Calcul01.pdf
(Proportional Completion)

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Markus Schulze
Markus.Schulze@Alumni.TU-Berlin.de

Abstract. In this paper, we illustrate the concept of “proportional completion”.

Introduction

We use instance A53 with $N = 460$ voters, $C = 10$ candidates, and $M = 4$ seats to illustrate the concept of “proportional completion”. A is the set of candidates. V is the set of voters. To be more concrete, we are looking for that situation where the candidates $\{a,c,d,i\}$ are running a vote management strategy against candidate h. In file *a53_stv.dat*, we can see that the strength of this vote management is:

$$\mathrm{r}\,(\,V\,\boxed{(h,\{a,c,d,i\})}\,) = 100.463016$$

This entry can be found here:

69	A	C	D	H	I	66.115932	102.894737	90.000000	100.463016	100.526316

In section 5.3 (“Proportional Completion”) of the paper “Free Riding and Vote Management under Proportional Representation by the Single Transferable Vote”, *proportional completion* is defined as follows:

> Suppose there is a voter $w \in V$ and a set of candidates $f_1,\dots,f_n \in A$ with
>
> (a) $n > 1$.
> (b) $\forall f_i,f_j \in \{f_1,\dots,f_n\} : f_i \approx_w f_j$.
> (c) $\forall f_i \in \{f_1,\dots,f_n\}\ \forall e \in A \setminus \{f_1,\dots,f_n\} : f_i \not\approx_w e$.
>
> $v \in V$ satisfies *conditionY* if and only if $\exists f_i,f_j \in \{f_1,\dots,f_n\} : f_i \not\approx_v f_j$.
> X is the sum of the weights of the voters with *conditionY*.
>
> Case 1: X > 0.
>
> For each voter $v \in V$ with *conditionY*:
>
> Voter u is added to V with:
>
> (a) $\rho(u) := \rho(v) \cdot \rho(w) / X$.
> (b) $\forall g,h \in A \setminus \{f_1,\dots,f_n\} : g \succ_w h \Leftrightarrow g \succ_u h$.
> (c) $\forall f_i \in \{f_1,\dots,f_n\}\ \forall g \in A \setminus \{f_1,\dots,f_n\} : g \succ_w f_i \Leftrightarrow g \succ_u f_i$.
> (d) $\forall f_i \in \{f_1,\dots,f_n\}\ \forall h \in A \setminus \{f_1,\dots,f_n\} : f_i \succ_w h \Leftrightarrow f_i \succ_u h$.
> (e) $\forall f_i,f_j \in \{f_1,\dots,f_n\} : f_i \succ_v f_j \Leftrightarrow f_i \succ_u f_j$.

Case 2: $X = 0$.

For each of the n! possible permutations $\{\sigma(1),...,\sigma(n)\}$ of $\{1,...,n\}$:

Voter u is added to V with:

(a) $\rho(u) := \rho(w) / (n!)$.
(b) $\forall\, g,h \in A \setminus \{f_1,...,f_n\}: g \succ_w h \Leftrightarrow g \succ_u h$.
(c) $\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, g \in A \setminus \{f_1,...,f_n\}: g \succ_w f_i \Leftrightarrow g \succ_u f_i$.
(d) $\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, h \in A \setminus \{f_1,...,f_n\}: f_i \succ_w h \Leftrightarrow f_i \succ_u h$.
(e) $\forall\, f_i,f_j \in \{f_1,...,f_n\}: \sigma(i) > \sigma(j) \Leftrightarrow f_i \succ_u f_j$.

After all these voters u have been added to V, the original voter w is removed from V.

Thus, each stage of the proportional completion procedure consists of four parts:

In the first part, we choose a voter $w \in V$ who is indifferent between some candidates. Suppose $\{f_1,...,f_n\} \subseteq A$ with $n > 1$ is a set of candidates such that ...

... voter $w \in V$ is indifferent between all the candidates of this set (i.e. $\forall\, f_i,f_j \in \{f_1,...,f_n\}: f_i \approx_w f_j$) and

... there is no candidate $e \in A \setminus \{f_1,...,f_n\}$ such that voter $w \in V$ is also indifferent between all the candidates of the set $B := (\{f_1,...,f_n\} \cup \{e\})$ (i.e. $\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, e \in A \setminus \{f_1,...,f_n\}$: $f_i \not\approx_w e$).

In the second part, we investigate how those voters who are not indifferent between all the candidates of the set $\{f_1,...,f_n\}$ (i.e. those voters $v \in V$ with $f_i \not\approx_v f_j$ for at least one pair of candidates $f_i,f_j \in \{f_1,...,f_n\}$) rank the candidates of the set $\{f_1,...,f_n\}$. Suppose X is the sum of the weights of those voters who are not indifferent between all the candidates of the set $\{f_1,...,f_n\}$.

In the third part, we have to distinguish two cases: $X > 0$ and $X = 0$.

If $X > 0$, then, for each voter $v \in V$ who is not indifferent between all the candidates of the set $\{f_1,...,f_n\}$, we add a voter u who ...

... has the weight $\rho(u) := \rho(v) \cdot \rho(w) / X$,

... ranks the candidates of the set $\{f_1,...,f_n\}$ in the same manner as voter v does (i.e. $\forall\, f_i,f_j \in \{f_1,...,f_n\}: f_i \succ_v f_j \Leftrightarrow f_i \succ_u f_j$), and

... ranks the other candidates in the same manner as voter w does (i.e.:
$\forall\, g,h \in A \setminus \{f_1,...,f_n\}: g \succ_w h \Leftrightarrow g \succ_u h$.
$\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, g \in A \setminus \{f_1,...,f_n\}: g \succ_w f_i \Leftrightarrow g \succ_u f_i$.
$\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, h \in A \setminus \{f_1,...,f_n\}: f_i \succ_w h \Leftrightarrow f_i \succ_u h$.).

If X = 0, then, for each of the n! possible permutations of the candidates $\{f_1,...,f_n\}$, we add a voter *u* who ...

... has the weight $\rho(u) := \rho(w) / (n!)$,

... ranks the candidates of the set $\{f_1,...,f_n\}$ in this permutation, and

... ranks the other candidates in the same manner as voter *w* does (i.e.:
$\forall\, g,h \in A \setminus \{f_1,...,f_n\}: g \succ_w h \Leftrightarrow g \succ_u h.$
$\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, g \in A \setminus \{f_1,...,f_n\}: g \succ_w f_i \Leftrightarrow g \succ_u f_i.$
$\forall\, f_i \in \{f_1,...,f_n\}\ \forall\, h \in A \setminus \{f_1,...,f_n\}: f_i \succ_w h \Leftrightarrow f_i \succ_u h.$).

In the fourth part, the original voter *w* is removed from *V*.

We apply proportional completion for every vote management separately. The strength of the vote management of the candidates $\{a,c,d,i\}$ against candidate *h* depends only on whether the individual voter strictly prefers the different candidates of the set $\{a,c,d,i\}$ to candidate *h* or strictly prefers candidate *h* to the different candidates of the set $\{a,c,d,i\}$ or is indifferent between the different candidates of the set $\{a,c,d,i\}$ and candidate *h*. Therefore, the fact, that we apply proportional completion for every vote management separately, means that only 3^*C* = 81 possible voting patterns need to be considered. The following table lists these 81 possible voting patterns, where "1" means that a voter with this voting pattern strictly prefers this candidate to candidate *h*, a "2" means that this voter is indifferent between this candidate and candidate *h*, and a "3" means that this voter strictly prefers candidate *h* to this candidate.

voting pattern	*a*	*c*	*d*	*i*
#1	1	1	1	1
#2	1	1	1	2
#3	1	1	1	3
#4	1	1	2	1
#5	1	1	2	2
#6	1	1	2	3
#7	1	1	3	1
#8	1	1	3	2
#9	1	1	3	3
#10	1	2	1	1
#11	1	2	1	2
#12	1	2	1	3
#13	1	2	2	1
#14	1	2	2	2
#15	1	2	2	3
#16	1	2	3	1
#17	1	2	3	2
#18	1	2	3	3
#19	1	3	1	1
#20	1	3	1	2
#21	1	3	1	3
#22	1	3	2	1
#23	1	3	2	2
#24	1	3	2	3
#25	1	3	3	1
#26	1	3	3	2
#27	1	3	3	3
#28	2	1	1	1
#29	2	1	1	2
#30	2	1	1	3
#31	2	1	2	1
#32	2	1	2	2
#33	2	1	2	3
#34	2	1	3	1
#35	2	1	3	2
#36	2	1	3	3
#37	2	2	1	1
#38	2	2	1	2
#39	2	2	1	3
#40	2	2	2	1

voting pattern	*a*	*c*	*d*	*i*
#41	2	2	2	2
#42	2	2	2	3
#43	2	2	3	1
#44	2	2	3	2
#45	2	2	3	3
#46	2	3	1	1
#47	2	3	1	2
#48	2	3	1	3
#49	2	3	2	1
#50	2	3	2	2
#51	2	3	2	3
#52	2	3	3	1
#53	2	3	3	2
#54	2	3	3	3
#55	3	1	1	1
#56	3	1	1	2
#57	3	1	1	3
#58	3	1	2	1
#59	3	1	2	2
#60	3	1	2	3
#61	3	1	3	1
#62	3	1	3	2
#63	3	1	3	3
#64	3	2	1	1
#65	3	2	1	2
#66	3	2	1	3
#67	3	2	2	1
#68	3	2	2	2
#69	3	2	2	3
#70	3	2	3	1
#71	3	2	3	2
#72	3	2	3	3
#73	3	3	1	1
#74	3	3	1	2
#75	3	3	1	3
#76	3	3	2	1
#77	3	3	2	2
#78	3	3	2	3
#79	3	3	3	1
#80	3	3	3	2
#81	3	3	3	3

Table 1: The 81 possible voting patterns

w_y^x is the weight of the voters with voting pattern x at stage y.

$W_y(\Omega)$ is the sum of the weights of those voters at stage y who are not indifferent between all the candidates of the set Ω.

$\mathfrak{N}(x)$ is the number of 2's in voting pattern x. In other words: $\mathfrak{N}(x)$ is the number of those candidates of the set $\{a,c,d,i\}$ such that a voter with voting pattern x is indifferent between candidate h and these candidates.

At each stage of the proportional completion procedure, proportional completion is applied to a voting pattern x with maximum $\mathfrak{N}(x)$. In other words: First, we apply proportional completion to the voting pattern x with $\mathfrak{N}(x) = 4$. Then we apply proportional completion to the voting patterns x with $\mathfrak{N}(x) = 3$. Then we apply proportional completion to the voting patterns x with $\mathfrak{N}(x) = 2$. Then we apply proportional completion to the voting patterns x with $\mathfrak{N}(x) = 1$.

When proportional completion is applied to a voting pattern x with $\mathfrak{N}(x) = m$, then this voting pattern is always replaced by voting patterns $z(1)$, $z(2)$, $z(3)$, etc. with $\mathfrak{N}(z(1)) < m$, $\mathfrak{N}(z(2)) < m$, $\mathfrak{N}(z(3)) < m$, etc.. Therefore, when we apply proportional completion each time to a voting pattern x with maximum $\mathfrak{N}(x)$, then it is guaranteed that those voting patterns, to which proportional completion has already been applied at earlier stages of the proportional completion procedure, cannot reappear at later stages.

Stage 1:

For every possible voting pattern, the following table lists how many voters are using this voting pattern.

voting pattern		a	c	d	i
#1	w_1^1 = 46.000000	1	1	1	1
#2	w_1^2 = 15.000000	1	1	1	2
#3	w_1^3 = 24.000000	1	1	1	3
#4	w_1^4 = 8.000000	1	1	2	1
#5	w_1^5 = 10.000000	1	1	2	2
#7	w_1^7 = 10.000000	1	1	3	1
#9	w_1^9 = 19.000000	1	1	3	3
#10	w_1^{10} = 8.000000	1	2	1	1
#11	w_1^{11} = 29.000000	1	2	1	2
#13	w_1^{13} = 10.000000	1	2	2	1
#14	w_1^{14} = 26.000000	1	2	2	2
#19	w_1^{19} = 10.000000	1	3	1	1
#21	w_1^{21} = 15.000000	1	3	1	3
#22	w_1^{22} = 1.000000	1	3	2	1
#25	w_1^{25} = 9.000000	1	3	3	1
#27	w_1^{27} = 41.000000	1	3	3	3
#28	w_1^{28} = 3.000000	2	1	1	1
#29	w_1^{29} = 5.000000	2	1	1	2
#31	w_1^{31} = 5.000000	2	1	2	1
#32	w_1^{32} = 10.000000	2	1	2	2
#37	w_1^{37} = 7.000000	2	2	1	1
#38	w_1^{38} = 22.000000	2	2	1	2
#40	w_1^{40} = 14.000000	2	2	2	1
#41	w_1^{41} = 23.000000	2	2	2	2
#54	w_1^{54} = 1.000000	2	3	3	3
#55	w_1^{55} = 1.000000	3	1	1	1
#57	w_1^{57} = 3.000000	3	1	1	3
#61	w_1^{61} = 4.000000	3	1	3	1
#63	w_1^{63} = 5.000000	3	1	3	3
#73	w_1^{73} = 4.000000	3	3	1	1
#75	w_1^{75} = 11.000000	3	3	1	3
#79	w_1^{79} = 6.000000	3	3	3	1
#81	w_1^{81} = 55.000000	3	3	3	3
	460.000000				

Stage 2:

Proportional completion is applied to voting pattern #41 with $\mathfrak{N}(41) = 4$.

