**BCE LOSS:**

**# BASELINE - Next Item training**

Evaluation statistics when evaluating over all k-steps into the future:

Test:

NDCG@10 Test Average: 0.3638

HR@10 Test Average: 0.7205

Kendall's Tau Average: 0.1604

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.5556

HR@10 Test Average: 0.8164

Sequence\_Score@10 Test Average: 0.5278

HT\_Ordered@10 Test Average: 0.6721

Kendall's Tau Test Average: 0.1450

Position in future Test\_NDCG Test\_HR Test\_Sequence\_Score Test\_HT\_Ordered\_Score

1 0.6404 0.8827 0.6812 0.7820

2 0.6053 0.8562 0.6636 0.7599

3 0.5850 0.8410 0.6174 0.7292

4 0.5518 0.8132 0.5418 0.6775

5 0.5257 0.7898 0.4682 0.6290

6 0.4993 0.7750 0.4019 0.5885

7 0.4816 0.7566 0.3207 0.5387

--------------------------------------------------------------------------------------------------------

**# INDEPENDENT FEEDING SPLIT - Next Item training**

Evaluation statistics when evaluating over all k-steps into the future:

NDCG@10 Test Average: 0.3482

HR@10 Test Average: 0.6884

Kendall's Tau Average: 0.1156

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.5226

HR@10 Test Average: 0.7929

Sequence\_Score@10 Test Average: 0.5087

HT\_Ordered@10 Test Average: 0.6508

Kendall's Tau Average: 0.1061

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_Score

1 0.5852 0.8439 0.6193 0.7316

2 0.5641 0.8269 0.6276 0.7273

3 0.5416 0.8150 0.5963 0.7056

4 0.5213 0.7900 0.5317 0.6609

5 0.4999 0.7746 0.4677 0.6211

6 0.4807 0.7553 0.3969 0.5761

7 0.4657 0.7448 0.3218 0.5333

Execution time: 0.08261990547180176 seconds

-------------------------------------------------------------------------------------------

**# TEACHER FORCING FEEDING SPLIT - Next Item training**

Evaluation statistics when evaluating for each k-step into the future: - EPOCH 80

NDCG@10 Test Average: 0.5582

HR@10 Test Average: 0.8193

Sequence\_Score@10 Test Average: 0.5313

HT\_Ordered@10 Test Average: 0.6753

Kendall's Tau Test Average: 0.1467

NDCG@10 Valid Average: 0.5671

HR@10 Valid Average: 0.8277

Sequence\_Score@10 Valid Average: 0.5342

HT\_Ordered@10 Valid Average: 0.6810

Kendall's Tau Valid Average: 0.1342

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.6435 0.8843 0.6874 0.7858 0.6423 0.8816 0.6861 0.7839

2 0.6090 0.8591 0.6644 0.7617 0.6151 0.8669 0.6719 0.7694

3 0.5881 0.8465 0.6214 0.7340 0.5898 0.8506 0.6225 0.7366

4 0.5549 0.8152 0.5488 0.6820 0.5697 0.8356 0.5592 0.6974

5 0.5263 0.7917 0.4707 0.6312 0.5403 0.8041 0.4794 0.6418

6 0.5031 0.7787 0.4029 0.5908 0.5215 0.7881 0.3969 0.5925

7 0.4826 0.7596 0.3238 0.5417 0.4907 0.7672 0.3234 0.5453

**# ALL ACTION**

Evaluation statistics when evaluating over all k-steps into the future:

NDCG@10 Test Average: 0.2891

HR@10 Test Average: 0.5654

Kendall's Tau Average: 0.0914

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.4101

HR@10 Test Average: 0.6576

Sequence\_Score@10 Test Average: 0.4160

HT\_Ordered@10 Test Average: 0.5368

Kendall's Tau Average: 0.0917

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_Score

1 0.4658 0.7136 0.4846 0.5991

2 0.4499 0.6921 0.4932 0.5926

3 0.4289 0.6740 0.4760 0.5750

4 0.4102 0.6638 0.4428 0.5533

5 0.3818 0.6354 0.3939 0.5146

6 0.3751 0.6159 0.3353 0.4756

7 0.3589 0.6085 0.2863 0.4474

16 SAMPLES ALL ACTION

NDCG@10 Test Average: 0.4267

HR@10 Test Average: 0.6827

Sequence\_Score@10 Test Average: 0.4303

HT\_Ordered@10 Test Average: 0.5565

Kendall's Tau Test Average: 0.0857

**# DENSE ALL ACTION**

Evaluation statistics when evaluating over all k-steps into the future:

NDCG@10 Test Average: 0.2110

HR@10 Test Average: 0.4328

Kendall's Tau Average: 0.0528

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.2853

HR@10 Test Average: 0.5184

Sequence\_Score@10 Test Average: 0.3166

HT\_Ordered@10 Test Average: 0.4175

Kendall's Tau Test Average: 0.0492

Position in future Test\_NDCG Test\_HR Test\_Sequence\_Score Test\_HT\_Ordered\_Score

1 0.3044 0.5390 0.2988 0.4189 0.3532

2 0.3063 0.5422 0.3368 0.4395 0.3436

3 0.2933 0.5301 0.3567 0.4434 0.3357

4 0.2823 0.5199 0.3443 0.4321 0.3316

5 0.2761 0.5051 0.3236 0.4143 0.3254

6 0.2704 0.5008 0.2967 0.3987 0.3160

7 0.2644 0.4919 0.2596 0.3757 0.3000

**# SUPER DENSE ALL ACTION**

Evaluation statistics when evaluating for each k-step into the future: - EPOCH 80

NDCG@10 Test Average: 0.2961

HR@10 Test Average: 0.5397

Sequence\_Score@10 Test Average: 0.3254

HT\_Ordered@10 Test Average: 0.4326

Kendall's Tau Test Average: 0.0434

NDCG@10 Valid Average: 0.3212

HR@10 Valid Average: 0.5805

Sequence\_Score@10 Valid Average: 0.3542

HT\_Ordered@10 Valid Average: 0.4674

Kendall's Tau Valid Average: 0.0407

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.3136 0.5635 0.3041 0.4338 0.3379 0.6083 0.3369 0.4726

2 0.3117 0.5633 0.3489 0.4561 0.3306 0.5863 0.3687 0.4775

3 0.3062 0.5553 0.3633 0.4593 0.3258 0.5816 0.3884 0.4850

4 0.2917 0.5336 0.3552 0.4444 0.3270 0.5849 0.3858 0.4854

5 0.2814 0.5244 0.3371 0.4307 0.3145 0.5683 0.3622 0.4652

6 0.2891 0.5216 0.3013 0.4115 0.3130 0.5765 0.3426 0.4595

7 0.2793 0.5164 0.2679 0.3921 0.2998 0.5577 0.2948 0.4262

**SAMPLED SOFTMAX LOSS**

**BASELINE**

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.5557

HR@10 Test Average: 0.8055

Sequence\_Score@10 Test Average: 0.5211

HT\_Ordered@10 Test Average: 0.6633

Kendall's Tau Test Average: 0.1501

NDCG@10 Valid Average: 0.5646

HR@10 Valid Average: 0.8154

Sequence\_Score@10 Valid Average: 0.5252

HT\_Ordered@10 Valid Average: 0.6703

Kendall's Tau Valid Average: 0.1311

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.6424 0.8734 0.6834 0.7784 0.6434 0.8767 0.6797 0.7782

2 0.6162 0.8536 0.6633 0.7585 0.6126 0.8471 0.6646 0.7558

3 0.5845 0.8254 0.6042 0.7148 0.5854 0.8362 0.6160 0.7261

4 0.5495 0.8052 0.5374 0.6713 0.5682 0.8223 0.5461 0.6842

5 0.5214 0.7768 0.4617 0.6192 0.5354 0.7922 0.4664 0.6293

6 0.4953 0.7620 0.3920 0.5770 0.5210 0.7789 0.3912 0.5850

7 0.4807 0.7422 0.3060 0.5241 0.4864 0.7547 0.3122 0.5334

**# INDEPENDENT FEEDING SPLIT - Next Item training**

Evaluation statistics when evaluating for each k-step into the future: - EPOCH 100

