Methods	Yelp		ML-100K		Clothing		CDs		Movies		Taobao		Electronics	
	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10
OpenP5-R (seen)	0.00004	0.00009	0.0551	0.0922	0.0022	0.0034	0.0021	0.0032	0.0085	0.0141	0.1651	0.1827	0.0080	0.0114
OpenP5-S (seen)	0.0247	0.0353	0.0678	0.1208	0.0024	0.0042	0.0138	0.0218	0.0211	0.0326	0.1425	0.1702	0.0116	0.0147
OpenP5-C (seen)	0.0265	0.0432	0.0530	0.1006	0.0082	0.0127	0.0222	0.0352	0.0253	0.0412	0.0683	0.1012	0.0225	0.0340
SP5-R (seen)	0.0027	0.0037	0.0138	0.0233	0.0006	0.0011	0.0021	0.0029	0.0076	0.0123	0.0899	0.1009	0.0079	0.0111
SP5-S (seen)	0.0209	0.0280	0.0339	0.0477	0.0008	0.0018	0.0091	0.0136	0.0130	0.0194	0.1198	0.1366	0.0102	0.0128
SP5-C (seen)	0.0215	0.0360	0.0328	0.0646	0.0024	0.0049	0.0152	0.0245	0.0181	0.0304	0.1343	0.1635	0.0179	0.0281
OpenP5-R (unseen)	0.00004	0.00009	0.0530	0.0890	0.0023	0.0036	0.0022	0.0033	0.0088	0.0140	0.1643	0.1804	0.0082	0.0117
OpenP5-S (unseen)	0.0246	0.0355	0.0689	0.1155	0.0024	0.0045	0.0140	0.0220	0.0212	0.0329	0.1420	0.1704	0.0116	0.0148
OpenP5-C (unseen)	0.0264	0.0436	0.0561	0.0953	0.0084	0.0128	0.0225	0.0356	0.0254	0.0414	0.0678	0.1004	0.0226	0.0340
SP5-R (unseen)	0.0027	0.0037	0.0169	0.0307	0.0006	0.0015	0.0021	0.0029	0.0076	0.0119	0.0472	0.0559	0.0078	0.0110
SP5-S (unseen)	0.0209	0.0277	0.0244	0.0403	0.0009	0.0020	0.0090	0.0134	0.0131	0.0196	0.1152	0.1337	0.0104	0.0132
SP5-C (unseen)	0.0213	0.0360	0.0413	0.0689	0.0034	0.0061	0.0153	0.0244	0.0179	0.0297	0.1071	0.1409	0.0183	0.0283

Table 1: Hit Ratio results on sequential recommendation task. R, S, C represent three item indexing.

Methods	Yelp		ML-100K		Clothing		CDs		Movies		Taobao		Electronics	
	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10
OpenP5-R (seen)	0.00002	0.00004	0.0352	0.0470	0.0012	0.0016	0.0015	0.0019	0.0055	0.0073	0.1286	0.1344	0.0051	0.0062
OpenP5-S (seen)	0.0170	0.0205	0.0427	0.0595	0.0014	0.0020	0.0084	0.0110	0.0134	0.0171	0.1113	0.1203	0.0078	0.0089
OpenP5-C (seen)	0.0169	0.0222	0.0331	0.0481	0.0055	0.0070	0.0137	0.0179	0.0158	0.0209	0.0472	0.0577	0.0147	0.0184
SP5-R (seen)	0.0017	0.0020	0.0086	0.0117	0.0004	0.0005	0.0014	0.0017	0.0046	0.0061	0.0741	0.0776	0.0048	0.0058
SP5-S (seen)	0.0150	0.0173	0.0197	0.0240	0.0005	0.0008	0.0059	0.0074	0.0083	0.0104	0.0995	0.1051	0.0069	0.0078
SP5-C (seen)	0.0134	0.0181	0.0195	0.0295	0.0013	0.0021	0.0096	0.0125	0.0112	0.0152	0.1091	0.1185	0.0113	0.0146
OpenP5-R (unseen)	0.00002	0.00004	0.0345	0.0460	0.0014	0.0018	0.0015	0.0019	0.0056	0.0073	0.1278	0.1331	0.0053	0.0064
OpenP5-S (unseen)	0.0171	0.0206	0.0430	0.0578	0.0014	0.0021	0.0085	0.0110	0.0136	0.0174	0.1100	0.1191	0.0078	0.0088
OpenP5-C (unseen)	0.0168	0.0223	0.0341	0.0465	0.0056	0.0070	0.0141	0.0184	0.0158	0.0210	0.0463	0.0568	0.0147	0.0184
SP5-R (unseen)	0.0018	0.0021	0.0104	0.0147	0.0004	0.0007	0.0015	0.0017	0.0045	0.0059	0.0383	0.0411	0.0048	0.0058
SP5-S (unseen)	0.0148	0.0171	0.0171	0.0223	0.0006	0.0009	0.0058	0.0072	0.0084	0.0105	0.0955	0.1015	0.0070	0.0080
SP5-C (unseen)	0.0133	0.0180	0.0255	0.0341	0.0020	0.0029	0.0096	0.0125	0.0111	0.0149	0.0853	0.0962	0.0115	0.0147

Table 2: NDCG results on sequential recommendation task. R, S, C represent three item indexing.

