

Transparent Movie Recommendation System
 Weekly Report
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Code changes this week:

- Actor appearance added to movie features, minor model performance increase ($\sim .03$).
- Added number of ratings to movie features, minor model performance decrease ($\sim .02$).
- Method which given a user records movie IDs, average rating, user's error from average, user rating, model prediction and model error to a csv file.
- Method which given a user and movie records nonzero features and weights to a csv file.

Some user result tables and movie features/weights.

User 86

Average Rating	3.52
Number of Ratings	24
Model MAE	0.08

Movie ID	Average Rating	Error from Avg	User Rating	Model Prediction	Model Error
300	3.6311	0.6311	3.0000	2.9975	0.0025
288	3.4414	0.4414	3.0000	3.0043	0.0043
304	3.5369	0.5369	3.0000	3.0056	0.0056
259	2.6852	1.3148	4.0000	3.9930	0.0070
327	3.3771	0.6229	4.0000	3.9893	0.0107
881	2.9333	0.9333	2.0000	2.0115	0.0115
269	3.9270	0.0730	4.0000	3.9854	0.0146
326	3.3600	0.3600	3.0000	3.0158	0.0158
888	3.4667	0.5333	4.0000	3.9768	0.0232
270	3.5956	1.4044	5.0000	4.9768	0.0232
683	2.4082	2.5918	5.0000	4.9736	0.0264
258	3.8035	1.1965	5.0000	4.9599	0.0401
889	3.3846	1.6154	5.0000	4.9465	0.0535
286	3.6570	0.6570	3.0000	3.0579	0.0579
289	2.9807	0.0193	3.0000	3.0624	0.0624
319	3.2738	0.2738	3.0000	3.0671	0.0671
1176	3.3636	1.6364	5.0000	4.9319	0.0681
328	3.4237	1.4237	2.0000	2.0866	0.0866
242	3.9915	0.0085	4.0000	4.1381	0.1381
338	2.6593	1.6593	1.0000	1.1532	0.1532
879	3.2721	1.2721	2.0000	2.1808	0.1808
872	3.0952	0.0952	3.0000	3.1872	0.1872
1175	3.4000	1.6000	5.0000	4.2990	0.7010
Average:	3.3334	0.9087	3.5217	3.5217	0.0844

Movie 86 Features/Weights
 Top 10 positive/negative features
 Model error: 0.0025

Feature	Weights
bar	0.0496
homosexual	0.0272
kiss	0.0264
teacher	0.0075
small-town	0.0073
book	0.0073
gay-slur	-0.0031
television	-0.0043
Action	-0.0056
watching-tv	-0.0056
gay	-0.0115
Kline, Kevin (I)	-0.0158
kissing	-0.0495
Average Rating	-0.0535
high-school	-0.0579
priest	-0.0624
father-son-relationship	-0.0759
Thriller	-0.1863
reporter	-0.2166
bicycle	-0.2295

Total nonzero features: 20

Movie 1175 Features/Weights
 Model error: 0.7

Feature	Weights
Romance	0.0634
Average Rating	-0.0120

Total nonzero features: 2

User 849

Average Rating	4.869
Number of Ratings	23
Model MAE	0.09

	Movie ID	Average Rating	Error from Avg	User Rating	Model Prediction	Model Error
Movie 174	174	4.2524	0.7476	5.0000	5.0019	0.0019
	133	3.8713	1.1287	5.0000	4.9957	0.0043
	588	3.7921	1.2079	5.0000	4.9749	0.0251
	172	4.2044	0.7956	5.0000	4.9669	0.0331
	234	3.7750	1.2250	5.0000	4.9652	0.0348
	197	4.1046	0.8954	5.0000	4.9585	0.0415
	298	3.7680	1.2320	5.0000	4.9584	0.0416
	143	3.7658	1.2342	5.0000	4.9529	0.0471
	288	3.4414	1.5586	5.0000	4.9519	0.0481
	27	3.1053	1.8947	5.0000	4.9507	0.0493
	207	3.8182	1.1818	5.0000	4.9496	0.0504
	15	3.7782	1.2218	5.0000	4.9477	0.0523
	38	3.0083	1.9917	5.0000	4.9397	0.0603
	633	4.0580	0.9420	5.0000	4.9392	0.0608
	118	3.2150	1.7850	5.0000	4.9275	0.0725
	121	3.4382	1.5618	5.0000	4.9243	0.0757
	676	3.3377	1.6623	5.0000	4.9091	0.0909
	421	3.5943	1.4057	5.0000	4.9082	0.0918
	625	3.3293	1.6707	5.0000	4.9072	0.0928
	928	3.1154	1.8846	5.0000	4.9001	0.0999
	568	3.6478	0.3522	4.0000	4.2477	0.2477
	427	4.2922	0.2922	4.0000	4.3978	0.3978
	406	2.4490	1.5510	4.0000	4.4251	0.4251
	Average:	3.6157	1.2792	4.8696	4.8696	0.0933

Features/Weights

Model error: 0.0019

Feature	Weights
lifting-someone-into-the-air	0.0195
kiss	0.0132
chase	0.0129
kidnapping	0.0091
mirror	0.0085
Adventure	0.0079
Action	0.0069
one-man-army	0.0065
gore	0.0064
shot-in-the-head	0.0051
fire	-0.0037
sword	-0.0090
disguise	-0.0121
revolver	-0.0165
murder	-0.0165
religion	-0.0233
bar	-0.0239
falling-from-height	-0.0281
famous-score	-0.0414
horse	-0.0417