NDCG@10 Test Average: 0.5609

HR@10 Test Average: 0.8115

Sequence\_Score@10 Test Average: 0.5234

HT\_Ordered@10 Test Average: 0.6675

Kendall's Tau Test Average: 0.1356

NDCG@10 Valid Average: 0.5668

HR@10 Valid Average: 0.8178

Sequence\_Score@10 Valid Average: 0.5227

HT\_Ordered@10 Valid Average: 0.6702

Kendall's Tau Valid Average: 0.1094

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.6418 0.8712 0.6814 0.7763 0.6374 0.8647 0.6763 0.7705

2 0.6094 0.8478 0.6569 0.7523 0.6059 0.8490 0.6574 0.7532

3 0.5896 0.8339 0.6141 0.7240 0.5847 0.8419 0.6129 0.7274

4 0.5552 0.8106 0.5433 0.6770 0.5694 0.8261 0.5500 0.6881

5 0.5297 0.7846 0.4624 0.6235 0.5391 0.7935 0.4653 0.6294

6 0.5105 0.7731 0.3904 0.5817 0.5297 0.7916 0.3974 0.5945

7 0.4902 0.7596 0.3153 0.5374 0.5015 0.7574 0.2998 0.5286

**# TEACHER FORCING FEEDING SPLIT - Next Item training**

Evaluation statistics when evaluating for each k-step into the future: - EPOCH 100

NDCG@10 Test Average: 0.5660

HR@10 Test Average: 0.8161

Sequence\_Score@10 Test Average: 0.5272

HT\_Ordered@10 Test Average: 0.6717

Kendall's Tau Test Average: 0.1509

NDCG@10 Valid Average: 0.5767

HR@10 Valid Average: 0.8249

Sequence\_Score@10 Valid Average: 0.5325

HT\_Ordered@10 Valid Average: 0.6787

Kendall's Tau Valid Average: 0.1321

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.6502 0.8819 0.6906 0.7862 0.6575 0.8810 0.7007 0.7908

2 0.6177 0.8532 0.6638 0.7585 0.6208 0.8620 0.6768 0.7694

3 0.5990 0.8436 0.6176 0.7306 0.5978 0.8443 0.6217 0.7330

4 0.5640 0.8172 0.5467 0.6819 0.5800 0.8256 0.5500 0.6878

5 0.5351 0.7887 0.4652 0.6270 0.5488 0.8022 0.4723 0.6372

6 0.5103 0.7735 0.3929 0.5832 0.5285 0.7911 0.3948 0.5929

7 0.4859 0.7548 0.3137 0.5343 0.5038 0.7680 0.3113 0.5396

**# ALL ACTION**

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.4256

HR@10 Test Average: 0.6833

Sequence\_Score@10 Test Average: 0.4319

HT\_Ordered@10 Test Average: 0.5576

Kendall's Tau Test Average: 0.0888

NDCG@10 Valid Average: 0.4494

HR@10 Valid Average: 0.7138

Sequence\_Score@10 Valid Average: 0.4501

HT\_Ordered@10 Valid Average: 0.5820

Kendall's Tau Valid Average: 0.0781

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4737 0.7370 0.4879 0.6125 0.5023 0.7653 0.5260 0.6456

2 0.4650 0.7170 0.5142 0.6156 0.4720 0.7316 0.5245 0.6281

3 0.4393 0.7021 0.4927 0.5974 0.4585 0.7202 0.5101 0.6151

4 0.4268 0.6814 0.4590 0.5702 0.4525 0.7210 0.4793 0.6002

5 0.4093 0.6667 0.4138 0.5402 0.4311 0.7020 0.4333 0.5676

6 0.3907 0.6439 0.3541 0.4990 0.4317 0.6960 0.3732 0.5346

7 0.3743 0.6350 0.3018 0.4684 0.3976 0.6604 0.3046 0.4825

**16 Neg SAMPLES ALL ACTION**

Evaluation statistics when evaluating for each k-step into the future: 200 epochs

NDCG@10 Test Average: 0.4329

HR@10 Test Average: 0.6908

Sequence\_Score@10 Test Average: 0.4349

HT\_Ordered@10 Test Average: 0.5628

Kendall's Tau Test Average: 0.0895

NDCG@10 Valid Average: 0.4552

HR@10 Valid Average: 0.7186

Sequence\_Score@10 Valid Average: 0.4534

HT\_Ordered@10 Valid Average: 0.5860

Kendall's Tau Valid Average: 0.0781

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4866 0.7488 0.5075 0.6281 0.5071 0.7699 0.5332 0.6516

