exact quota. The remaining seats are given away in the order of these numbers, which is typically not the same as the order of the fractional parts. (This method adjusts the fractional parts for the size of the states rather than just looking at the size of the parts themselves.)

These examples are due to Mark Beumer.

Reference:

Beumer, M., Masters Thesis, University of Amsterdam, 2010.