Results for the NMF algorithm

h	Loss male	Loss female	Group Unfairness	Individual Unfairness
Initial	64.2712	64.0210	0.0157	0.0722
1	72.0672	67.5337	5.1381	0.0632
2	72.0658	67.5371	5.1275	0.0632
3	72.0671	67.5363	5.1320	0.0632
4	72.0665	67.5345	5.1349	0.0632

Table 1: Results for the NMF algorithm with gender-based groups.

h	Loss Children	Loss Teenager	Loss Adult	Loss Elder	Group Unfairness	Individual Unfairness
Initial	23.4828	48.7850	65.6288	44.1351	225.6457	0.0722
1	28.1236	51.1172	72.6020	48.7861	248.0125	0.0632
2	28.1201	51.1296	72.6033	48.7931	248.0669	0.0632
3	28.1367	51.1304	72.6044	48.7902	247.8991	0.0632
4	28.1372	51.1239	72.6047	48.7821	247.8991	0.0632

Table 2: Results for the NMF algorithm with age-based groups.

h	CA	IL	MN	NY	TX	Rest	Group Unfairness	Individual Unfairness
Initial	67.4483	59.8881	61.5345	87.1139	59.5295	62.3443	93.3078	0.0722
1	76.0772	66.2453	70.4980	87.8519	69.1499	70.2629	50.5872	0.0645
2	76.0784	66.2428	70.4963	87.8608	69.1494	70.2631	50.6394	0.0645
3	76.0770	66.2483	70.4939	87.8537	69.1565	70.2665	50.5797	0.0645
4	76.0782	66.2554	70.5035	87.8594	69.1504	70.2642	50.5935	0.0645

Table 3: Results for the NMF algorithm with states-based groups.

h	Blockbuster	Diversed	Niched	Group Unfairness	Individual Unfairness
Initial	20.6032	49.1364	122.6704	1848.7868	0.0722
1	28.7353	58.6936	125.1649	1623.8459	0.0654
2	28.7356	58.6934	125.1721	1624.0976	0.0654
3	28.7383	58.6971	125.1708	1623.9451	0.0654
4	28.7363	58.6937	125.1627	1623.7357	0.0654

Table 4: Results for the NMF algorithm with popularity-based groups.