Applying proportional completion to a voting pattern where voters are indifferent between all candidates simply means that the weight of every other voting pattern is multiplicated by the same factor. Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_2^{1} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{1} = 48.421053$	1	1	1	1
#2	$w_2^{2} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{2} = 15.789474$	1	1	1	2
#3	$w_2^{3} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{3} = 25.263158$	1	1	1	3
#4	$w_2^{4} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{4} = 8.421053$	1	1	2	1
#5	$w_2^{5} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{5} = 10.526316$	1	1	2	2
#7	$w_2^{7} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{7} = 10.526316$	1	1	3	1
#9	$w_2^{9} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{9} = 20.000000$	1	1	3	3
#10	$w_2^{10} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{10} = 8.421053$	1	2	1	1
#11	$w_2^{11} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{11} = 30.526316$	1	2	1	2
#13	$w_2^{13} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{13} = 10.526316$	1	2	2	1
#14	$w_2^{14} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{14} = 27.368421$	1	2	2	2
#19	$w_2^{19} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{19} = 10.526316$	1	3	1	1
#21	$w_2^{21} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{21} = 15.789474$	1	3	1	3
#22	$w_2^{22} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{22} = 1.052632$	1	3	2	1
#25	$w_2^{25} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{25} = 9.473684$	1	3	3	1
#27	$w_2^{27} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{27} = 43.157895$	1	3	3	3
#28	$w_2^{28} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{28} = 3.157895$	2	1	1	1
#29	$w_2^{29} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{29} = 5.263158$	2	1	1	2
#31	$w_2^{31} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{31} = 5.263158$	2	1	2	1
#32	$w_2^{32} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{32} = 10.526316$	2	1	2	2
#37	$w_2^{37} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{37} = 7.368421$	2	2	1	1
#38	$w_2^{38} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{38} = 23.157895$	2	2	1	2
#40	$w_2^{40} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{40} = 14.736842$	2	2	2	1
#54	$w_2^{54} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{54} = 1.052632$	2	3	3	3
#55	$w_2^{55} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{55} = 1.052632$	3	1	1	1
#57	$w_2^{57} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{57} = 3.157895$	3	1	1	3
#61	$w_2^{61} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{61} = 4.210526$	3	1	3	1
#63	$w_2^{63} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{63} = 5.263158$	3	1	3	3
#73	$w_2^{73} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{73} = 4.210526$	3	3	1	1
#75	$w_2^{75} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{75} = 11.578947$	3	3	1	3
#79	$w_2^{79} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{79} = 6.315789$	3	3	3	1
#81	$w_2^{81} = (1 + w_1^{41} / W_1(\{a,c,d,h,i\})) \cdot w_1^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 3:

Proportional completion is applied to voting pattern #14 with $\mathfrak{N}(14) = 3$.

Voters with voting pattern #14 are indifferent between the candidates of the set $\{c,d,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{c,d,h,i\}$, rank these candidates. We get:

	c	*d*	*i*
$w_2^1 + w_2^{28} + w_2^{55} = 52.631579$	1	1	1
$w_2^2 + w_2^{29} = 21.052632$	1	1	2
$w_2^3 + w_2^{57} = 28.421053$	1	1	3
$w_2^4 + w_2^{31} = 13.684211$	1	2	1
$w_2^5 + w_2^{32} = 21.052632$	1	2	2
$w_2^7 + w_2^{61} = 14.736842$	1	3	1
$w_2^9 + w_2^{63} = 25.263158$	1	3	3
$w_2^{10} + w_2^{37} = 15.789474$	2	1	1
$w_2^{11} + w_2^{38} = 53.684211$	2	1	2
$w_2^{13} + w_2^{40} = 25.263158$	2	2	1
$w_2^{19} + w_2^{73} = 14.736842$	3	1	1
$w_2^{21} + w_2^{75} = 27.368421$	3	1	3
$w_2^{22} = 1.052632$	3	2	1
$w_2^{25} + w_2^{79} = 15.789474$	3	3	1
$w_2^{27} + w_2^{54} + w_2^{81} = 102.105263$	3	3	3
$W_2(\{c,d,h,i\}) = 432.631579$			

As voters with voting pattern #14 strictly prefer candidate *a* to candidate *h* and as there are w_2^{14} = 27.368421 voters with voting pattern #14, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_2^{1} + w_2^{28} + w_2^{55}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 3.329492$	1	1	1	1
$(w_2^{2} + w_2^{29}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.331797$	1	1	1	2
$(w_2^{3} + w_2^{57}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.797925$	1	1	1	3
$(w_2^{4} + w_2^{31}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.865668$	1	1	2	1
$(w_2^{5} + w_2^{32}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.331797$	1	1	2	2
$(w_2^{7} + w_2^{61}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.932258$	1	1	3	1
$(w_2^{9} + w_2^{63}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.598156$	1	1	3	3
$(w_2^{10} + w_2^{37}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.998848$	1	2	1	1
$(w_2^{11} + w_2^{38}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 3.396081$	1	2	1	2
$(w_2^{13} + w_2^{40}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.598156$	1	2	2	1
$(w_2^{19} + w_2^{73}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.932258$	1	3	1	1
$(w_2^{21} + w_2^{75}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 1.731336$	1	3	1	3
$w_2^{22} \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.066590$	1	3	2	1
$(w_2^{25} + w_2^{79}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 0.998848$	1	3	3	1
$(w_2^{27} + w_2^{54} + w_2^{81}) \cdot w_2^{14} / W_2(\{c,d,h,i\}) = 6.459214$	1	3	3	3
27.368421				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_3^1 = w_2^1 + 3.329492 = 51.750544$	1	1	1	1
#2	$w_3^2 = w_2^2 + 1.331797 = 17.121270$	1	1	1	2
#3	$w_3^3 = w_2^3 + 1.797925 = 27.061083$	1	1	1	3
#4	$w_3^4 = w_2^4 + 0.865668 = 9.286720$	1	1	2	1
#5	$w_3^5 = w_2^5 + 1.331797 = 11.858112$	1	1	2	2
#7	$w_3^7 = w_2^7 + 0.932258 = 11.458573$	1	1	3	1
#9	$w_3^9 = w_2^9 + 1.598156 = 21.598156$	1	1	3	3
#10	$w_3^{10} = w_2^{10} + 0.998848 = 9.419900$	1	2	1	1
#11	$w_3^{11} = w_2^{11} + 3.396081 = 33.922397$	1	2	1	2
#13	$w_3^{13} = w_2^{13} + 1.598156 = 12.124472$	1	2	2	1
#19	$w_3^{19} = w_2^{19} + 0.932258 = 11.458573$	1	3	1	1
#21	$w_3^{21} = w_2^{21} + 1.731336 = 17.520809$	1	3	1	3
#22	$w_3^{22} = w_2^{22} + 0.066590 = 1.119221$	1	3	2	1
#25	$w_3^{25} = w_2^{25} + 0.998848 = 10.472532$	1	3	3	1
#27	$w_3^{27} = w_2^{27} + 6.459214 = 49.617108$	1	3	3	3
#28	$w_3^{28} = w_2^{28} = 3.157895$	2	1	1	1
#29	$w_3^{29} = w_2^{29} = 5.263158$	2	1	1	2
#31	$w_3^{31} = w_2^{31} = 5.263158$	2	1	2	1
#32	$w_3^{32} = w_2^{32} = 10.526316$	2	1	2	2
#37	$w_3^{37} = w_2^{37} = 7.368421$	2	2	1	1
#38	$w_3^{38} = w_2^{38} = 23.157895$	2	2	1	2
#40	$w_3^{40} = w_2^{40} = 14.736842$	2	2	2	1
#54	$w_3^{54} = w_2^{54} = 1.052632$	2	3	3	3
#55	$w_3^{55} = w_2^{55} = 1.052632$	3	1	1	1
#57	$w_3^{57} = w_2^{57} = 3.157895$	3	1	1	3
#61	$w_3^{61} = w_2^{61} = 4.210526$	3	1	3	1
#63	$w_3^{63} = w_2^{63} = 5.263158$	3	1	3	3
#73	$w_3^{73} = w_2^{73} = 4.210526$	3	3	1	1
#75	$w_3^{75} = w_2^{75} = 11.578947$	3	3	1	3
#79	$w_3^{79} = w_2^{79} = 6.315789$	3	3	3	1
#81	$w_3^{81} = w_2^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 4:

Proportional completion is applied to voting pattern #32 with $\mathfrak{N}(32) = 3$.

Voters with voting pattern #32 are indifferent between the candidates of the set $\{a,d,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,d,h,i\}$, rank these candidates. We get:

	a	*d*	*i*
$w_3^{1} + w_3^{10} + w_3^{19} = 72.629018$	1	1	1
$w_3^{2} + w_3^{11} = 51.043668$	1	1	2
$w_3^{3} + w_3^{21} = 44.581893$	1	1	3
$w_3^{4} + w_3^{13} + w_3^{22} = 22.530414$	1	2	1
$w_3^{5} = 11.858112$	1	2	2
$w_3^{7} + w_3^{25} = 21.931105$	1	3	1
$w_3^{9} + w_3^{27} = 71.215264$	1	3	3
$w_3^{28} + w_3^{37} = 10.526316$	2	1	1
$w_3^{29} + w_3^{38} = 28.421053$	2	1	2
$w_3^{31} + w_3^{40} = 20.000000$	2	2	1
$w_3^{54} = 1.052632$	2	3	3
$w_3^{55} + w_3^{73} = 5.263158$	3	1	1
$w_3^{57} + w_3^{75} = 14.736842$	3	1	3
$w_3^{61} + w_3^{79} = 10.526316$	3	3	1
$w_3^{63} + w_3^{81} = 63.157895$	3	3	3
$W_3(\{a,d,h,i\}) = 449.473684$			

As voters with voting pattern #32 strictly prefer candidate *c* to candidate *h* and as there are w_3^{32} = 10.526316 voters with voting pattern #32, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_3^{1} + w_3^{10} + w_3^{19}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 1.700914	1	1	1	1
$(w_3^{2} + w_3^{11}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 1.195402	1	1	1	2
$(w_3^{3} + w_3^{21}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 1.044072	1	1	1	3
$(w_3^{4} + w_3^{13} + w_3^{22}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.527644	1	1	2	1
$w_3^{5} \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.277708	1	1	2	2
$(w_3^{7} + w_3^{25}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.513609	1	1	3	1
$(w_3^{9} + w_3^{27}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 1.667805	1	1	3	3
$(w_3^{28} + w_3^{37}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.246518	2	1	1	1
$(w_3^{29} + w_3^{38}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.665598	2	1	1	2
$(w_3^{31} + w_3^{40}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.468384	2	1	2	1
$w_3^{54} \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.024652	2	1	3	3
$(w_3^{55} + w_3^{73}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.123259	3	1	1	1
$(w_3^{57} + w_3^{75}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.345125	3	1	1	3
$(w_3^{61} + w_3^{79}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 0.246518	3	1	3	1
$(w_3^{63} + w_3^{81}) \cdot w_3^{32}$ / $W_3(\{a,d,h,i\})$ = 1.479108	3	1	3	3
10.526316				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_4^1 = w_3^1 + 1.700914 = 53.451458$	1	1	1	1
#2	$w_4^2 = w_3^2 + 1.195402 = 18.316672$	1	1	1	2
#3	$w_4^3 = w_3^3 + 1.044072 = 28.105156$	1	1	1	3
#4	$w_4^4 = w_3^4 + 0.527644 = 9.814365$	1	1	2	1
#5	$w_4^5 = w_3^5 + 0.277708 = 12.135820$	1	1	2	2
#7	$w_4^7 = w_3^7 + 0.513609 = 11.972182$	1	1	3	1
#9	$w_4^9 = w_3^9 + 1.667805 = 23.265961$	1	1	3	3
#10	$w_4^{10} = w_3^{10} = 9.419900$	1	2	1	1
#11	$w_4^{11} = w_3^{11} = 33.922397$	1	2	1	2
#13	$w_4^{13} = w_3^{13} = 12.124472$	1	2	2	1
#19	$w_4^{19} = w_3^{19} = 11.458573$	1	3	1	1
#21	$w_4^{21} = w_3^{21} = 17.520809$	1	3	1	3
#22	$w_4^{22} = w_3^{22} = 1.119221$	1	3	2	1
#25	$w_4^{25} = w_3^{25} = 10.472532$	1	3	3	1
#27	$w_4^{27} = w_3^{27} = 49.617108$	1	3	3	3
#28	$w_4^{28} = w_3^{28} + 0.246518 = 3.404413$	2	1	1	1
#29	$w_4^{29} = w_3^{29} + 0.665598 = 5.928756$	2	1	1	2
#31	$w_4^{31} = w_3^{31} + 0.468384 = 5.731542$	2	1	2	1
#36 (new)	$w_4^{36} = 0.024652$	2	1	3	3
#37	$w_4^{37} = w_3^{37} = 7.368421$	2	2	1	1
#38	$w_4^{38} = w_3^{38} = 23.157895$	2	2	1	2
#40	$w_4^{40} = w_3^{40} = 14.736842$	2	2	2	1
#54	$w_4^{54} = w_3^{54} = 1.052632$	2	3	3	3
#55	$w_4^{55} = w_3^{55} + 0.123259 = 1.175891$	3	1	1	1
#57	$w_4^{57} = w_3^{57} + 0.345125 = 3.503020$	3	1	1	3
#61	$w_4^{61} = w_3^{61} + 0.246518 = 4.457044$	3	1	3	1
#63	$w_4^{63} = w_3^{63} + 1.479108 = 6.742265$	3	1	3	3
#73	$w_4^{73} = w_3^{73} = 4.210526$	3	3	1	1
#75	$w_4^{75} = w_3^{75} = 11.578947$	3	3	1	3
#79	$w_4^{79} = w_3^{79} = 6.315789$	3	3	3	1
#81	$w_4^{81} = w_3^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 5:

Proportional completion is applied to voting pattern #38 with $\mathfrak{N}(38) = 3$.