Methods	Yelp		ML-100K		Clothing		CDs		Movies		Taobao		Electronics	
	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10	HR@5	HR@10
OpenP5-R (seen)	0.00005	0.00007	0.0212	0.0403	0.0021	0.0037	0.0021	0.0032	0.0072	0.0124	0.0126	0.0195	0.0078	0.0105
OpenP5-S (seen)	0.0021	0.0031	0.0095	0.0265	0.0012	0.0022	0.0034	0.0053	0.0075	0.0111	0.0179	0.0279	0.0090	0.0109
OpenP5-C (seen)	0.0068	0.0117	0.0244	0.0498	0.0051	0.0081	0.0092	0.0150	0.0099	0.0164	0.0028	0.0052	0.0133	0.0222
SP5-R (seen)	0.0028	0.0039	0.0021	0.0106	0.0006	0.0010	0.0021	0.0030	0.0077	0.0124	0.1099	0.1222	0.0082	0.0109
SP5-S (seen)	0.0013	0.0017	0.0021	0.0074	0.0005	0.0013	0.0023	0.0034	0.0079	0.0106	0.1229	0.1411	0.0096	0.0115
SP5-C (seen)	0.0039	0.0069	0.0009	0.0074	0.0010	0.0025	0.0043	0.0068	0.0093	0.0157	0.1188	0.1450	0.0142	0.0234
OpenP5-R (unseen)	0.00004	0.00007	0.0201	0.0445	0.0022	0.0037	0.0017	0.0028	0.0053	0.0106	0.0149	0.0221	0.0083	0.0103
OpenP5-S (unseen)	0.0013	0.0018	0.0212	0.0328	0.0010	0.0020	0.0017	0.0029	0.0049	0.0068	0.0125	0.0188	0.0096	0.0109
OpenP5-C (unseen)	0.0037	0.0065	0.0233	0.0328	0.0038	0.0058	0.0037	0.0060	0.0084	0.0142	0.0007	0.0015	0.0142	0.0225
SP5-R (unseen)	0.0027	0.0039	0.0095	0.0233	0.0004	0.0008	0.0020	0.0028	0.0043	0.0077	0.0138	0.0183	0.0067	0.0094
SP5-S (unseen)	0.0011	0.0016	0.0201	0.0297	0.0005	0.0012	0.0013	0.0021	0.0031	0.0041	0.0165	0.0231	0.0054	0.0064
SP5-C (unseen)	0.0037	0.0064	0.0138	0.0233	0.0012	0.0022	0.0027	0.0048	0.0092	0.0153	0.0179	0.0246	0.0164	0.0240

Table 3: Hit Ratio results on straightforward recommendation task. R, S, C represent three item indexing.

Methods	Yelp		ML-100K		Clothing		CDs		Movies		Taobao		Electronics	
	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10	NDCG@5	NDCG@10
OpenP5-R (seen)	0.00002	0.00003	0.0142	0.0203	0.0014	0.0019	0.0015	0.0019	0.0047	0.0064	0.0082	0.0105	0.0048	0.0057
OpenP5-S (seen)	0.0014	0.0017	0.0049	0.0103	0.0007	0.0011	0.0021	0.0027	0.0048	0.0060	0.0121	0.0153	0.0062	0.0068
OpenP5-C (seen)	0.0042	0.0058	0.0128	0.0208	0.0031	0.0041	0.0059	0.0078	0.0059	0.0080	0.0017	0.0025	0.0083	0.0112
SP5-R (seen)	0.0018	0.0022	0.0010	0.0035	0.0003	0.0004	0.0015	0.0018	0.0046	0.0061	0.0898	0.0938	0.0050	0.0059
SP5-S (seen)	0.0008	0.0010	0.0010	0.0026	0.0002	0.0005	0.0015	0.0019	0.0050	0.0058	0.0998	0.1056	0.0067	0.0073
SP5-C (seen)	0.0024	0.0034	0.0006	0.0022	0.0005	0.0010	0.0028	0.0036	0.0056	0.0077	0.0948	0.1032	0.0089	0.0118
OpenP5-R (unseen)	0.00002	0.00003	0.0112	0.0190	0.0014	0.0019	0.0012	0.0015	0.0033	0.0050	0.0094	0.0117	0.0048	0.0055
OpenP5-S (unseen)	0.0009	0.0010	0.0133	0.0168	0.0007	0.0010	0.0010	0.0014	0.0031	0.0038	0.0084	0.0105	0.0067	0.0071
OpenP5-C (unseen)	0.0023	0.0032	0.0113	0.0143	0.0023	0.0030	0.0024	0.0031	0.0052	0.0071	0.0003	0.0005	0.0090	0.0117
SP5-R (unseen)	0.0018	0.0021	0.0055	0.0101	0.0002	0.0003	0.0013	0.0016	0.0026	0.0037	0.0100	0.0115	0.0037	0.0045
SP5-S (unseen)	0.0007	0.0008	0.0124	0.0154	0.0003	0.0006	0.0009	0.0011	0.0020	0.0023	0.0122	0.0143	0.0037	0.0040
SP5-C (unseen)	0.0022	0.0031	0.0081	0.0112	0.0007	0.0010	0.0017	0.0024	0.0054	0.0074	0.0125	0.0147	0.0101	0.0125

Table 4: NDCG results on straightforward recommendation task. R, S, C represent three item indexing.