Voting System

To be elected as a senate/senator a candidate needs to gain a quota of the formal votes.

$$quota = \left\lfloor \frac{\text{number of formal ballot papers}}{\text{number of senators} + 1} \right\rfloor + 1$$

floor

positions yet to be filled.

Case Scenario:

If there exists 6 candidates & 3 senators to be elected & 100 ballot papers then,

$$quota = \left\lfloor \frac{100}{3 + 1} \right\rfloor + 1$$

$$= \left\lfloor \frac{100}{4} \right\rfloor + 1$$

$$= 25 + 1$$

$$\therefore = 26$$

If one candidate ➔candidate A achieves 30 votes in preference 1, then they get elected as they achieve more than the quota minimum.

Ballot paper (of 1 person)

Candidates:

A	B	C	D
1	2	3	4

Current Total ⟹ 1st preference votes

30 votes in total   30 votes in total   20 votes in total   10 votes in total

BELOW THE LINE

$$surplus = (total \ 1st \ preference - quota)$$

$$transfer\_value = \left(\frac{surplus}{\substack{number \ of \\ 1st \ preferences}} \right)$$

For the ~~pe~~ previous candidate → candidate A, with 30 votes

$$surplus = 30 - 26 = 4$$

$$transfer\_value = \left(\frac{4}{30} \right) \cong 0.1\overline{3}$$

Their 2nd preference candidate B ~~will~~ will receive the overflow of votes. However ~~candidate~~ ~~candidate~~ candidate B has achieved 30 votes so it is actually candidate C who has only 20 votes in total for their 1st preference that gets the overflow of votes.

~~Current~~ Previous 1st Preference votes :

	A	B	C	D
	30	30	20	10

Current 1st Preference votes :

	A	B	C	D
	30	30.1$\overline{3}$	20	10

Now we calculate candidate B's overflow

for the ballot paper.

surplus $= 30.1\overline{3} - 26 = 4.1\overline{3}$

transfer value $= \dfrac{4.1\overline{3}}{30.1\overline{3}} \approx 0.1372$

Now candidate C's 1st preference value is 20.1372
so from 1 ballot paper, we get:

Results ~~Previous~~ :

A	B	C	D
30	30.13	20.1372	10

For above the line, parties will be
counted like candidates below the line.
Same thing different label.

For parties :

A	B	C	D

Above the line

| | 1 | 2 | 3 | 4 |

candidates :

1	4	6	11
2	5	7	
3		8	
		9	
		10	

The party preferences flow into below the line
candidates & fill up like above.

Another party example:

	A	B	C	D	....
	[4] Party A	[2] Party B	[3] Party C	[1] Party D	

ABOVE THE LINE
─────────────────
BELOW THE LINE

A	B	C	D
[9] name	[3] name	[5] name	[1] name
[10] name	[4] name	[6] name	[2] name
[11] name		[7] name	
		[8] name	