Voters with voting pattern #38 are indifferent between the candidates of the set $\{a,c,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,c,h,i\}$, rank these candidates. We get:

	a	*c*	*i*
$w_4^1 + w_4^4 + w_4^7 = 75.238005$	1	1	1
$w_4^2 + w_4^5 = 30.452492$	1	1	2
$w_4^3 + w_4^9 = 51.371117$	1	1	3
$w_4^{10} + w_4^{13} = 21.544372$	1	2	1
$w_4^{11} = 33.922397$	1	2	2
$w_4^{19} + w_4^{22} + w_4^{25} = 23.050327$	1	3	1
$w_4^{21} + w_4^{27} = 67.137918$	1	3	3
$w_4^{28} + w_4^{31} = 9.135955$	2	1	1
$w_4^{29} = 5.928756$	2	1	2
$w_4^{36} = 0.024652$	2	1	3
$w_4^{37} + w_4^{40} = 22.105263$	2	2	1
$w_4^{54} = 1.052632$	2	3	3
$w_4^{55} + w_4^{61} = 5.632935$	3	1	1
$w_4^{57} + w_4^{63} = 10.245285$	3	1	3
$w_4^{73} + w_4^{79} = 10.526316$	3	3	1
$w_4^{75} + w_4^{81} = 69.473684$	3	3	3
$W_4(\{a,c,h,i\}) = 436.842105$			

As voters with voting pattern #38 strictly prefer candidate *d* to candidate *h* and as there are w_4^{38} = 23.157895 voters with voting pattern #38, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_4^{1} + w_4^{4} + w_4^{7}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 3.988521	1	1	1	1
$(w_4^{2} + w_4^{5}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 1.614349	1	1	1	2
$(w_4^{3} + w_4^{9}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 2.723288	1	1	1	3
$(w_4^{10} + w_4^{13}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 1.142111	1	2	1	1
$w_4^{11} \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 1.798296	1	2	1	2
$(w_4^{19} + w_4^{22} + w_4^{25}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 1.221945	1	3	1	1
$(w_4^{21} + w_4^{27}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 3.559119	1	3	1	3
$(w_4^{28} + w_4^{31}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.484316	2	1	1	1
$w_4^{29} \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.314296	2	1	1	2
$w_4^{36} \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.001307	2	1	1	3
$(w_4^{37} + w_4^{40}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 1.171845	2	2	1	1
$w_4^{54} \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.055802	2	3	1	3
$(w_4^{55} + w_4^{61}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.298613	3	1	1	1
$(w_4^{57} + w_4^{63}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.543124	3	1	1	3
$(w_4^{73} + w_4^{79}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 0.558022	3	3	1	1
$(w_4^{75} + w_4^{81}) \cdot w_4^{38}$ / $W_4(\{a,c,h,i\})$ = 3.682942	3	3	1	3
23.157895				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_5^1 = w_4^1 + 3.988521 = 57.439979$	1	1	1	1
#2	$w_5^2 = w_4^2 + 1.614349 = 19.931021$	1	1	1	2
#3	$w_5^3 = w_4^3 + 2.723288 = 30.828444$	1	1	1	3
#4	$w_5^4 = w_4^4 = 9.814365$	1	1	2	1
#5	$w_5^5 = w_4^5 = 12.135820$	1	1	2	2
#7	$w_5^7 = w_4^7 = 11.972182$	1	1	3	1
#9	$w_5^9 = w_4^9 = 23.265961$	1	1	3	3
#10	$w_5^{10} = w_4^{10} + 1.142111 = 10.562011$	1	2	1	1
#11	$w_5^{11} = w_4^{11} + 1.798296 = 35.720693$	1	2	1	2
#13	$w_5^{13} = w_4^{13} = 12.124472$	1	2	2	1
#19	$w_5^{19} = w_4^{19} + 1.221945 = 12.680518$	1	3	1	1
#21	$w_5^{21} = w_4^{21} + 3.559119 = 21.079928$	1	3	1	3
#22	$w_5^{22} = w_4^{22} = 1.119221$	1	3	2	1
#25	$w_5^{25} = w_4^{25} = 10.472532$	1	3	3	1
#27	$w_5^{27} = w_4^{27} = 49.617108$	1	3	3	3
#28	$w_5^{28} = w_4^{28} + 0.484316 = 3.888728$	2	1	1	1
#29	$w_5^{29} = w_4^{29} + 0.314296 = 6.243052$	2	1	1	2
#30 (new)	$w_5^{30} = 0.001307$	2	1	1	3
#31	$w_5^{31} = w_4^{31} = 5.731542$	2	1	2	1
#36	$w_5^{36} = w_4^{36} = 0.024652$	2	1	3	3
#37	$w_5^{37} = w_4^{37} + 1.171845 = 8.540266$	2	2	1	1
#40	$w_5^{40} = w_4^{40} = 14.736842$	2	2	2	1
#48 (new)	$w_5^{48} = 0.055802$	2	3	1	3
#54	$w_5^{54} = w_4^{54} = 1.052632$	2	3	3	3
#55	$w_5^{55} = w_4^{55} + 0.298613 = 1.474504$	3	1	1	1
#57	$w_5^{57} = w_4^{57} + 0.543124 = 4.046143$	3	1	1	3
#61	$w_5^{61} = w_4^{61} = 4.457044$	3	1	3	1
#63	$w_5^{63} = w_4^{63} = 6.742265$	3	1	3	3
#73	$w_5^{73} = w_4^{73} + 0.558022 = 4.768548$	3	3	1	1
#75	$w_5^{75} = w_4^{75} + 3.682942 = 15.261890$	3	3	1	3
#79	$w_5^{79} = w_4^{79} = 6.315789$	3	3	3	1
#81	$w_5^{81} = w_4^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 6:

Proportional completion is applied to voting pattern #40 with $\mathfrak{N}(40) = 3$.

Voters with voting pattern #40 are indifferent between the candidates of the set $\{a,c,d,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,c,d,h\}$, rank these candidates. We get:

	a	*c*	*d*
$w_5^1 + w_5^2 + w_5^3 = 108.199444$	1	1	1
$w_5^4 + w_5^5 = 21.950185$	1	1	2
$w_5^7 + w_5^9 = 35.238143$	1	1	3
$w_5^{10} + w_5^{11} = 46.282704$	1	2	1
$w_5^{13} = 12.124472$	1	2	2
$w_5^{19} + w_5^{21} = 33.760446$	1	3	1
$w_5^{22} = 1.119221$	1	3	2
$w_5^{25} + w_5^{27} = 60.089640$	1	3	3
$w_5^{28} + w_5^{29} + w_5^{30} = 10.133087$	2	1	1
$w_5^{31} = 5.731542$	2	1	2
$w_5^{36} = 0.024652$	2	1	3
$w_5^{37} = 8.540266$	2	2	1
$w_5^{48} = 0.055802$	2	3	1
$w_5^{54} = 1.052632$	2	3	3
$w_5^{55} + w_5^{57} = 5.520647$	3	1	1
$w_5^{61} + w_5^{63} = 11.199310$	3	1	3
$w_5^{73} + w_5^{75} = 20.030438$	3	3	1
$w_5^{79} + w_5^{81} = 64.210526$	3	3	3
$W_5(\{a,c,d,h\}) = 445.263158$			

As voters with voting pattern #40 strictly prefer candidate *i* to candidate *h* and as there are w_5^{40} = 14.736842 voters with voting pattern #40, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_5^1 + w_5^2 + w_5^3) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 3.581069$	1	1	1	1
$(w_5^4 + w_5^5) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.726484$	1	1	2	1
$(w_5^7 + w_5^9) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 1.166274$	1	1	3	1
$(w_5^{10} + w_5^{11}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 1.531815$	1	2	1	1
$w_5^{13} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.401283$	1	2	2	1
$(w_5^{19} + w_5^{21}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 1.117367$	1	3	1	1
$w_5^{22} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.037043$	1	3	2	1
$(w_5^{25} + w_5^{27}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 1.988782$	1	3	3	1
$(w_5^{28} + w_5^{29} + w_5^{30}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.335374$	2	1	1	1
$w_5^{31} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.189696$	2	1	2	1
$w_5^{36} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.000816$	2	1	3	1
$w_5^{37} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.282657$	2	2	1	1
$w_5^{48} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.001847$	2	3	1	1
$w_5^{54} \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.034839$	2	3	3	1
$(w_5^{55} + w_5^{57}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.182716$	3	1	1	1
$(w_5^{61} + w_5^{63}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.370663$	3	1	3	1
$(w_5^{73} + w_5^{75}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 0.662946$	3	3	1	1
$(w_5^{79} + w_5^{81}) \cdot w_5^{40} / W_5(\{a,c,d,h\}) = 2.125171$	3	3	3	1
14.736842				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^1_6 = w^1_5 + 3.581069 = 61.021048$	1	1	1	1
#2	$w^2_6 = w^2_5 = 19.931021$	1	1	1	2
#3	$w^3_6 = w^3_5 = 30.828444$	1	1	1	3
#4	$w^4_6 = w^4_5 + 0.726484 = 10.540848$	1	1	2	1
#5	$w^5_6 = w^5_5 = 12.135820$	1	1	2	2
#7	$w^7_6 = w^7_5 + 1.166274 = 13.138457$	1	1	3	1
#9	$w^9_6 = w^9_5 = 23.265961$	1	1	3	3
#10	$w^{10}_6 = w^{10}_5 + 1.531815 = 12.093827$	1	2	1	1
#11	$w^{11}_6 = w^{11}_5 = 35.720693$	1	2	1	2
#13	$w^{13}_6 = w^{13}_5 + 0.401283 = 12.525755$	1	2	2	1
#19	$w^{19}_6 = w^{19}_5 + 1.117367 = 13.797885$	1	3	1	1
#21	$w^{21}_6 = w^{21}_5 = 21.079928$	1	3	1	3
#22	$w^{22}_6 = w^{22}_5 + 0.037043 = 1.156264$	1	3	2	1
#25	$w^{25}_6 = w^{25}_5 + 1.988782 = 12.461314$	1	3	3	1
#27	$w^{27}_6 = w^{27}_5 = 49.617108$	1	3	3	3
#28	$w^{28}_6 = w^{28}_5 + 0.335374 = 4.224102$	2	1	1	1
#29	$w^{29}_6 = w^{29}_5 = 6.243052$	2	1	1	2
#30	$w^{30}_6 = w^{30}_5 = 0.001307$	2	1	1	3
#31	$w^{31}_6 = w^{31}_5 + 0.189696 = 5.921238$	2	1	2	1
#34 (new)	$w^{34}_6 = 0.000816$	2	1	3	1
#36	$w^{36}_6 = w^{36}_5 = 0.024652$	2	1	3	3
#37	$w^{37}_6 = w^{37}_5 + 0.282657 = 8.822923$	2	2	1	1
#46 (new)	$w^{46}_6 = 0.001847$	2	3	1	1
#48	$w^{48}_6 = w^{48}_5 = 0.055802$	2	3	1	3
#52 (new)	$w^{52}_6 = 0.034839$	2	3	3	1
#54	$w^{54}_6 = w^{54}_5 = 1.052632$	2	3	3	3
#55	$w^{55}_6 = w^{55}_5 + 0.182716 = 1.657220$	3	1	1	1
#57	$w^{57}_6 = w^{57}_5 = 4.046143$	3	1	1	3
#61	$w^{61}_6 = w^{61}_5 + 0.370663 = 4.827707$	3	1	3	1
#63	$w^{63}_6 = w^{63}_5 = 6.742265$	3	1	3	3
#73	$w^{73}_6 = w^{73}_5 + 0.662946 = 5.431494$	3	3	1	1
#75	$w^{75}_6 = w^{75}_5 = 15.261890$	3	3	1	3
#79	$w^{79}_6 = w^{79}_5 + 2.125171 = 8.440961$	3	3	3	1
#81	$w^{81}_6 = w^{81}_5 = 57.894737$	3	3	3	3
	460.000000				

Stage 7:

Proportional completion is applied to voting pattern #5 with $\mathfrak{N}(5) = 2$.

Voters with voting pattern #5 are indifferent between the candidates of the set $\{d,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{d,h,i\}$, rank these candidates. We get:

	d	*i*
$w_6^{1} + w_6^{10} + w_6^{19} + w_6^{28} + w_6^{37} + w_6^{46} + w_6^{55} + w_6^{73} =$ 107.050346	1	1
$w_6^{2} + w_6^{11} + w_6^{29} = 61.894766$	1	2
$w_6^{3} + w_6^{21} + w_6^{30} + w_6^{48} + w_6^{57} + w_6^{75} = 71.273514$	1	3
$w_6^{4} + w_6^{13} + w_6^{22} + w_6^{31} = 30.144106$	2	1
$w_6^{7} + w_6^{25} + w_6^{34} + w_6^{52} + w_6^{61} + w_6^{79} = 38.904093$	3	1
$w_6^{9} + w_6^{27} + w_6^{36} + w_6^{54} + w_6^{63} + w_6^{81} = 138.597355$	3	3
$W_6(\{d,h,i\}) = 447.864180$		

As voters with voting pattern #5 strictly prefer candidate *a* and candidate *c* to candidate *h* and as there are $w_6^{5} = 12.135820$ voters with voting pattern #5, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_6^{1} + w_6^{10} + w_6^{19} + w_6^{28} + w_6^{37} + w_6^{46} + w_6^{55} + w_6^{73}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 2.900754$	1	1	1	1
$(w_6^{2} + w_6^{11} + w_6^{29}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 1.677169$	1	1	1	2
$(w_6^{3} + w_6^{21} + w_6^{30} + w_6^{48} + w_6^{57} + w_6^{75}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 1.931305$	1	1	1	3
$(w_6^{4} + w_6^{13} + w_6^{22} + w_6^{31}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 0.816818$	1	1	2	1
$(w_6^{7} + w_6^{25} + w_6^{34} + w_6^{52} + w_6^{61} + w_6^{79}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 1.054188$	1	1	3	1
$(w_6^{9} + w_6^{27} + w_6^{36} + w_6^{54} + w_6^{63} + w_6^{81}) \cdot w_6^{5} / W_6(\{d,h,i\}) = 3.755586$	1	1	3	3
12.135820				

Therefore, we get:

voting pattern		a	c	d	i
#1	$w_7^1 = w_6^1 + 2.900754 = 63.921802$	1	1	1	1
#2	$w_7^2 = w_6^2 + 1.677169 = 21.608190$	1	1	1	2
#3	$w_7^3 = w_6^3 + 1.931305 = 32.759749$	1	1	1	3
#4	$w_7^4 = w_6^4 + 0.816818 = 11.357666$	1	1	2	1
#7	$w_7^7 = w_6^7 + 1.054188 = 14.192645$	1	1	3	1
#9	$w_7^9 = w_6^9 + 3.755586 = 27.021547$	1	1	3	3
#10	$w_7^{10} = w_6^{10} = 12.093827$	1	2	1	1
#11	$w_7^{11} = w_6^{11} = 35.720693$	1	2	1	2
#13	$w_7^{13} = w_6^{13} = 12.525755$	1	2	2	1
#19	$w_7^{19} = w_6^{19} = 13.797885$	1	3	1	1
#21	$w_7^{21} = w_6^{21} = 21.079928$	1	3	1	3
#22	$w_7^{22} = w_6^{22} = 1.156264$	1	3	2	1
#25	$w_7^{25} = w_6^{25} = 12.461314$	1	3	3	1
#27	$w_7^{27} = w_6^{27} = 49.617108$	1	3	3	3
#28	$w_7^{28} = w_6^{28} = 4.224102$	2	1	1	1
#29	$w_7^{29} = w_6^{29} = 6.243052$	2	1	1	2
#30	$w_7^{30} = w_6^{30} = 0.001307$	2	1	1	3
#31	$w_7^{31} = w_6^{31} = 5.921238$	2	1	2	1
#34	$w_7^{34} = w_6^{34} = 0.000816$	2	1	3	1
#36	$w_7^{36} = w_6^{36} = 0.024652$	2	1	3	3
#37	$w_7^{37} = w_6^{37} = 8.822923$	2	2	1	1
#46	$w_7^{46} = w_6^{46} = 0.001847$	2	3	1	1
#48	$w_7^{48} = w_6^{48} = 0.055802$	2	3	1	3
#52	$w_7^{52} = w_6^{52} = 0.034839$	2	3	3	1
#54	$w_7^{54} = w_6^{54} = 1.052632$	2	3	3	3
#55	$w_7^{55} = w_6^{55} = 1.657220$	3	1	1	1
#57	$w_7^{57} = w_6^{57} = 4.046143$	3	1	1	3
#61	$w_7^{61} = w_6^{61} = 4.827707$	3	1	3	1
#63	$w_7^{63} = w_6^{63} = 6.742265$	3	1	3	3
#73	$w_7^{73} = w_6^{73} = 5.431494$	3	3	1	1
#75	$w_7^{75} = w_6^{75} = 15.261890$	3	3	1	3
#79	$w_7^{79} = w_6^{79} = 8.440961$	3	3	3	1
#81	$w_7^{81} = w_6^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 8:

Proportional completion is applied to voting pattern #11 with $\mathfrak{N}(11) = 2$.

