Aggregation based on the most distant item replacement

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Measuring Disagreements Between Users

- We Try to measure how “far” the recommended item is for each user
- For items that are not in the user’s top K, we say that he disagrees by his own ranking of the item minus K

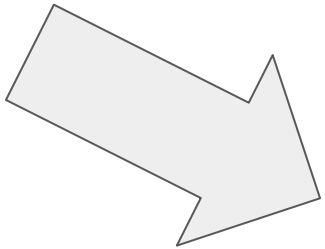
$$\Delta(u, d) = \max\big(0,\ r_u(d) - K\big)$$

$$D(u) = \sum_{d \in GR} \Delta(u, d)$$

$$\text{groupDis} = \sum_{u \in G} D(u)$$

Rankings

USER N	A	B	C	D
1	0,8	0,1	0,4	0,9
2	0,3	0,9	0,1	0,1
3	0,8	0,4	0,4	0,1
4	0,3	0,5	1	0,1



Disagreements (penalties)

USER N	A	B
1	0	2
2	0	0
3	0	0
4	1	0

Selected movies by the AVERAGE aggregation method: **A,B**

Total disagreements = 3

Aggregation Method

Inputs:

- The aggregated list
- rankings for each user
- the “penalties” (distances for each item for each user in the aggregated list

output:
- New aggregated list

Aggregation Algorithm

1. Use aggregation method to get the aggregated rankings for the group
2. compute the disagreements (that we defined earlier)
3. Pick the most disagreeable user
4. remove his most disagreed item from the aggregated rankings
5. Make a set of items (**candidates**) that are ranked higher (in the most disagreeable user's ranking) than the removed item
6. Let other users (based on other aggregation methods) pick the best item out of the **candidates** and add the item to the aggregated list
7. Iterate, stop at some point (Group disagreement is not getting lower)

Disagreements (basic metric defined in the lecture) 0.04913772975712505
Penalties:

movieId	3604	5490	132333	25947	167772	3567	3379	67618	3086	152105
userId										
82	0.0	23.0	24.0	30.0	31.0	13.0	38.0	44.0	52.0	55.0
219	0.0	5.0	6.0	8.0	10.0	2.0	16.0	45.0	48.0	52.0
56	0.0	24.0	25.0	29.0	30.0	4286.0	41.0	52.0	64.0	70.0
599	0.0	40.0	41.0	45.0	46.0	6.0	70.0	86.0	93.0	96.0
265	0.0	15.0	16.0	23.0	24.0	8.0	0	39.0	53.0	57.0

TOTAL GROUP DISAGREEMENTS (ours): 5912.0

The most disaggreed item is 3567
Disagreements (basic metric defined in the lecture) 0.03581813766239
Penalties:

movieId	3604	5490	132333	25947	167772	3379	67618	3086	152105	2314
userId										
82	0.0	23.0	24.0	30.0	31.0	38.0	44.0	52.0	55.0	39.0
219	0.0	5.0	6.0	8.0	10.0	16.0	45.0	48.0	52.0	59.0
56	0.0	24.0	25.0	29.0	30.0	41.0	52.0	64.0	70.0	203.0
599	0.0	40.0	41.0	45.0	46.0	70.0	86.0	93.0	96.0	148.0
265	0.0	15.0	16.0	23.0	24.0	31.0	39.0	53.0	57.0	30.0

TOTAL GROUP DISAGREEMENTS (ours): 2076.0