2 0.4683 0.7225 0.5190 0.6208 0.4878 0.7468 0.5368 0.6418

3 0.4460 0.7058 0.4944 0.6001 0.4702 0.7332 0.5193 0.6262

4 0.4395 0.6997 0.4680 0.5839 0.4498 0.7107 0.4729 0.5918

5 0.4116 0.6682 0.4065 0.5374 0.4359 0.6968 0.4250 0.5609

6 0.3969 0.6508 0.3528 0.5018 0.4293 0.7020 0.3806 0.5413

7 0.3817 0.6400 0.2956 0.4678 0.4065 0.6705 0.3057 0.4881

**# All action Autoreg**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.4214

HR@10 Test Average: 0.6763

Sequence\_Score@10 Test Average: 0.4225

HT\_Ordered@10 Test Average: 0.5494

Kendall's Tau Test Average: 0.0679

NDCG@10 Valid Average: 0.4406

HR@10 Valid Average: 0.7000

Sequence\_Score@10 Valid Average: 0.4391

HT\_Ordered@10 Valid Average: 0.5695

Kendall's Tau Valid Average: 0.0678

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4614 0.7223 0.4806 0.6014 0.4873 0.7425 0.5058 0.6242

2 0.4446 0.7027 0.4942 0.5985 0.4687 0.7256 0.5152 0.6204

3 0.4406 0.6958 0.4820 0.5889 0.4463 0.7082 0.4969 0.6026

4 0.4195 0.6727 0.4523 0.5625 0.4395 0.6941 0.4614 0.5778

5 0.4046 0.6630 0.4095 0.5362 0.4172 0.6764 0.4170 0.5467

6 0.3931 0.6378 0.3438 0.4908 0.4236 0.6903 0.3741 0.5322

7 0.3857 0.6395 0.2946 0.4671 0.4015 0.6629 0.3030 0.4829

**# All action Teacher Forcing**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.4694

HR@10 Test Average: 0.7235

Sequence\_Score@10 Test Average: 0.4614

HT\_Ordered@10 Test Average: 0.5924

Kendall's Tau Test Average: 0.1068

NDCG@10 Valid Average: 0.4798

HR@10 Valid Average: 0.7358

Sequence\_Score@10 Valid Average: 0.4679

HT\_Ordered@10 Valid Average: 0.6019

Kendall's Tau Valid Average: 0.0980

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.5360 0.7781 0.5609 0.6695 0.5416 0.7862 0.5704 0.6783

2 0.5126 0.7631 0.5627 0.6629 0.5204 0.7666 0.5629 0.6648

3 0.4915 0.7455 0.5283 0.6369 0.4946 0.7612 0.5412 0.6512

4 0.4613 0.7201 0.4863 0.6032 0.4827 0.7384 0.4932 0.6158

5 0.4492 0.7068 0.4262 0.5665 0.4579 0.7134 0.4288 0.5711

6 0.4257 0.6834 0.3674 0.5254 0.4447 0.7055 0.3756 0.5406

7 0.4097 0.6673 0.2978 0.4826 0.4166 0.6792 0.3033 0.4912

**# DENSE ALL ACTION**

Evaluation statistics when evaluating for each k-step into the future: - 40 EPOCHS

NDCG@10 Test Average: 0.3077

HR@10 Test Average: 0.5478

Sequence\_Score@10 Test Average: 0.3337

HT\_Ordered@10 Test Average: 0.4408

Kendall's Tau Test Average: 0.0466

NDCG@10 Valid Average: 0.3315

HR@10 Valid Average: 0.5841

Sequence\_Score@10 Valid Average: 0.3554

HT\_Ordered@10 Valid Average: 0.4697

Kendall's Tau Valid Average: 0.0408

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.3253 0.5681 0.3204 0.4443 0.3511 0.6131 0.3533 0.4832