Voters with voting pattern #11 are indifferent between the candidates of the set $\{c,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{c,h,i\}$, rank these candidates. We get:

	c	*i*
$w_7^1 + w_7^4 + w_7^7 + w_7^{28} + w_7^{31} + w_7^{34} + w_7^{55} + w_7^{61} = 106.103197$	1	1
$w_7^2 + w_7^{29} = 27.851242$	1	2
$w_7^3 + w_7^9 + w_7^{30} + w_7^{36} + w_7^{57} + w_7^{63} = 70.595664$	1	3
$w_7^{10} + w_7^{13} + w_7^{37} = 33.442504$	2	1
$w_7^{19} + w_7^{22} + w_7^{25} + w_7^{46} + w_7^{52} + w_7^{73} + w_7^{79} = 41.324604$	3	1
$w_7^{21} + w_7^{27} + w_7^{48} + w_7^{54} + w_7^{75} + w_7^{81} = 144.962097$	3	3
$W_7(\{c,h,i\}) = 424.279307$		

As voters with voting pattern #11 strictly prefer candidate *a* and candidate *d* to candidate *h* and as there are $w_7^{11} = 35.720693$ voters with voting pattern #11, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_7^1 + w_7^4 + w_7^7 + w_7^{28} + w_7^{31} + w_7^{34} + w_7^{55} + w_7^{61}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 8.932983$	1	1	1	1
$(w_7^2 + w_7^{29}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 2.344837$	1	1	1	2
$(w_7^3 + w_7^9 + w_7^{30} + w_7^{36} + w_7^{55} + w_7^{63}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 5.943552$	1	1	1	3
$(w_7^{10} + w_7^{13} + w_7^{37}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 2.815573$	1	2	1	1
$(w_7^{19} + w_7^{22} + w_7^{25} + w_7^{46} + w_7^{52} + w_7^{73} + w_7^{79}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 3.479179$	1	3	1	1
$(w_7^{21} + w_7^{27} + w_7^{48} + w_7^{54} + w_7^{75} + w_7^{81}) \cdot w_7^{11} / W_7(\{c,h,i\}) = 12.204570$	1	3	1	3
35.720693				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_8^1 = w_7^1 + 8.932983 = 72.854784$	1	1	1	1
#2	$w_8^2 = w_7^2 + 2.344837 = 23.953027$	1	1	1	2
#3	$w_8^3 = w_7^3 + 5.943552 = 38.703301$	1	1	1	3
#4	$w_8^4 = w_7^4 = 11.357666$	1	1	2	1
#7	$w_8^7 = w_7^7 = 14.192645$	1	1	3	1
#9	$w_8^9 = w_7^9 = 27.021547$	1	1	3	3
#10	$w_8^{10} = w_7^{10} + 2.815573 = 14.909400$	1	2	1	1
#13	$w_8^{13} = w_7^{13} = 12.525755$	1	2	2	1
#19	$w_8^{19} = w_7^{19} + 3.479179 = 17.277064$	1	3	1	1
#21	$w_8^{21} = w_7^{21} + 12.204570 = 33.284498$	1	3	1	3
#22	$w_8^{22} = w_7^{22} = 1.156264$	1	3	2	1
#25	$w_8^{25} = w_7^{25} = 12.461314$	1	3	3	1
#27	$w_8^{27} = w_7^{27} = 49.617108$	1	3	3	3
#28	$w_8^{28} = w_7^{28} = 4.224102$	2	1	1	1
#29	$w_8^{29} = w_7^{29} = 6.243052$	2	1	1	2
#30	$w_8^{30} = w_7^{30} = 0.001307$	2	1	1	3
#31	$w_8^{31} = w_7^{31} = 5.921238$	2	1	2	1
#34	$w_8^{34} = w_7^{34} = 0.000816$	2	1	3	1
#36	$w_8^{36} = w_7^{36} = 0.024652$	2	1	3	3
#37	$w_8^{37} = w_7^{37} = 8.822923$	2	2	1	1
#46	$w_8^{46} = w_7^{46} = 0.001847$	2	3	1	1
#48	$w_8^{48} = w_7^{48} = 0.055802$	2	3	1	3
#52	$w_8^{52} = w_7^{52} = 0.034839$	2	3	3	1
#54	$w_8^{54} = w_7^{54} = 1.052632$	2	3	3	3
#55	$w_8^{55} = w_7^{55} = 1.657220$	3	1	1	1
#57	$w_8^{57} = w_7^{57} = 4.046143$	3	1	1	3
#61	$w_8^{61} = w_7^{61} = 4.827707$	3	1	3	1
#63	$w_8^{63} = w_7^{63} = 6.742265$	3	1	3	3
#73	$w_8^{73} = w_7^{73} = 5.431494$	3	3	1	1
#75	$w_8^{75} = w_7^{75} = 15.261890$	3	3	1	3
#79	$w_8^{79} = w_7^{79} = 8.440961$	3	3	3	1
#81	$w_8^{81} = w_7^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 9:

Proportional completion is applied to voting pattern #13 with $\mathfrak{N}(13) = 2$.

Voters with voting pattern #13 are indifferent between the candidates of the set $\{c,d,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{c,d,h\}$, rank these candidates. We get:

	c	d
$w_8^1 + w_8^2 + w_8^3 + w_8^{28} + w_8^{29} + w_8^{30} + w_8^{55} + w_8^{57} = 151.682937$	1	1
$w_8^4 + w_8^{31} = 17.278905$	1	2
$w_8^7 + w_8^9 + w_8^{34} + w_8^{36} + w_8^{61} + w_8^{63} = 52.809632$	1	3
$w_8^{10} + w_8^{37} = 23.732323$	2	1
$w_8^{19} + w_8^{21} + w_8^{46} + w_8^{48} + w_8^{73} + w_8^{75} = 71.312595$	3	1
$w_8^{22} = 1.156264$	3	2
$w_8^{25} + w_8^{27} + w_8^{52} + w_8^{54} + w_8^{79} + w_8^{81} = 129.501590$	3	3
$W_8(\{c,d,h\}) = 447.474245$		

As voters with voting pattern #13 strictly prefer candidate a and candidate i to candidate h and as there are $w_8^{13} = 12.525755$ voters with voting pattern #13, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_8^1 + w_8^2 + w_8^3 + w_8^{28} + w_8^{29} + w_8^{30} + w_8^{55} + w_8^{57}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 4.245928$	1	1	1	1
$(w_8^4 + w_8^{31}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 0.483673$	1	1	2	1
$(w_8^7 + w_8^9 + w_8^{34} + w_8^{36} + w_8^{61} + w_8^{63}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 1.478254$	1	1	3	1
$(w_8^{10} + w_8^{37}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 0.664318$	1	2	1	1
$(w_8^{19} + w_8^{21} + w_8^{46} + w_8^{48} + w_8^{73} + w_8^{75}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 1.996191$	1	3	1	1
$w_8^{22} \cdot w_8^{13} / W_8(\{c,d,h\}) = 0.032366$	1	3	2	1
$(w_8^{25} + w_8^{27} + w_8^{52} + w_8^{54} + w_8^{79} + w_8^{81}) \cdot w_8^{13} / W_8(\{c,d,h\}) = 3.625025$	1	3	3	1
12.525755				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_9^1 = w_8^1 + 4.245928 = 77.100712$	1	1	1	1
#2	$w_9^2 = w_8^2 = 23.953027$	1	1	1	2
#3	$w_9^3 = w_8^3 = 38.703301$	1	1	1	3
#4	$w_9^4 = w_8^4 + 0.483673 = 11.841340$	1	1	2	1
#7	$w_9^7 = w_8^7 + 1.478254 = 15.670899$	1	1	3	1
#9	$w_9^9 = w_8^9 = 27.021547$	1	1	3	3
#10	$w_9^{10} = w_8^{10} + 0.664318 = 15.573718$	1	2	1	1
#19	$w_9^{19} = w_8^{19} + 1.996191 = 19.273255$	1	3	1	1
#21	$w_9^{21} = w_8^{21} = 33.284498$	1	3	1	3
#22	$w_9^{22} = w_8^{22} + 0.032366 = 1.188630$	1	3	2	1
#25	$w_9^{25} = w_8^{25} + 3.625025 = 16.086339$	1	3	3	1
#27	$w_9^{27} = w_8^{27} = 49.617108$	1	3	3	3
#28	$w_9^{28} = w_8^{28} = 4.224102$	2	1	1	1
#29	$w_9^{29} = w_8^{29} = 6.243052$	2	1	1	2
#30	$w_9^{30} = w_8^{30} = 0.001307$	2	1	1	3
#31	$w_9^{31} = w_8^{31} = 5.921238$	2	1	2	1
#34	$w_9^{34} = w_8^{34} = 0.000816$	2	1	3	1
#36	$w_9^{36} = w_8^{36} = 0.024652$	2	1	3	3
#37	$w_9^{37} = w_8^{37} = 8.822923$	2	2	1	1
#46	$w_9^{46} = w_8^{46} = 0.001847$	2	3	1	1
#48	$w_9^{48} = w_8^{48} = 0.055802$	2	3	1	3
#52	$w_9^{52} = w_8^{52} = 0.034839$	2	3	3	1
#54	$w_9^{54} = w_8^{54} = 1.052632$	2	3	3	3
#55	$w_9^{55} = w_8^{55} = 1.657220$	3	1	1	1
#57	$w_9^{57} = w_8^{57} = 4.046143$	3	1	1	3
#61	$w_9^{61} = w_8^{61} = 4.827707$	3	1	3	1
#63	$w_9^{63} = w_8^{63} = 6.742265$	3	1	3	3
#73	$w_9^{73} = w_8^{73} = 5.431494$	3	3	1	1
#75	$w_9^{75} = w_8^{75} = 15.261890$	3	3	1	3
#79	$w_9^{79} = w_8^{79} = 8.440961$	3	3	3	1
#81	$w_9^{81} = w_8^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 10:

Proportional completion is applied to voting pattern #29 with $\mathfrak{N}(29) = 2$.

Voters with voting pattern #29 are indifferent between the candidates of the set $\{a,h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h,i\}$, rank these candidates. We get:

	a	i
$w_9^1 + w_9^4 + w_9^7 + w_9^{10} + w_9^{19} + w_9^{22} + w_9^{25} = 156.734892$	1	1
$w_9^2 = 23.953027$	1	2
$w_9^3 + w_9^9 + w_9^{21} + w_9^{27} = 148.626455$	1	3
$w_9^{28} + w_9^{31} + w_9^{34} + w_9^{37} + w_9^{46} + w_9^{52} = 19.005765$	2	1
$w_9^{30} + w_9^{36} + w_9^{48} + w_9^{54} = 1.134392$	2	3
$w_9^{55} + w_9^{61} + w_9^{73} + w_9^{79} = 20.357382$	3	1
$w_9^{57} + w_9^{63} + w_9^{75} + w_9^{81} = 83.945035$	3	3
$W_9(\{a,h,i\}) = 453.756948$		

As voters with voting pattern #29 strictly prefer candidate c and candidate d to candidate h and as there are $w_9^{29} = 6.243052$ voters with voting pattern #29, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_9^1 + w_9^4 + w_9^7 + w_9^{10} + w_9^{19} + w_9^{22} + w_9^{25}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 2.156450$	1	1	1	1
$w_9^2 \cdot w_9^{29} / W_9(\{a,h,i\}) = 0.329560$	1	1	1	2
$(w_9^3 + w_9^9 + w_9^{21} + w_9^{27}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 2.044889$	1	1	1	3
$(w_9^{28} + w_9^{31} + w_9^{34} + w_9^{37} + w_9^{46} + w_9^{52}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 0.261492$	2	1	1	1
$(w_9^{30} + w_9^{36} + w_9^{48} + w_9^{54}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 0.015608$	2	1	1	3
$(w_9^{55} + w_9^{61} + w_9^{73} + w_9^{79}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 0.280089$	3	1	1	1
$(w_9^{57} + w_9^{63} + w_9^{75} + w_9^{81}) \cdot w_9^{29} / W_9(\{a,h,i\}) = 1.154965$	3	1	1	3
6.243052				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_{10}^{1} = w_{9}^{1} + 2.156450 = 79.257162$	1	1	1	1
#2	$w_{10}^{2} = w_{9}^{2} + 0.329560 = 24.282586$	1	1	1	2
#3	$w_{10}^{3} = w_{9}^{3} + 2.044889 = 40.748190$	1	1	1	3
#4	$w_{10}^{4} = w_{9}^{4} = 11.841340$	1	1	2	1
#7	$w_{10}^{7} = w_{9}^{7} = 15.670899$	1	1	3	1
#9	$w_{10}^{9} = w_{9}^{9} = 27.021547$	1	1	3	3
#10	$w_{10}^{10} = w_{9}^{10} = 15.573718$	1	2	1	1
#19	$w_{10}^{19} = w_{9}^{19} = 19.273255$	1	3	1	1
#21	$w_{10}^{21} = w_{9}^{21} = 33.284498$	1	3	1	3
#22	$w_{10}^{22} = w_{9}^{22} = 1.188630$	1	3	2	1
#25	$w_{10}^{25} = w_{9}^{25} = 16.086339$	1	3	3	1
#27	$w_{10}^{27} = w_{9}^{27} = 49.617108$	1	3	3	3
#28	$w_{10}^{28} = w_{9}^{28} + 0.261492 = 4.485595$	2	1	1	1
#30	$w_{10}^{30} = w_{9}^{30} + 0.015608 = 0.016914$	2	1	1	3
#31	$w_{10}^{31} = w_{9}^{31} = 5.921238$	2	1	2	1
#34	$w_{10}^{34} = w_{9}^{34} = 0.000816$	2	1	3	1
#36	$w_{10}^{36} = w_{9}^{36} = 0.024652$	2	1	3	3
#37	$w_{10}^{37} = w_{9}^{37} = 8.822923$	2	2	1	1
#46	$w_{10}^{46} = w_{9}^{46} = 0.001847$	2	3	1	1
#48	$w_{10}^{48} = w_{9}^{48} = 0.055802$	2	3	1	3
#52	$w_{10}^{52} = w_{9}^{52} = 0.034839$	2	3	3	1
#54	$w_{10}^{54} = w_{9}^{54} = 1.052632$	2	3	3	3
#55	$w_{10}^{55} = w_{9}^{55} + 0.280089 = 1.937309$	3	1	1	1
#57	$w_{10}^{57} = w_{9}^{57} + 1.154965 = 5.201108$	3	1	1	3
#61	$w_{10}^{61} = w_{9}^{61} = 4.827707$	3	1	3	1
#63	$w_{10}^{63} = w_{9}^{63} = 6.742265$	3	1	3	3
#73	$w_{10}^{73} = w_{9}^{73} = 5.431494$	3	3	1	1
#75	$w_{10}^{75} = w_{9}^{75} = 15.261890$	3	3	1	3
#79	$w_{10}^{79} = w_{9}^{79} = 8.440961$	3	3	3	1
#81	$w_{10}^{81} = w_{9}^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 11:

Proportional completion is applied to voting pattern #31 with $\mathfrak{N}(31) = 2$.

