

## Comparison Example for Table Method: Jefferson and D'Hondt (2020)

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Below one can see the way D'hondt and Jefferson, while very much similar in spirit, distribute seats for some time in different orders to claimants as the House size increases one seat at a time, starting with  $h = 1$ . Remember, this is because Jefferson gives each state one seat at the start of the process while D'Hondt does not. The order of seats is shown (on the right on lines of the tables) and when multiple numbers appear, it indicates a tie for the seats at these sizes for  $h$ . There is a blank table at the start, which is a template for Jefferson/D'Hondt, with 7 rows.

Note that for each value of  $h$  shown in the table, one can verify using round down as the rounding rule divisor method approach to finding the apportionment for the given value of  $h$ . However, for divisor methods where we see ties in the table, it is "harder" to "see" using the trial and error adjusted quota rounding rule approach. For these "shared" entries (several numbers) some tie-breaking mechanism is needed for some values of  $h$ . Note these ties occur even though the claimants don't have tied claim values. By the time  $h = 17$  the tables are such that future seats are given out in the same way by both D'Hondt and Jefferson.

	A	B	C	D
<b>Original data</b>				
1. Divide by 1				
2. Divide by 2				
3. Divide by 3				
4. Divide by 4				
5. Divide by 5				
6. Divide by 6				
7. Divide by 7				

# Jefferson:

	A	B	C	D
<b>Original data</b>	400	300	240	60
1. Divide by 1	400    1-4	300    1-4	240    1-4	60    1-4
2. Divide by 2	200    5	150    6	120    8	30
3. Divide by 3	133.3    7	100    9-10	80    11-12	20
4. Divide by 4	100    9-10	75    13	60    15-16	15
5. Divide by 5	80    11-12	60    15-16	48	12
6. Divide by 6	66.7    14	50	40	10
7. Divide by 7	57.1    17	42.9	34.3	8.6

For  $h > 17$  add more lines!! Extend table to divide by 8.

# D'Hondt:

	A	B	C	D
<b>Original data</b>	400	300	240	60
1. Divide by 1	400    1	300    2	240    3	60    14-16
2. Divide by 2	200    4	150    5	120    7	30
3. Divide by 3	133.3    6	100    8-9	80    10-11	20
4. Divide by 4	100    8-9	75    12	60    14-16	15
5. Divide by 5	80    10-11	60    14-16	48	12
6. Divide by 6	66.7    13	50	40	10
7. Divide by 7	57.1    17	42.9	34.3	8.6

Starting with seat 17 Jefferson and D'Hondt distribute seats for values of h larger than 17 in the same way. To distribute another seat add a line to the table first!

Note that if  $h = 17$ , how would the divisor version of the algorithm work?  $1000/17$  would mean that each state would be entitled to 1 seat for 58.82. Thus the exact shares would be 6.8 for A, 5.1 for B, 4.1 for C and 1.0 for D. Rounding down we give away 1 seat too few. Using 57 as an adjusted value for people per representative we would get: 7.01 for A, 5.3 for B, 4.2 for C and 1.05 for D. Rounding down we give away 7 to A, 5 to B, 4 to C and 1 to D. This adds to 17 and you can check this is the same answer that the table method gave us!