2 0.3234 0.5689 0.3643 0.4666 0.3439 0.6028 0.3852 0.4940

3 0.3179 0.5613 0.3725 0.4669 0.3352 0.5941 0.3950 0.4946

4 0.3055 0.5451 0.3600 0.4525 0.3356 0.5909 0.3907 0.4908

5 0.2988 0.5377 0.3427 0.4402 0.3240 0.5686 0.3585 0.4635

6 0.2944 0.5286 0.3068 0.4177 0.3218 0.5640 0.3220 0.4430

7 0.2888 0.5249 0.2694 0.3971 0.3091 0.5550 0.2832 0.4191

**# SUPER DENSE ALL ACTION**

Evaluation statistics when evaluating for each k-step into the future: - EPOCH 60

NDCG@10 Test Average: 0.3055

HR@10 Test Average: 0.5468

Sequence\_Score@10 Test Average: 0.3332

HT\_Ordered@10 Test Average: 0.4400

Kendall's Tau Test Average: 0.0486

NDCG@10 Valid Average: 0.3320

HR@10 Valid Average: 0.5849

Sequence\_Score@10 Valid Average: 0.3562

HT\_Ordered@10 Valid Average: 0.4706

Kendall's Tau Valid Average: 0.0428

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.3215 0.5653 0.3182 0.4417 0.3499 0.6072 0.3474 0.4773

2 0.3225 0.5687 0.3619 0.4653 0.3474 0.5985 0.3844 0.4915

3 0.3151 0.5581 0.3713 0.4647 0.3376 0.5982 0.3942 0.4962

4 0.3035 0.5470 0.3599 0.4535 0.3376 0.5911 0.3920 0.4916

5 0.2978 0.5368 0.3449 0.4409 0.3242 0.5740 0.3612 0.4676

6 0.2927 0.5264 0.3049 0.4156 0.3205 0.5735 0.3329 0.4532

7 0.2857 0.5253 0.2710 0.3982 0.3069 0.5520 0.2815 0.4168

**# Future Rolling Window**

Evaluation statistics when evaluating for each k-step into the future: - EPOCHS: 200

NDCG@10 Test Average: 0.2827

HR@10 Test Average: 0.5274

Sequence\_Score@10 Test Average: 0.3161

HT\_Ordered@10 Test Average: 0.4217

Kendall's Tau Test Average: 0.0360

NDCG@10 Valid Average: 0.2836

HR@10 Valid Average: 0.5315

Sequence\_Score@10 Valid Average: 0.3191

HT\_Ordered@10 Valid Average: 0.4253

Kendall's Tau Valid Average: 0.0290

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.2934 0.5427 0.2809 0.4118 0.2989 0.5553 0.2831 0.4192

2 0.2923 0.5416 0.3237 0.4326 0.2832 0.5273 0.3213 0.4243

3 0.2905 0.5396 0.3512 0.4454 0.2856 0.5371 0.3515 0.4443

4 0.2829 0.5266 0.3425 0.4346 0.2908 0.5420 0.3554 0.4487

5 0.2747 0.5155 0.3328 0.4242 0.2782 0.5175 0.3304 0.4240

6 0.2762 0.5151 0.3067 0.4109 0.2825 0.5292 0.3153 0.4223

7 0.2690 0.5110 0.2746 0.3928 0.2663 0.5118 0.2769 0.3943

**# CE OVER LOSS**

**# All action**

Evaluation statistics when evaluating for each k-step into the future: - Epoch 200

NDCG@10 Test Average: 0.4233

HR@10 Test Average: 0.6843

Sequence\_Score@10 Test Average: 0.4298

HT\_Ordered@10 Test Average: 0.5571

Kendall's Tau Test Average: 0.0873

NDCG@10 Valid Average: 0.4426

HR@10 Valid Average: 0.7099

Sequence\_Score@10 Valid Average: 0.4471

HT\_Ordered@10 Valid Average: 0.5785

Kendall's Tau Valid Average: 0.0763

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4780 0.7427 0.4985 0.6206 0.4912 0.7626 0.5149 0.6387