Voters with voting pattern #31 are indifferent between the candidates of the set $\{a,d,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,d,h\}$, rank these candidates. We get:

	a	d
$w_{10}^{1} + w_{10}^{2} + w_{10}^{3} + w_{10}^{10} + w_{10}^{19} + w_{10}^{21} = 212.419409$	1	1
$w_{10}^{4} + w_{10}^{22} = 13.029970$	1	2
$w_{10}^{7} + w_{10}^{9} + w_{10}^{25} + w_{10}^{27} = 108.395893$	1	3
$w_{10}^{28} + w_{10}^{30} + w_{10}^{37} + w_{10}^{46} + w_{10}^{48} = 13.383081$	2	1
$w_{10}^{34} + w_{10}^{36} + w_{10}^{52} + w_{10}^{54} = 1.112938$	2	3
$w_{10}^{55} + w_{10}^{57} + w_{10}^{73} + w_{10}^{75} = 27.831801$	3	1
$w_{10}^{61} + w_{10}^{63} + w_{10}^{79} + w_{10}^{81} = 77.905670$	3	3
$W_{10}(\{a,d,h\}) = 454.078762$		

As voters with voting pattern #31 strictly prefer candidate c and candidate i to candidate h and as there are $w_{10}^{31} = 5.921238$ voters with voting pattern #31, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{10}^{1} + w_{10}^{2} + w_{10}^{3} + w_{10}^{10} + w_{10}^{19} + w_{10}^{21}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 2.769973$	1	1	1	1
$(w_{10}^{4} + w_{10}^{22}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 0.169912$	1	1	2	1
$(w_{10}^{7} + w_{10}^{9} + w_{10}^{25} + w_{10}^{27}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 1.413495$	1	1	3	1
$(w_{10}^{28} + w_{10}^{30} + w_{10}^{37} + w_{10}^{46} + w_{10}^{48}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 0.174517$	2	1	1	1
$(w_{10}^{34} + w_{10}^{36} + w_{10}^{52} + w_{10}^{54}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 0.014513$	2	1	3	1
$(w_{10}^{55} + w_{10}^{57} + w_{10}^{73} + w_{10}^{75}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 0.362930$	3	1	1	1
$(w_{10}^{61} + w_{10}^{63} + w_{10}^{79} + w_{10}^{81}) \cdot w_{10}^{31} / W_{10}(\{a,d,h\}) = 1.015899$	3	1	3	1
5.921238				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{11} = w^{1}_{10} + 2.769973 = 82.027135$	1	1	1	1
#2	$w^{2}_{11} = w^{2}_{10} = 24.282586$	1	1	1	2
#3	$w^{3}_{11} = w^{3}_{10} = 40.748190$	1	1	1	3
#4	$w^{4}_{11} = w^{4}_{10} + 0.169912 = 12.011252$	1	1	2	1
#7	$w^{7}_{11} = w^{7}_{10} + 1.413495 = 17.084393$	1	1	3	1
#9	$w^{9}_{11} = w^{9}_{10} = 27.021547$	1	1	3	3
#10	$w^{10}_{11} = w^{10}_{10} = 15.573718$	1	2	1	1
#19	$w^{19}_{11} = w^{19}_{10} = 19.273255$	1	3	1	1
#21	$w^{21}_{11} = w^{21}_{10} = 33.284498$	1	3	1	3
#22	$w^{22}_{11} = w^{22}_{10} = 1.188630$	1	3	2	1
#25	$w^{25}_{11} = w^{25}_{10} = 16.086339$	1	3	3	1
#27	$w^{27}_{11} = w^{27}_{10} = 49.617108$	1	3	3	3
#28	$w^{28}_{11} = w^{28}_{10} + 0.174517 = 4.660112$	2	1	1	1
#30	$w^{30}_{11} = w^{30}_{10} = 0.016914$	2	1	1	3
#34	$w^{34}_{11} = w^{34}_{10} + 0.014513 = 0.015329$	2	1	3	1
#36	$w^{36}_{11} = w^{36}_{10} = 0.024652$	2	1	3	3
#37	$w^{37}_{11} = w^{37}_{10} = 8.822923$	2	2	1	1
#46	$w^{46}_{11} = w^{46}_{10} = 0.001847$	2	3	1	1
#48	$w^{48}_{11} = w^{48}_{10} = 0.055802$	2	3	1	3
#52	$w^{52}_{11} = w^{52}_{10} = 0.034839$	2	3	3	1
#54	$w^{54}_{11} = w^{54}_{10} = 1.052632$	2	3	3	3
#55	$w^{55}_{11} = w^{55}_{10} + 0.362930 = 2.300239$	3	1	1	1
#57	$w^{57}_{11} = w^{57}_{10} = 5.201108$	3	1	1	3
#61	$w^{61}_{11} = w^{61}_{10} + 1.015899 = 5.843606$	3	1	3	1
#63	$w^{63}_{11} = w^{63}_{10} = 6.742265$	3	1	3	3
#73	$w^{73}_{11} = w^{73}_{10} = 5.431494$	3	3	1	1
#75	$w^{75}_{11} = w^{75}_{10} = 15.261890$	3	3	1	3
#79	$w^{79}_{11} = w^{79}_{10} = 8.440961$	3	3	3	1
#81	$w^{81}_{11} = w^{81}_{10} = 57.894737$	3	3	3	3
	460.000000				

Stage 12:

Proportional completion is applied to voting pattern #37 with $\mathfrak{N}(37) = 2$.

Voters with voting pattern #37 are indifferent between the candidates of the set $\{a,c,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,c,h\}$, rank these candidates. We get:

	a	*c*
$w_{11}^{1} + w_{11}^{2} + w_{11}^{3} + w_{11}^{4} + w_{11}^{7} + w_{11}^{9} = 203.175103$	1	1
$w_{11}^{10} = 15.573718$	1	2
$w_{11}^{19} + w_{11}^{21} + w_{11}^{22} + w_{11}^{25} + w_{11}^{27} = 119.449831$	1	3
$w_{11}^{28} + w_{11}^{30} + w_{11}^{34} + w_{11}^{36} = 4.717007$	2	1
$w_{11}^{46} + w_{11}^{48} + w_{11}^{52} + w_{11}^{54} = 1.145119$	2	3
$w_{11}^{55} + w_{11}^{57} + w_{11}^{61} + w_{11}^{63} = 20.087218$	3	1
$w_{11}^{73} + w_{11}^{75} + w_{11}^{79} + w_{11}^{81} = 87.029081$	3	3
$W_{11}(\{a,c,h\}) = 451.177077$		

As voters with voting pattern #37 strictly prefer candidate *d* and candidate *i* to candidate *h* and as there are $w_{11}^{37} = 8.822923$ voters with voting pattern #37, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{11}^{1} + w_{11}^{2} + w_{11}^{3} + w_{11}^{4} + w_{11}^{7} + w_{11}^{9}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 3.973159$	1	1	1	1
$w_{11}^{10} \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 0.304549$	1	2	1	1
$(w_{11}^{19} + w_{11}^{21} + w_{11}^{22} + w_{11}^{25} + w_{11}^{27}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 2.335883$	1	3	1	1
$(w_{11}^{28} + w_{11}^{30} + w_{11}^{34} + w_{11}^{36}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 0.092243$	2	1	1	1
$(w_{11}^{46} + w_{11}^{48} + w_{11}^{52} + w_{11}^{54}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 0.022393$	2	3	1	1
$(w_{11}^{55} + w_{11}^{57} + w_{11}^{61} + w_{11}^{63}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 0.392812$	3	1	1	1
$(w_{11}^{73} + w_{11}^{75} + w_{11}^{79} + w_{11}^{81}) \cdot w_{11}^{37} / W_{11}(\{a,c,h\}) = 1.701884$	3	3	1	1
8.822923				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{12} = w^{1}_{11} + 3.973159 = 86.000294$	1	1	1	1
#2	$w^{2}_{12} = w^{2}_{11} = 24.282586$	1	1	1	2
#3	$w^{3}_{12} = w^{3}_{11} = 40.748190$	1	1	1	3
#4	$w^{4}_{12} = w^{4}_{11} = 12.011252$	1	1	2	1
#7	$w^{7}_{12} = w^{7}_{11} = 17.084393$	1	1	3	1
#9	$w^{9}_{12} = w^{9}_{11} = 27.021547$	1	1	3	3
#10	$w^{10}_{12} = w^{10}_{11} + 0.304549 = 15.878267$	1	2	1	1
#19	$w^{19}_{12} = w^{19}_{11} + 2.335883 = 21.609138$	1	3	1	1
#21	$w^{21}_{12} = w^{21}_{11} = 33.284498$	1	3	1	3
#22	$w^{22}_{12} = w^{22}_{11} = 1.188630$	1	3	2	1
#25	$w^{25}_{12} = w^{25}_{11} = 16.086339$	1	3	3	1
#27	$w^{27}_{12} = w^{27}_{11} = 49.617108$	1	3	3	3
#28	$w^{28}_{12} = w^{28}_{11} + 0.092243 = 4.752354$	2	1	1	1
#30	$w^{30}_{12} = w^{30}_{11} = 0.016914$	2	1	1	3
#34	$w^{34}_{12} = w^{34}_{11} = 0.015329$	2	1	3	1
#36	$w^{36}_{12} = w^{36}_{11} = 0.024652$	2	1	3	3
#46	$w^{46}_{12} = w^{46}_{11} + 0.022393 = 0.024240$	2	3	1	1
#48	$w^{48}_{12} = w^{48}_{11} = 0.055802$	2	3	1	3
#52	$w^{52}_{12} = w^{52}_{11} = 0.034839$	2	3	3	1
#54	$w^{54}_{12} = w^{54}_{11} = 1.052632$	2	3	3	3
#55	$w^{55}_{12} = w^{55}_{11} + 0.392812 = 2.693051$	3	1	1	1
#57	$w^{57}_{12} = w^{57}_{11} = 5.201108$	3	1	1	3
#61	$w^{61}_{12} = w^{61}_{11} = 5.843606$	3	1	3	1
#63	$w^{63}_{12} = w^{63}_{11} = 6.742265$	3	1	3	3
#73	$w^{73}_{12} = w^{73}_{11} + 1.701884 = 7.133377$	3	3	1	1
#75	$w^{75}_{12} = w^{75}_{11} = 15.261890$	3	3	1	3
#79	$w^{79}_{12} = w^{79}_{11} = 8.440961$	3	3	3	1
#81	$w^{81}_{12} = w^{81}_{11} = 57.894737$	3	3	3	3
	460.000000				

Stage 13:

Proportional completion is applied to voting pattern #2 with $\mathfrak{N}(2) = 1$.

Voters with voting pattern #2 are indifferent between the candidates of the set $\{h,i\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{h,i\}$, rank these candidates. We get:

	i
$w_{12}^{1} + w_{12}^{4} + w_{12}^{7} + w_{12}^{10} + w_{12}^{19} + w_{12}^{22} + w_{12}^{25} + w_{12}^{28} + w_{12}^{34} + w_{12}^{46} + w_{12}^{52} + w_{12}^{55} + w_{12}^{61} + w_{12}^{73} + w_{12}^{79} = 198.796070$	1
$w_{12}^{3} + w_{12}^{9} + w_{12}^{21} + w_{12}^{27} + w_{12}^{30} + w_{12}^{36} + w_{12}^{48} + w_{12}^{54} + w_{12}^{57} + w_{12}^{63} + w_{12}^{75} + w_{12}^{81} = 236.921344$	3
$W_{12}(\{h,i\}) = 435.717414$	