Number of nonzero features: 43

Movie 406 Features/Weights

Model error 0.4251

Feature	Weights
shot-in-the-forehead	0.0152
kiss	0.0132
hotel	0.0095
sex	0.0090
violence	0.0077
Thriller	0.0075
gun	0.0066
martial-arts	0.0059
Horror	0.0048
cult-film	0.0040
femme-fatale	0.0032
scientist	0.0032
1990s	0.0003
flashback	0.0003
Average Rating	-0.0089
sword	-0.0090
helicopter	-0.0233

Number of nonzero features: 16

User 229

Average Rating	2.73
Number of Ratings	29
Model MAE	0.63

Movie ID	Average Rating	Error from Avg	User Rating	Model Prediction	Model Error
312	3.1625	0.1625	3.0000	2.9350	0.0650
272	4.2626	1.2626	3.0000	2.8997	0.1003
750	3.8548	1.8548	2.0000	2.1416	0.1416
258	3.8035	1.8035	2.0000	2.1817	0.1817
288	3.4414	0.5586	4.0000	3.8112	0.1888
882	3.2941	0.7059	4.0000	3.7647	0.2353
751	3.4278	0.4278	3.0000	2.7601	0.2399
269	3.9270	0.0730	4.0000	3.7210	0.2790
748	3.1234	0.1234	3.0000	2.6968	0.3032
245	3.1083	0.1083	3.0000	2.6463	0.3537
300	3.6311	1.6311	2.0000	2.3567	0.3567
937	3.4054	1.4054	2.0000	2.4198	0.4198
358	2.6154	1.6154	1.0000	1.4232	0.4232
303	3.6866	2.6866	1.0000	2.0433	1.0433
311	3.6800	1.3200	5.0000	3.8584	1.1416
896	3.7727	0.2273	4.0000	2.6429	1.3571
347	3.5109	2.5109	1.0000	2.4607	1.4607
315	4.1000	3.1000	1.0000	2.7430	1.7430
302	4.1616	0.8384	5.0000	3.0993	1.9007
Average:	3.5082	1.3547	2.7333	2.7333	0.6286

Movie 312 Features/Weights
 Top 10 positive/negative features
 Model error: 0.06

Feature	Weights
famous-score	0.1507
Comedy	0.1310
electrocution	0.0959
car	0.0771
escape	0.0761
knife	0.0739
ship	0.0692
suicide-attempt	0.0566
revolver	0.0540
hero	0.0523
theft	-0.0397
suicide	-0.0397
photograph	-0.0466
cigarette-smoking	-0.0473
lifting-someone-into-the-air	-0.0515
Average Rating	-0.0603
handcuffs	-0.0696
black-comedy	-0.0698
widow	-0.0750
slow-motion-scene	-0.0755

Total nonzero features: 70

Movie 302 Features/Weights
 Top 10 positive/negative features
 Model error: 1.9

Feature	Weights
Average Rating	0.1140
Thriller	0.0559
Film-Noir	0.0126
Mystery	-0.0320

Total nonzero features: 4

User 38

Average Rating	4.07
Number of Ratings	87
Model MAE	0.92

Movie ID	Average Rating	Error from Avg	User Rating	Model Prediction	Model Error
218	3.4561	0.4561	3.0000	3.0050	0.0050
155	3.1020	1.8980	5.0000	4.9848	0.0152
588	3.7921	1.2079	5.0000	4.9726	0.0274
28	3.9312	0.0688	4.0000	3.9354	0.0646
627	3.2267	1.7733	5.0000	4.9162	0.0838
67	3.0485	0.9515	4.0000	3.9137	0.0863
71	3.7818	1.2182	5.0000	5.0867	0.0867
82	3.7203	1.2797	5.0000	4.8971	0.1029
404	3.6733	1.3267	5.0000	4.8549	0.1451
451	3.3471	1.6529	5.0000	4.8366	0.1634
672	2.7231	0.2769	3.0000	3.1640	0.1640
1014	3.0612	1.9388	5.0000	3.4102	1.5898
400	2.7222	1.7222	1.0000	2.6971	1.6971
508	3.5953	1.5953	2.0000	3.7066	1.7066
678	2.8082	2.1918	5.0000	3.2677	1.7323
717	2.8171	1.8171	1.0000	2.8628	1.8628
84	3.0000	2.0000	5.0000	3.1070	1.8930
1034	2.5185	1.5185	1.0000	3.1355	2.1355
940	2.3438	1.3438	1.0000	3.1599	2.1599
403	3.4279	2.4279	1.0000	3.1934	2.1934
211	3.9126	2.9126	1.0000	3.6325	2.6325
432	3.7701	2.7701	1.0000	4.0554	3.0554
Average:	3.1901	1.5144	3.7190	3.7190	0.7415

Movie 218 Features/Weights

Model error: 0.005

Feature	Weights
drugs	0.2029
hallucination	0.1781
police-officer	0.1707
coming-of-age	0.1630
bare-chested-male	0.1167
hitman	0.1089
pay-phone	0.1065
knife	0.1015
teenager	0.0988
airport	0.0982
hospital	-0.0998
bar	-0.1045
husband-wife-relationship	-0.1150
corpse	-0.1420
dysfunctional-family	-0.1453
drunkenness	-0.1538
police	-0.1541
betrayal	-0.1583
Thriller	-0.1773
neo-noir	-0.1856

Number of nonzero features: 94

Movie 432 Features/Weights
Model Error: 3.0554

Number of nonzero features: 4	Feature	Weights
	Animation	0.2534
	Average Rating	0.0423
	Musical	0.0119
	Children's	-0.0723