2 0.4622 0.7262 0.5122 0.6192 0.4709 0.7368 0.5201 0.6284

3 0.4404 0.7060 0.4951 0.6006 0.4521 0.7240 0.5099 0.6169

4 0.4184 0.6817 0.4507 0.5662 0.4496 0.7148 0.4805 0.5976

5 0.4032 0.6610 0.4067 0.5339 0.4272 0.6873 0.4219 0.5546

6 0.3901 0.6456 0.3508 0.4982 0.4123 0.6764 0.3688 0.5226

7 0.3711 0.6274 0.2946 0.4610 0.3947 0.6675 0.3137 0.4906

**# All action Masking 15%**

Evaluation statistics when evaluating for each k-step into the future: 150 EPOCHS

NDCG@10 Test Average: 0.4234

HR@10 Test Average: 0.6845

Sequence\_Score@10 Test Average: 0.4310

HT\_Ordered@10 Test Average: 0.5578

Kendall's Tau Test Average: 0.0893

NDCG@10 Valid Average: 0.4396

HR@10 Valid Average: 0.7051

Sequence\_Score@10 Valid Average: 0.4457

HT\_Ordered@10 Valid Average: 0.5754

Kendall's Tau Valid Average: 0.0805

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4750 0.7309 0.4899 0.6104 0.4904 0.7601 0.5145 0.6373

2 0.4579 0.7229 0.5115 0.6172 0.4715 0.7319 0.5229 0.6274

3 0.4426 0.7077 0.4960 0.6019 0.4503 0.7207 0.5075 0.6141

4 0.4228 0.6916 0.4628 0.5772 0.4383 0.7031 0.4759 0.5895

5 0.4035 0.6588 0.4051 0.5320 0.4204 0.6832 0.4247 0.5540

6 0.3899 0.6469 0.3557 0.5013 0.4165 0.6854 0.3732 0.5293

7 0.3722 0.6324 0.2963 0.4643 0.3899 0.6515 0.3011 0.4763

**# All action Autoreg**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.4360

HR@10 Test Average: 0.7028

Sequence\_Score@10 Test Average: 0.4428

HT\_Ordered@10 Test Average: 0.5728

Kendall's Tau Test Average: 0.0811

NDCG@10 Valid Average: 0.4498

HR@10 Valid Average: 0.7208

Sequence\_Score@10 Valid Average: 0.4548

HT\_Ordered@10 Valid Average: 0.5878

Kendall's Tau Valid Average: 0.0694

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.4792 0.7414 0.5006 0.6210 0.4986 0.7699 0.5248 0.6474

2 0.4701 0.7375 0.5241 0.6308 0.4767 0.7482 0.5401 0.6441

3 0.4599 0.7277 0.5119 0.6198 0.4536 0.7283 0.5101 0.6192

4 0.4303 0.7010 0.4712 0.5861 0.4522 0.7213 0.4855 0.6034

5 0.4182 0.6834 0.4210 0.5522 0.4317 0.7028 0.4347 0.5687

6 0.4053 0.6714 0.3659 0.5187 0.4251 0.6979 0.3811 0.5395

7 0.3893 0.6571 0.3051 0.4811 0.4108 0.6770 0.3070 0.4920

**# All action Teacher Forcing**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.4733

HR@10 Test Average: 0.7349

Sequence\_Score@10 Test Average: 0.4693

HT\_Ordered@10 Test Average: 0.6021

Kendall's Tau Test Average: 0.1072

NDCG@10 Valid Average: 0.4809

HR@10 Valid Average: 0.7461

Sequence\_Score@10 Valid Average: 0.4746

HT\_Ordered@10 Valid Average: 0.6103

Kendall's Tau Valid Average: 0.0950

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.5388 0.7993 0.5680 0.6837 0.5411 0.8011 0.5710 0.6861

2 0.5154 0.7757 0.5745 0.6751 0.5169 0.7715 0.5679 0.6697

3 0.4914 0.7594 0.5466 0.6530 0.4955 0.7694 0.5467 0.6580

4 0.4745 0.7349 0.4931 0.6140 0.4779 0.7452 0.4979 0.6216

5 0.4467 0.7008 0.4260 0.5634 0.4679 0.7321 0.4460 0.5891

6 0.4325 0.6949 0.3722 0.5335 0.4454 0.7139 0.3813 0.5476

7 0.4139 0.6790 0.3044 0.4917 0.4216 0.6895 0.3113 0.5004

**# Future Rolling Window:**

Evaluation statistics when evaluating for each k-step into the future:

NDCG@10 Test Average: 0.2711

HR@10 Test Average: 0.5077

Sequence\_Score@10 Test Average: 0.3025

HT\_Ordered@10 Test Average: 0.4051

Kendall's Tau Test Average: 0.0345

NDCG@10 Valid Average: 0.2750

HR@10 Valid Average: 0.5204

Sequence\_Score@10 Valid Average: 0.3105

HT\_Ordered@10 Valid Average: 0.4154

Kendall's Tau Valid Average: 0.0305

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.2833 0.5264 0.2672 0.3968 0.2881 0.5363 0.2785 0.4074

2 0.2784 0.5188 0.3126 0.4157 0.2783 0.5311 0.3087 0.4199

3 0.2757 0.5144 0.3269 0.4207 0.2716 0.5153 0.3344 0.4249

4 0.2703 0.5018 0.3309 0.4163 0.2795 0.5319 0.3503 0.4411

5 0.2608 0.4997 0.3206 0.4101 0.2677 0.5148 0.3282 0.4215

6 0.2661 0.4969 0.2959 0.3964 0.2709 0.5023 0.3003 0.4013

7 0.2633 0.4960 0.2633 0.3796 0.2692 0.5107 0.2733 0.3920

**# Future Rolling Window Autoregr:**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.2711

HR@10 Test Average: 0.5076

Sequence\_Score@10 Test Average: 0.3047

HT\_Ordered@10 Test Average: 0.4062

Kendall's Tau Test Average: 0.0300

NDCG@10 Valid Average: 0.2894

HR@10 Valid Average: 0.5393

Sequence\_Score@10 Valid Average: 0.3227

HT\_Ordered@10 Valid Average: 0.4310

Kendall's Tau Valid Average: 0.0252

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.2854 0.5283 0.2720 0.4002 0.3105 0.5667 0.2924 0.4295

2 0.2769 0.5157 0.3167 0.4162 0.2899 0.5382 0.3267 0.4324

3 0.2766 0.5164 0.3348 0.4256 0.2877 0.5428 0.3504 0.4466

4 0.2678 0.5047 0.3318 0.4182 0.2950 0.5482 0.3574 0.4528

5 0.2624 0.4988 0.3208 0.4098 0.2763 0.5235 0.3390 0.4313

6 0.2696 0.5018 0.2985 0.4002 0.2903 0.5422 0.3233 0.4328

7 0.2594 0.4875 0.2582 0.3729 0.2762 0.5134 0.2694 0.3914

**# Future Rolling Window Teacher forcing:**

Evaluation statistics when evaluating for each k-step into the future: 200

NDCG@10 Test Average: 0.2663

HR@10 Test Average: 0.5013

Sequence\_Score@10 Test Average: 0.2983

HT\_Ordered@10 Test Average: 0.3998

Kendall's Tau Test Average: 0.0357

NDCG@10 Valid Average: 0.2737

HR@10 Valid Average: 0.5190

Sequence\_Score@10 Valid Average: 0.3101

HT\_Ordered@10 Valid Average: 0.4145

Kendall's Tau Valid Average: 0.0292

Position in futureTest\_NDCG Test\_HR Test\_Sequence\_ScoreTest\_HT\_Ordered\_ScoreValid\_NDCGValid\_HR Valid\_Sequence\_ScoreValid\_HT\_Ordered\_Score

1 0.2782 0.5240 0.2662 0.3951 0.2892 0.5403 0.2757 0.4080

2 0.2735 0.5138 0.3066 0.4102 0.2764 0.5211 0.3086 0.4148

3 0.2703 0.5092 0.3269 0.4181 0.2776 0.5221 0.3359 0.4290

4 0.2674 0.5010 0.3239 0.4124 0.2798 0.5325 0.3463 0.4394

5 0.2571 0.4875 0.3150 0.4012 0.2639 0.5102 0.3286 0.4194

6 0.2617 0.4893 0.2907 0.3900 0.2697 0.5113 0.3073 0.4093

7 0.2561 0.4840 0.2592 0.3716 0.2593 0.4952 0.2686 0.3819