As voters with voting pattern #2 strictly prefer candidate a, candidate c, and candidate d to candidate h and as there are $w_{12}^{2} = 24.282586$ voters with voting pattern #2, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{12}^{1} + w_{12}^{4} + w_{12}^{7} + w_{12}^{10} + w_{12}^{19} + w_{12}^{22} + w_{12}^{25} + w_{12}^{28} + w_{12}^{34} + w_{12}^{46} + w_{12}^{52} + w_{12}^{55} + w_{12}^{61} + w_{12}^{73} + w_{12}^{79}) \cdot w_{12}^{2} / W_{12}(\{h,i\}) = 11.078930$	1	1	1	1
$(w_{12}^{3} + w_{12}^{9} + w_{12}^{21} + w_{12}^{27} + w_{12}^{30} + w_{12}^{36} + w_{12}^{48} + w_{12}^{54} + w_{12}^{57} + w_{12}^{63} + w_{12}^{75} + w_{12}^{81}) \cdot w_{12}^{2} / W_{12}(\{h,i\}) = 13.203656$	1	1	1	3
24.282586				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{13} = w^{1}_{12} + 11.078930 = 97.079224$	1	1	1	1
#3	$w^{3}_{13} = w^{3}_{12} + 13.203656 = 53.951847$	1	1	1	3
#4	$w^{4}_{13} = w^{4}_{12} = 12.011252$	1	1	2	1
#7	$w^{7}_{13} = w^{7}_{12} = 17.084393$	1	1	3	1
#9	$w^{9}_{13} = w^{9}_{12} = 27.021547$	1	1	3	3
#10	$w^{10}_{13} = w^{10}_{12} = 15.878267$	1	2	1	1
#19	$w^{19}_{13} = w^{19}_{12} = 21.609138$	1	3	1	1
#21	$w^{21}_{13} = w^{21}_{12} = 33.284498$	1	3	1	3
#22	$w^{22}_{13} = w^{22}_{12} = 1.188630$	1	3	2	1
#25	$w^{25}_{13} = w^{25}_{12} = 16.086339$	1	3	3	1
#27	$w^{27}_{13} = w^{27}_{12} = 49.617108$	1	3	3	3
#28	$w^{28}_{13} = w^{28}_{12} = 4.752354$	2	1	1	1
#30	$w^{30}_{13} = w^{30}_{12} = 0.016914$	2	1	1	3
#34	$w^{34}_{13} = w^{34}_{12} = 0.015329$	2	1	3	1
#36	$w^{36}_{13} = w^{36}_{12} = 0.024652$	2	1	3	3
#46	$w^{46}_{13} = w^{46}_{12} = 0.024240$	2	3	1	1
#48	$w^{48}_{13} = w^{48}_{12} = 0.055802$	2	3	1	3
#52	$w^{52}_{13} = w^{52}_{12} = 0.034839$	2	3	3	1
#54	$w^{54}_{13} = w^{54}_{12} = 1.052632$	2	3	3	3
#55	$w^{55}_{13} = w^{55}_{12} = 2.693051$	3	1	1	1
#57	$w^{57}_{13} = w^{57}_{12} = 5.201108$	3	1	1	3
#61	$w^{61}_{13} = w^{61}_{12} = 5.843606$	3	1	3	1
#63	$w^{63}_{13} = w^{63}_{12} = 6.742265$	3	1	3	3
#73	$w^{73}_{13} = w^{73}_{12} = 7.133377$	3	3	1	1
#75	$w^{75}_{13} = w^{75}_{12} = 15.261890$	3	3	1	3
#79	$w^{79}_{13} = w^{79}_{12} = 8.440961$	3	3	3	1
#81	$w^{81}_{13} = w^{81}_{12} = 57.894737$	3	3	3	3
	460.000000				

Stage 14:

Proportional completion is applied to voting pattern #4 with $\mathfrak{N}(4) = 1$.

Voters with voting pattern #4 are indifferent between the candidates of the set $\{d,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{d,h\}$, rank these candidates. We get:

	d
$w_{13}^{1} + w_{13}^{3} + w_{13}^{10} + w_{13}^{19} + w_{13}^{21} + w_{13}^{28} + w_{13}^{30} + w_{13}^{46} + w_{13}^{48} + w_{13}^{55} + w_{13}^{57} + w_{13}^{73} + w_{13}^{75} = 256.941711$	1
$w_{13}^{7} + w_{13}^{9} + w_{13}^{25} + w_{13}^{27} + w_{13}^{34} + w_{13}^{36} + w_{13}^{52} + w_{13}^{54} + w_{13}^{61} + w_{13}^{63} + w_{13}^{79} + w_{13}^{81} = 189.858407$	3
$W_{13}(\{d,h\}) = 446.800118$	

As voters with voting pattern #4 strictly prefer candidate a, candidate c, and candidate i to candidate h and as there are $w_{13}^{4} = 12.011252$ voters with voting pattern #4, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{13}^{1} + w_{13}^{3} + w_{13}^{10} + w_{13}^{19} + w_{13}^{21} + w_{13}^{28} + w_{13}^{30} + w_{13}^{46} + w_{13}^{48} + w_{13}^{55} + w_{13}^{57} + w_{13}^{73} + w_{13}^{75}) \cdot w_{13}^{4} \,/\, W_{13}(\{d,h\}) = 6.907321$	1	1	1	1
$(w_{13}^{7} + w_{13}^{9} + w_{13}^{25} + w_{13}^{27} + w_{13}^{34} + w_{13}^{36} + w_{13}^{52} + w_{13}^{54} + w_{13}^{61} + w_{13}^{63} + w_{13}^{79} + w_{13}^{81}) \cdot w_{13}^{4} \,/\, W_{13}(\{d,h\}) = 5.103931$	1	1	3	1
12.011252				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{14} = w^{1}_{13} + 6.907321 = 103.986544$	1	1	1	1
#3	$w^{3}_{14} = w^{3}_{13} = 53.951847$	1	1	1	3
#7	$w^{7}_{14} = w^{7}_{13} + 5.103931 = 22.188325$	1	1	3	1
#9	$w^{9}_{14} = w^{9}_{13} = 27.021547$	1	1	3	3
#10	$w^{10}_{14} = w^{10}_{13} = 15.878267$	1	2	1	1
#19	$w^{19}_{14} = w^{19}_{13} = 21.609138$	1	3	1	1
#21	$w^{21}_{14} = w^{21}_{13} = 33.284498$	1	3	1	3
#22	$w^{22}_{14} = w^{22}_{13} = 1.188630$	1	3	2	1
#25	$w^{25}_{14} = w^{25}_{13} = 16.086339$	1	3	3	1
#27	$w^{27}_{14} = w^{27}_{13} = 49.617108$	1	3	3	3
#28	$w^{28}_{14} = w^{28}_{13} = 4.752354$	2	1	1	1
#30	$w^{30}_{14} = w^{30}_{13} = 0.016914$	2	1	1	3
#34	$w^{34}_{14} = w^{34}_{13} = 0.015329$	2	1	3	1
#36	$w^{36}_{14} = w^{36}_{13} = 0.024652$	2	1	3	3
#46	$w^{46}_{14} = w^{46}_{13} = 0.024240$	2	3	1	1
#48	$w^{48}_{14} = w^{48}_{13} = 0.055802$	2	3	1	3
#52	$w^{52}_{14} = w^{52}_{13} = 0.034839$	2	3	3	1
#54	$w^{54}_{14} = w^{54}_{13} = 1.052632$	2	3	3	3
#55	$w^{55}_{14} = w^{55}_{13} = 2.693051$	3	1	1	1
#57	$w^{57}_{14} = w^{57}_{13} = 5.201108$	3	1	1	3
#61	$w^{61}_{14} = w^{61}_{13} = 5.843606$	3	1	3	1
#63	$w^{63}_{14} = w^{63}_{13} = 6.742265$	3	1	3	3
#73	$w^{73}_{14} = w^{73}_{13} = 7.133377$	3	3	1	1
#75	$w^{75}_{14} = w^{75}_{13} = 15.261890$	3	3	1	3
#79	$w^{79}_{14} = w^{79}_{13} = 8.440961$	3	3	3	1
#81	$w^{81}_{14} = w^{81}_{13} = 57.894737$	3	3	3	3
	460.000000				

Stage 15:

Proportional completion is applied to voting pattern #10 with $\mathfrak{N}(10) = 1$.

Voters with voting pattern #10 are indifferent between the candidates of the set $\{c,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{c,h\}$, rank these candidates. We get:

	c
$w_{14}^{1} + w_{14}^{3} + w_{14}^{7} + w_{14}^{9} + w_{14}^{28} + w_{14}^{30} + w_{14}^{34} + w_{14}^{36} + w_{14}^{55} + w_{14}^{57} + w_{14}^{61} + w_{14}^{63} = 232.437542$	1
$w_{14}^{19} + w_{14}^{21} + w_{14}^{22} + w_{14}^{25} + w_{14}^{27} + w_{14}^{46} + w_{14}^{48} + w_{14}^{52} + w_{14}^{54} + w_{14}^{73} + w_{14}^{75} + w_{14}^{79} + w_{14}^{81} = 211.684190$	3
$W_{14}(\{c,h\}) = 444.121733$	

As voters with voting pattern #10 strictly prefer candidate a, candidate d, and candidate i to candidate h and as there are $w_{14}^{10} = 15.878267$ voters with voting pattern #10, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{14}^{1} + w_{14}^{3} + w_{14}^{7} + w_{14}^{9} + w_{14}^{28} + w_{14}^{30} + w_{14}^{34} + w_{14}^{36} + w_{14}^{55} + w_{14}^{57} + w_{14}^{61} + w_{14}^{63}) \cdot w_{14}^{10} / W_{14}(\{c,h\}) = 8.310121$	1	1	1	1
$(w_{14}^{19} + w_{14}^{21} + w_{14}^{22} + w_{14}^{25} + w_{14}^{27} + w_{14}^{46} + w_{14}^{48} + w_{14}^{52} + w_{14}^{54} + w_{14}^{73} + w_{14}^{75} + w_{14}^{79} + w_{14}^{81}) \cdot w_{14}^{10} / W_{14}(\{c,h\}) = 7.568146$	1	3	1	1
15.878267				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{15} = w^{1}_{14} + 8.310121 = 112.296665$	1	1	1	1
#3	$w^{3}_{15} = w^{3}_{14} = 53.951847$	1	1	1	3
#7	$w^{7}_{15} = w^{7}_{14} = 22.188325$	1	1	3	1
#9	$w^{9}_{15} = w^{9}_{14} = 27.021547$	1	1	3	3
#19	$w^{19}_{15} = w^{19}_{14} + 7.568146 = 29.177284$	1	3	1	1
#21	$w^{21}_{15} = w^{21}_{14} = 33.284498$	1	3	1	3
#22	$w^{22}_{15} = w^{22}_{14} = 1.188630$	1	3	2	1
#25	$w^{25}_{15} = w^{25}_{14} = 16.086339$	1	3	3	1
#27	$w^{27}_{15} = w^{27}_{14} = 49.617108$	1	3	3	3
#28	$w^{28}_{15} = w^{28}_{14} = 4.752354$	2	1	1	1
#30	$w^{30}_{15} = w^{30}_{14} = 0.016914$	2	1	1	3
#34	$w^{34}_{15} = w^{34}_{14} = 0.015329$	2	1	3	1
#36	$w^{36}_{15} = w^{36}_{14} = 0.024652$	2	1	3	3
#46	$w^{46}_{15} = w^{46}_{14} = 0.024240$	2	3	1	1
#48	$w^{48}_{15} = w^{48}_{14} = 0.055802$	2	3	1	3
#52	$w^{52}_{15} = w^{52}_{14} = 0.034839$	2	3	3	1
#54	$w^{54}_{15} = w^{54}_{14} = 1.052632$	2	3	3	3
#55	$w^{55}_{15} = w^{55}_{14} = 2.693051$	3	1	1	1
#57	$w^{57}_{15} = w^{57}_{14} = 5.201108$	3	1	1	3
#61	$w^{61}_{15} = w^{61}_{14} = 5.843606$	3	1	3	1
#63	$w^{63}_{15} = w^{63}_{14} = 6.742265$	3	1	3	3
#73	$w^{73}_{15} = w^{73}_{14} = 7.133377$	3	3	1	1
#75	$w^{75}_{15} = w^{75}_{14} = 15.261890$	3	3	1	3
#79	$w^{79}_{15} = w^{79}_{14} = 8.440961$	3	3	3	1
#81	$w^{81}_{15} = w^{81}_{14} = 57.894737$	3	3	3	3
	460.000000				

Stage 16:

Proportional completion is applied to voting pattern #22 with $\mathfrak{N}(22) = 1$.

Voters with voting pattern #22 are indifferent between the candidates of the set $\{d,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{d,h\}$, rank these candidates. We get:

	d
$w_{15}^{1} + w_{15}^{3} + w_{15}^{19} + w_{15}^{21} + w_{15}^{28} + w_{15}^{30} + w_{15}^{46} + w_{15}^{48} + w_{15}^{55} + w_{15}^{57} + w_{15}^{73} + w_{15}^{75} = 263.849031$	1
$w_{15}^{7} + w_{15}^{9} + w_{15}^{25} + w_{15}^{27} + w_{15}^{34} + w_{15}^{36} + w_{15}^{52} + w_{15}^{54} + w_{15}^{61} + w_{15}^{63} + w_{15}^{79} + w_{15}^{81} = 194.962338$	3
$W_{15}(\{d,h\}) = 458.811370$	

As voters with voting pattern #22 strictly prefer candidate a and candidate i to candidate h and strictly prefer candidate h to candidate c and as there are $w_{15}^{22} = 1.188630$ voters with voting pattern #22, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{15}^{1} + w_{15}^{3} + w_{15}^{19} + w_{15}^{21} + w_{15}^{28} + w_{15}^{30} + w_{15}^{46} + w_{15}^{48} + w_{15}^{55} + w_{15}^{57} + w_{15}^{73} + w_{15}^{75}) \cdot w_{15}^{22} / W_{15}(\{d,h\}) = 0.683546$	1	3	1	1
$(w_{15}^{7} + w_{15}^{9} + w_{15}^{25} + w_{15}^{27} + w_{15}^{34} + w_{15}^{36} + w_{15}^{52} + w_{15}^{54} + w_{15}^{61} + w_{15}^{63} + w_{15}^{79} + w_{15}^{81}) \cdot w_{15}^{22} / W_{15}(\{d,h\}) = 0.505084$	1	3	3	1
1.188630				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{16} = w^{1}_{15} = 112.296665$	1	1	1	1
#3	$w^{3}_{16} = w^{3}_{15} = 53.951847$	1	1	1	3
#7	$w^{7}_{16} = w^{7}_{15} = 22.188325$	1	1	3	1
#9	$w^{9}_{16} = w^{9}_{15} = 27.021547$	1	1	3	3
#19	$w^{19}_{16} = w^{19}_{15} + 0.683546 = 29.860830$	1	3	1	1
#21	$w^{21}_{16} = w^{21}_{15} = 33.284498$	1	3	1	3
#25	$w^{25}_{16} = w^{25}_{15} + 0.505084 = 16.591422$	1	3	3	1
#27	$w^{27}_{16} = w^{27}_{15} = 49.617108$	1	3	3	3
#28	$w^{28}_{16} = w^{28}_{15} = 4.752354$	2	1	1	1
#30	$w^{30}_{16} = w^{30}_{15} = 0.016914$	2	1	1	3
#34	$w^{34}_{16} = w^{34}_{15} = 0.015329$	2	1	3	1
#36	$w^{36}_{16} = w^{36}_{15} = 0.024652$	2	1	3	3
#46	$w^{46}_{16} = w^{46}_{15} = 0.024240$	2	3	1	1
#48	$w^{48}_{16} = w^{48}_{15} = 0.055802$	2	3	1	3
#52	$w^{52}_{16} = w^{52}_{15} = 0.034839$	2	3	3	1
#54	$w^{54}_{16} = w^{54}_{15} = 1.052632$	2	3	3	3
#55	$w^{55}_{16} = w^{55}_{15} = 2.693051$	3	1	1	1
#57	$w^{57}_{16} = w^{57}_{15} = 5.201108$	3	1	1	3
#61	$w^{61}_{16} = w^{61}_{15} = 5.843606$	3	1	3	1
#63	$w^{63}_{16} = w^{63}_{15} = 6.742265$	3	1	3	3
#73	$w^{73}_{16} = w^{73}_{15} = 7.133377$	3	3	1	1
#75	$w^{75}_{16} = w^{75}_{15} = 15.261890$	3	3	1	3
#79	$w^{79}_{16} = w^{79}_{15} = 8.440961$	3	3	3	1
#81	$w^{81}_{16} = w^{81}_{15} = 57.894737$	3	3	3	3
	460.000000				

Stage 17:

Proportional completion is applied to voting pattern #28 with $\mathfrak{N}(28) = 1$.

Voters with voting pattern #28 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{16}^{1} + w_{16}^{3} + w_{16}^{7} + w_{16}^{9} + w_{16}^{19} + w_{16}^{21} + w_{16}^{25} + w_{16}^{27} = 344.812243$	1
$w_{16}^{55} + w_{16}^{57} + w_{16}^{61} + w_{16}^{63} + w_{16}^{73} + w_{16}^{75} + w_{16}^{79} + w_{16}^{81} = 109.210995$	3
$W_{16}(\{a,h\}) = 454.023238$	

As voters with voting pattern #28 strictly prefer candidate c, candidate d, and candidate i to candidate h and as there are $w_{16}^{28} = 4.752354$ voters with voting pattern #28, these voters have to be replaced by voters with the following voting patterns:

	a	c	d	i
$(w_{16}^{1} + w_{16}^{3} + w_{16}^{7} + w_{16}^{9} + w_{16}^{19} + w_{16}^{21} + w_{16}^{25} + w_{16}^{27}) \cdot w_{16}^{28} / W_{16}(\{a,h\}) = 3.609220$	1	1	1	1
$(w_{16}^{55} + w_{16}^{57} + w_{16}^{61} + w_{16}^{63} + w_{16}^{73} + w_{16}^{75} + w_{16}^{79} + w_{16}^{81}) \cdot w_{16}^{28} / W_{16}(\{a,h\}) = 1.143134$	3	1	1	1
4.752354				

Therefore, we get:

voting pattern		a	c	d	i
#1	$w^{1}_{17} = w^{1}_{16} + 3.609220 = 115.905886$	1	1	1	1
#3	$w^{3}_{17} = w^{3}_{16} = 53.951847$	1	1	1	3
#7	$w^{7}_{17} = w^{7}_{16} = 22.188325$	1	1	3	1
#9	$w^{9}_{17} = w^{9}_{16} = 27.021547$	1	1	3	3
#19	$w^{19}_{17} = w^{19}_{16} = 29.860830$	1	3	1	1
#21	$w^{21}_{17} = w^{21}_{16} = 33.284498$	1	3	1	3
#25	$w^{25}_{17} = w^{25}_{16} = 16.591422$	1	3	3	1
#27	$w^{27}_{17} = w^{27}_{16} = 49.617108$	1	3	3	3
#30	$w^{30}_{17} = w^{30}_{16} = 0.016914$	2	1	1	3
#34	$w^{34}_{17} = w^{34}_{16} = 0.015329$	2	1	3	1
#36	$w^{36}_{17} = w^{36}_{16} = 0.024652$	2	1	3	3
#46	$w^{46}_{17} = w^{46}_{16} = 0.024240$	2	3	1	1
#48	$w^{48}_{17} = w^{48}_{16} = 0.055802$	2	3	1	3
#52	$w^{52}_{17} = w^{52}_{16} = 0.034839$	2	3	3	1
#54	$w^{54}_{17} = w^{54}_{16} = 1.052632$	2	3	3	3
#55	$w^{55}_{17} = w^{55}_{16} + 1.143134 = 3.836185$	3	1	1	1
#57	$w^{57}_{17} = w^{57}_{16} = 5.201108$	3	1	1	3
#61	$w^{61}_{17} = w^{61}_{16} = 5.843606$	3	1	3	1
#63	$w^{63}_{17} = w^{63}_{16} = 6.742265$	3	1	3	3
#73	$w^{73}_{17} = w^{73}_{16} = 7.133377$	3	3	1	1
#75	$w^{75}_{17} = w^{75}_{16} = 15.261890$	3	3	1	3
#79	$w^{79}_{17} = w^{79}_{16} = 8.440961$	3	3	3	1
#81	$w^{81}_{17} = w^{81}_{16} = 57.894737$	3	3	3	3
	460.000000				

Stage 18:

Proportional completion is applied to voting pattern #30 with $\mathfrak{N}(30) = 1$.

Voters with voting pattern #30 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{17}^{1} + w_{17}^{3} + w_{17}^{7} + w_{17}^{9} + w_{17}^{19} + w_{17}^{21} + w_{17}^{25} + w_{17}^{27} = 348.421463$	1
$w_{17}^{55} + w_{17}^{57} + w_{17}^{61} + w_{17}^{63} + w_{17}^{73} + w_{17}^{75} + w_{17}^{79} + w_{17}^{81} = 110.354129$	3
$W_{17}(\{a,h\}) = 458.775592$	

As voters with voting pattern #30 strictly prefer candidate *c* and candidate *d* to candidate *h* and strictly prefer candidate *h* to candidate *i* and as there are $w_{17}^{30} = 0.016914$ voters with voting pattern #30, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{17}^{1} + w_{17}^{3} + w_{17}^{7} + w_{17}^{9} + w_{17}^{19} + w_{17}^{21} + w_{17}^{25} + w_{17}^{27}) \cdot w_{17}^{30} / W_{17}(\{a,h\}) = 0.012845$	1	1	1	3
$(w_{17}^{55} + w_{17}^{57} + w_{17}^{61} + w_{17}^{63} + w_{17}^{73} + w_{17}^{75} + w_{17}^{79} + w_{17}^{81}) \cdot w_{17}^{30} / W_{17}(\{a,h\}) = 0.004069$	3	1	1	3
0.016914				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_{18}^{1} = w_{17}^{1} = 115.905886$	1	1	1	1
#3	$w_{18}^{3} = w_{17}^{3} + 0.012845 = 53.964692$	1	1	1	3
#7	$w_{18}^{7} = w_{17}^{7} = 22.188325$	1	1	3	1
#9	$w_{18}^{9} = w_{17}^{9} = 27.021547$	1	1	3	3
#19	$w_{18}^{19} = w_{17}^{19} = 29.860830$	1	3	1	1
#21	$w_{18}^{21} = w_{17}^{21} = 33.284498$	1	3	1	3
#25	$w_{18}^{25} = w_{17}^{25} = 16.591422$	1	3	3	1
#27	$w_{18}^{27} = w_{17}^{27} = 49.617108$	1	3	3	3
#34	$w_{18}^{34} = w_{17}^{34} = 0.015329$	2	1	3	1
#36	$w_{18}^{36} = w_{17}^{36} = 0.024652$	2	1	3	3
#46	$w_{18}^{46} = w_{17}^{46} = 0.024240$	2	3	1	1
#48	$w_{18}^{48} = w_{17}^{48} = 0.055802$	2	3	1	3
#52	$w_{18}^{52} = w_{17}^{52} = 0.034839$	2	3	3	1
#54	$w_{18}^{54} = w_{17}^{54} = 1.052632$	2	3	3	3
#55	$w_{18}^{55} = w_{17}^{55} = 3.836185$	3	1	1	1
#57	$w_{18}^{57} = w_{17}^{57} + 0.004069 = 5.205177$	3	1	1	3
#61	$w_{18}^{61} = w_{17}^{61} = 5.843606$	3	1	3	1
#63	$w_{18}^{63} = w_{17}^{63} = 6.742265$	3	1	3	3
#73	$w_{18}^{73} = w_{17}^{73} = 7.133377$	3	3	1	1
#75	$w_{18}^{75} = w_{17}^{75} = 15.261890$	3	3	1	3
#79	$w_{18}^{79} = w_{17}^{79} = 8.440961$	3	3	3	1
#81	$w_{18}^{81} = w_{17}^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 19:

Proportional completion is applied to voting pattern #34 with $\mathfrak{N}(34) = 1$.

Voters with voting pattern #34 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{18}^{1} + w_{18}^{3} + w_{18}^{7} + w_{18}^{9} + w_{18}^{19} + w_{18}^{21} + w_{18}^{25} + w_{18}^{27} = 348.434309$	1
$w_{18}^{55} + w_{18}^{57} + w_{18}^{61} + w_{18}^{63} + w_{18}^{73} + w_{18}^{75} + w_{18}^{79} + w_{18}^{81} = 110.358198$	3
$W_{18}(\{a,h\}) = 458.792507$	

As voters with voting pattern #34 strictly prefer candidate *c* and candidate *i* to candidate *h* and strictly prefer candidate *h* to candidate *d* and as there are $w_{18}^{34} = 0.015329$ voters with voting pattern #34, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{18}^{1} + w_{18}^{3} + w_{18}^{7} + w_{18}^{9} + w_{18}^{19} + w_{18}^{21} + w_{18}^{25} + w_{18}^{27}) \cdot w_{18}^{34} / W_{18}(\{a,h\}) = 0.011642$	1	1	3	1
$(w_{18}^{55} + w_{18}^{57} + w_{18}^{61} + w_{18}^{63} + w_{18}^{73} + w_{18}^{75} + w_{18}^{79} + w_{18}^{81}) \cdot w_{18}^{34} / W_{18}(\{a,h\}) = 0.003687$	3	1	3	1
0.015329				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{19} = w^{1}_{18} = 115.905886$	1	1	1	1
#3	$w^{3}_{19} = w^{3}_{18} = 53.964692$	1	1	1	3
#7	$w^{7}_{19} = w^{7}_{18} + 0.011642 = 22.199966$	1	1	3	1
#9	$w^{9}_{19} = w^{9}_{18} = 27.021547$	1	1	3	3
#19	$w^{19}_{19} = w^{19}_{18} = 29.860830$	1	3	1	1
#21	$w^{21}_{19} = w^{21}_{18} = 33.284498$	1	3	1	3
#25	$w^{25}_{19} = w^{25}_{18} = 16.591422$	1	3	3	1
#27	$w^{27}_{19} = w^{27}_{18} = 49.617108$	1	3	3	3
#36	$w^{36}_{19} = w^{36}_{18} = 0.024652$	2	1	3	3
#46	$w^{46}_{19} = w^{46}_{18} = 0.024240$	2	3	1	1
#48	$w^{48}_{19} = w^{48}_{18} = 0.055802$	2	3	1	3
#52	$w^{52}_{19} = w^{52}_{18} = 0.034839$	2	3	3	1
#54	$w^{54}_{19} = w^{54}_{18} = 1.052632$	2	3	3	3
#55	$w^{55}_{19} = w^{55}_{18} = 3.836185$	3	1	1	1
#57	$w^{57}_{19} = w^{57}_{18} = 5.205177$	3	1	1	3
#61	$w^{61}_{19} = w^{61}_{18} + 0.003687 = 5.847293$	3	1	3	1
#63	$w^{63}_{19} = w^{63}_{18} = 6.742265$	3	1	3	3
#73	$w^{73}_{19} = w^{73}_{18} = 7.133377$	3	3	1	1
#75	$w^{75}_{19} = w^{75}_{18} = 15.261890$	3	3	1	3
#79	$w^{79}_{19} = w^{79}_{18} = 8.440961$	3	3	3	1
#81	$w^{81}_{19} = w^{81}_{18} = 57.894737$	3	3	3	3
	460.000000				

Stage 20:

Proportional completion is applied to voting pattern #36 with $\mathfrak{N}(36) = 1$.

Voters with voting pattern #36 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{19}^{1} + w_{19}^{3} + w_{19}^{7} + w_{19}^{9} + w_{19}^{19} + w_{19}^{21} + w_{19}^{25} + w_{19}^{27} = 348.445951$	1
$w_{19}^{55} + w_{19}^{57} + w_{19}^{61} + w_{19}^{63} + w_{19}^{73} + w_{19}^{75} + w_{19}^{79} + w_{19}^{81} = 110.361885$	3
$W_{19}(\{a,h\}) = 458.807836$	

As voters with voting pattern #36 strictly prefer candidate *c* to candidate *h* and strictly prefer candidate *h* to candidate *d* and candidate *i* and as there are $w_{19}^{36} = 0.024652$ voters with voting pattern #36, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{19}^{1} + w_{19}^{3} + w_{19}^{7} + w_{19}^{9} + w_{19}^{19} + w_{19}^{21} + w_{19}^{25} + w_{19}^{27}) \cdot w_{19}^{36} / W_{19}(\{a,h\}) = 0.018722$	1	1	3	3
$(w_{19}^{55} + w_{19}^{57} + w_{19}^{61} + w_{19}^{63} + w_{19}^{73} + w_{19}^{75} + w_{19}^{79} + w_{19}^{81}) \cdot w_{19}^{36} / W_{19}(\{a,h\}) = 0.005930$	3	1	3	3
0.024652				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{20} = w^{1}_{19} = 115.905886$	1	1	1	1
#3	$w^{3}_{20} = w^{3}_{19} = 53.964692$	1	1	1	3
#7	$w^{7}_{20} = w^{7}_{19} = 22.199966$	1	1	3	1
#9	$w^{9}_{20} = w^{9}_{19} + 0.018722 = 27.040269$	1	1	3	3
#19	$w^{19}_{20} = w^{19}_{19} = 29.860830$	1	3	1	1
#21	$w^{21}_{20} = w^{21}_{19} = 33.284498$	1	3	1	3
#25	$w^{25}_{20} = w^{25}_{19} = 16.591422$	1	3	3	1
#27	$w^{27}_{20} = w^{27}_{19} = 49.617108$	1	3	3	3
#46	$w^{46}_{20} = w^{46}_{19} = 0.024240$	2	3	1	1
#48	$w^{48}_{20} = w^{48}_{19} = 0.055802$	2	3	1	3
#52	$w^{52}_{20} = w^{52}_{19} = 0.034839$	2	3	3	1
#54	$w^{54}_{20} = w^{54}_{19} = 1.052632$	2	3	3	3
#55	$w^{55}_{20} = w^{55}_{19} = 3.836185$	3	1	1	1
#57	$w^{57}_{20} = w^{57}_{19} = 5.205177$	3	1	1	3
#61	$w^{61}_{20} = w^{61}_{19} = 5.847293$	3	1	3	1
#63	$w^{63}_{20} = w^{63}_{19} + 0.005930 = 6.748195$	3	1	3	3
#73	$w^{73}_{20} = w^{73}_{19} = 7.133377$	3	3	1	1
#75	$w^{75}_{20} = w^{75}_{19} = 15.261890$	3	3	1	3
#79	$w^{79}_{20} = w^{79}_{19} = 8.440961$	3	3	3	1
#81	$w^{81}_{20} = w^{81}_{19} = 57.894737$	3	3	3	3
	460.000000				

Stage 21:

Proportional completion is applied to voting pattern #46 with $\mathfrak{N}(46) = 1$.

Voters with voting pattern #46 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{20}^{1} + w_{20}^{3} + w_{20}^{7} + w_{20}^{9} + w_{20}^{19} + w_{20}^{21} + w_{20}^{25} + w_{20}^{27} = 348.464673$	1
$w_{20}^{55} + w_{20}^{57} + w_{20}^{61} + w_{20}^{63} + w_{20}^{73} + w_{20}^{75} + w_{20}^{79} + w_{20}^{81} = 110.367815$	3
$W_{20}(\{a,h\}) = 458.832487$	

As voters with voting pattern #46 strictly prefer candidate *d* and candidate *i* to candidate *h* and strictly prefer candidate *h* to candidate *c* and as there are $w_{20}^{46} = 0.024240$ voters with voting pattern #46, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{20}^{1} + w_{20}^{3} + w_{20}^{7} + w_{20}^{9} + w_{20}^{19} + w_{20}^{21} + w_{20}^{25} + w_{20}^{27}) \cdot w_{20}^{46} / W_{20}(\{a,h\}) = 0.018409$	1	3	1	1
$(w_{20}^{55} + w_{20}^{57} + w_{20}^{61} + w_{20}^{63} + w_{20}^{73} + w_{20}^{75} + w_{20}^{79} + w_{20}^{81}) \cdot w_{20}^{46} / W_{20}(\{a,h\}) = 0.005831$	3	3	1	1
0.024240				

Therefore, we get:

voting pattern		a	c	d	i
#1	$w_{21}^{1} = w_{20}^{1} = 115.905886$	1	1	1	1
#3	$w_{21}^{3} = w_{20}^{3} = 53.964692$	1	1	1	3
#7	$w_{21}^{7} = w_{20}^{7} = 22.199966$	1	1	3	1
#9	$w_{21}^{9} = w_{20}^{9} = 27.040269$	1	1	3	3
#19	$w_{21}^{19} = w_{20}^{19} + 0.018409 = 29.879240$	1	3	1	1
#21	$w_{21}^{21} = w_{20}^{21} = 33.284498$	1	3	1	3
#25	$w_{21}^{25} = w_{20}^{25} = 16.591422$	1	3	3	1
#27	$w_{21}^{27} = w_{20}^{27} = 49.617108$	1	3	3	3
#48	$w_{21}^{48} = w_{20}^{48} = 0.055802$	2	3	1	3
#52	$w_{21}^{52} = w_{20}^{52} = 0.034839$	2	3	3	1
#54	$w_{21}^{54} = w_{20}^{54} = 1.052632$	2	3	3	3
#55	$w_{21}^{55} = w_{20}^{55} = 3.836185$	3	1	1	1
#57	$w_{21}^{57} = w_{20}^{57} = 5.205177$	3	1	1	3
#61	$w_{21}^{61} = w_{20}^{61} = 5.847293$	3	1	3	1
#63	$w_{21}^{63} = w_{20}^{63} = 6.748195$	3	1	3	3
#73	$w_{21}^{73} = w_{20}^{73} + 0.005831 = 7.139208$	3	3	1	1
#75	$w_{21}^{75} = w_{20}^{75} = 15.261890$	3	3	1	3
#79	$w_{21}^{79} = w_{20}^{79} = 8.440961$	3	3	3	1
#81	$w_{21}^{81} = w_{20}^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 22:

Proportional completion is applied to voting pattern #48 with $\mathfrak{N}(48) = 1$.

Voters with voting pattern #48 are indifferent between the candidates of the set $\{a,h\}$. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set $\{a,h\}$, rank these candidates. We get:

	a
$w_{21}^{1} + w_{21}^{3} + w_{21}^{7} + w_{21}^{9} + w_{21}^{19} + w_{21}^{21} + w_{21}^{25} + w_{21}^{27} = 348.483082$	1
$w_{21}^{55} + w_{21}^{57} + w_{21}^{61} + w_{21}^{63} + w_{21}^{73} + w_{21}^{75} + w_{21}^{79} + w_{21}^{81} = 110.373645$	3
$W_{21}(\{a,h\}) = 458.856727$	

As voters with voting pattern #48 strictly prefer candidate *d* to candidate *h* and strictly prefer candidate *h* to candidate *c* and candidate *i* and as there are w_{21}^{48} = 0.055802 voters with voting pattern #48, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{21}^{1} + w_{21}^{3} + w_{21}^{7} + w_{21}^{9} + w_{21}^{19} + w_{21}^{21} + w_{21}^{25} + w_{21}^{27}) \cdot w_{21}^{48} / W_{21}(\{a,h\}) = 0.042379$	1	3	1	3
$(w_{21}^{55} + w_{21}^{57} + w_{21}^{61} + w_{21}^{63} + w_{21}^{73} + w_{21}^{75} + w_{21}^{79} + w_{21}^{81}) \cdot w_{21}^{48} / W_{21}(\{a,h\}) = 0.013423$	3	3	1	3
0.055802				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_{22}^{1} = w_{21}^{1} = 115.905886$	1	1	1	1
#3	$w_{22}^{3} = w_{21}^{3} = 53.964692$	1	1	1	3
#7	$w_{22}^{7} = w_{21}^{7} = 22.199966$	1	1	3	1
#9	$w_{22}^{9} = w_{21}^{9} = 27.040269$	1	1	3	3
#19	$w_{22}^{19} = w_{21}^{19} = 29.879240$	1	3	1	1
#21	$w_{22}^{21} = w_{21}^{21} + 0.042379 = 33.326877$	1	3	1	3
#25	$w_{22}^{25} = w_{21}^{25} = 16.591422$	1	3	3	1
#27	$w_{22}^{27} = w_{21}^{27} = 49.617108$	1	3	3	3
#52	$w_{22}^{52} = w_{21}^{52} = 0.034839$	2	3	3	1
#54	$w_{22}^{54} = w_{21}^{54} = 1.052632$	2	3	3	3
#55	$w_{22}^{55} = w_{21}^{55} = 3.836185$	3	1	1	1
#57	$w_{22}^{57} = w_{21}^{57} = 5.205177$	3	1	1	3
#61	$w_{22}^{61} = w_{21}^{61} = 5.847293$	3	1	3	1
#63	$w_{22}^{63} = w_{21}^{63} = 6.748195$	3	1	3	3
#73	$w_{22}^{73} = w_{21}^{73} = 7.139208$	3	3	1	1
#75	$w_{22}^{75} = w_{21}^{75} + 0.013423 = 15.275312$	3	3	1	3
#79	$w_{22}^{79} = w_{21}^{79} = 8.440961$	3	3	3	1
#81	$w_{22}^{81} = w_{21}^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 23:

Proportional completion is applied to voting pattern #52 with $\mathfrak{N}(52) = 1$.

Voters with voting pattern #52 are indifferent between the candidates of the set {*a*,*h*}. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set {*a*,*h*}, rank these candidates. We get:

	a
$w_{22}^{1} + w_{22}^{3} + w_{22}^{7} + w_{22}^{9} + w_{22}^{19} + w_{22}^{21} + w_{22}^{25} + w_{22}^{27} = 348.525462$	1
$w_{22}^{55} + w_{22}^{57} + w_{22}^{61} + w_{22}^{63} + w_{22}^{73} + w_{22}^{75} + w_{22}^{79} + w_{22}^{81} = 110.387068$	3
$W_{22}(\{a,h\}) = 458.912530$	

As voters with voting pattern #52 strictly prefer candidate *i* to candidate *h* and strictly prefer candidate *h* to candidate *c* and candidate *d* and as there are w_{22}^{52} = 0.034839 voters with voting pattern #52, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w_{22}^{1} + w_{22}^{3} + w_{22}^{7} + w_{22}^{9} + w_{22}^{19} + w_{22}^{21} + w_{22}^{25} + w_{22}^{27}) \cdot w_{22}^{52} / W_{22}(\{a,h\}) = 0.026459$	1	3	3	1
$(w_{22}^{55} + w_{22}^{57} + w_{22}^{61} + w_{22}^{63} + w_{22}^{73} + w_{22}^{75} + w_{22}^{79} + w_{22}^{81}) \cdot w_{22}^{52} / W_{22}(\{a,h\}) = 0.008380$	3	3	3	1
0.034839				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w_{23}^{1} = w_{22}^{1} = 115.905886$	1	1	1	1
#3	$w_{23}^{3} = w_{22}^{3} = 53.964692$	1	1	1	3
#7	$w_{23}^{7} = w_{22}^{7} = 22.199966$	1	1	3	1
#9	$w_{23}^{9} = w_{22}^{9} = 27.040269$	1	1	3	3
#19	$w_{23}^{19} = w_{22}^{19} = 29.879240$	1	3	1	1
#21	$w_{23}^{21} = w_{22}^{21} = 33.326877$	1	3	1	3
#25	$w_{23}^{25} = w_{22}^{25} + 0.026459 = 16.617881$	1	3	3	1
#27	$w_{23}^{27} = w_{22}^{27} = 49.617108$	1	3	3	3
#54	$w_{23}^{54} = w_{22}^{54} = 1.052632$	2	3	3	3
#55	$w_{23}^{55} = w_{22}^{55} = 3.836185$	3	1	1	1
#57	$w_{23}^{57} = w_{22}^{57} = 5.205177$	3	1	1	3
#61	$w_{23}^{61} = w_{22}^{61} = 5.847293$	3	1	3	1
#63	$w_{23}^{63} = w_{22}^{63} = 6.748195$	3	1	3	3
#73	$w_{23}^{73} = w_{22}^{73} = 7.139208$	3	3	1	1
#75	$w_{23}^{75} = w_{22}^{75} = 15.275312$	3	3	1	3
#79	$w_{23}^{79} = w_{22}^{79} + 0.008380 = 8.449341$	3	3	3	1
#81	$w_{23}^{81} = w_{22}^{81} = 57.894737$	3	3	3	3
	460.000000				

Stage 24:

Proportional completion is applied to voting pattern #54 with $\mathfrak{N}(54) = 1$.

Voters with voting pattern #54 are indifferent between the candidates of the set {*a*,*h*}. Therefore, we investigate how those voters, who are not indifferent between all the candidates of the set {*a*,*h*}, rank these candidates. We get:

	a
$w_{23}^{1} + w_{23}^{3} + w_{23}^{7} + w_{23}^{9} + w_{23}^{19} + w_{23}^{21} + w_{23}^{25} + w_{23}^{27} = 348.551920$	1
$w_{23}^{55} + w_{23}^{57} + w_{23}^{61} + w_{23}^{63} + w_{23}^{73} + w_{23}^{75} + w_{23}^{79} + w_{23}^{81} = 110.395448$	3
$W_{23}(\{a,h\}) = 458.947368$	

As voters with voting pattern #54 strictly prefer candidate *h* to candidate *c*, candidate *d*, and candidate *i* and as there are w^{54}_{23} = 1.052632 voters with voting pattern #54, these voters have to be replaced by voters with the following voting patterns:

	a	*c*	*d*	*i*
$(w^{1}_{23} + w^{3}_{23} + w^{7}_{23} + w^{9}_{23} + w^{19}_{23} + w^{21}_{23} + w^{25}_{23} + w^{27}_{23}) \cdot w^{54}_{23} / W_{23}(\{a,h\}) = 0.799431$	1	3	3	3
$(w^{55}_{23} + w^{57}_{23} + w^{61}_{23} + w^{63}_{23} + w^{73}_{23} + w^{75}_{23} + w^{79}_{23} + w^{81}_{23}) \cdot w^{54}_{23} / W_{23}(\{a,h\}) = 0.253201$	3	3	3	3
1.052632				

Therefore, we get:

voting pattern		*a*	*c*	*d*	*i*
#1	$w^{1}_{24} = w^{1}_{23} = 115.905886$	1	1	1	1
#3	$w^{3}_{24} = w^{3}_{23} = 53.964692$	1	1	1	3
#7	$w^{7}_{24} = w^{7}_{23} = 22.199966$	1	1	3	1
#9	$w^{9}_{24} = w^{9}_{23} = 27.040269$	1	1	3	3
#19	$w^{19}_{24} = w^{19}_{23} = 29.879240$	1	3	1	1
#21	$w^{21}_{24} = w^{21}_{23} = 33.326877$	1	3	1	3
#25	$w^{25}_{24} = w^{25}_{23} = 16.617881$	1	3	3	1
#27	$w^{27}_{24} = w^{27}_{23} + 0.799431 = 50.416539$	1	3	3	3
#55	$w^{55}_{24} = w^{55}_{23} = 3.836185$	3	1	1	1
#57	$w^{57}_{24} = w^{57}_{23} = 5.205177$	3	1	1	3
#61	$w^{61}_{24} = w^{61}_{23} = 5.847293$	3	1	3	1
#63	$w^{63}_{24} = w^{63}_{23} = 6.748195$	3	1	3	3
#73	$w^{73}_{24} = w^{73}_{23} = 7.139208$	3	3	1	1
#75	$w^{75}_{24} = w^{75}_{23} = 15.275312$	3	3	1	3
#79	$w^{79}_{24} = w^{79}_{23} = 8.449341$	3	3	3	1
#81	$w^{81}_{24} = w^{81}_{23} + 0.253201 = 58.147937$	3	3	3	3
	460.000000				

The file *a53_prop.dat* contains the voting profiles after proportional completion to calculate the 1260 entries of the file *a53_stv.dat*. In the file *a53_prop.dat*, the above voting profile has the following format:

```
A C D I against H
115.905886 1 1 1 1
53.964692 1 1 1 3
22.199966 1 1 3 1
27.040269 1 1 3 3
29.879240 1 3 1 1
33.326877 1 3 1 3
16.617881 1 3 3 1
50.416539 1 3 3 3
3.836185 3 1 1 1
5.205177 3 1 1 3
5.847293 3 1 3 1
6.748195 3 1 3 3
7.139208 3 3 1 1
15.275312 3 3 1 3
8.449341 3 3 3 1
58.147937 3 3 3 3
```