

```
1 E:\anaconda3\python.exe "C:\Program Files\  
JetBrains\PyCharm Community Edition 2019.1.3\  
helpers\pydev\pydevconsole.py" --mode=client --  
port=63616  
2  
3 import sys; print('Python %s on %s' % (sys.  
version, sys.platform))  
4 sys.path.extend(['E:\\SocialRSonYelp', 'E:/  
SocialRSonYelp'])  
5  
6 Python 3.7.3 (default, Mar 27 2019, 17:13:21) [  
MSC v.1915 64 bit (AMD64)]  
7 Type 'copyright', 'credits' or 'license' for  
more information  
8 IPython 7.4.0 -- An enhanced Interactive Python  
. Type '?' for help.  
9 PyDev console: using IPython 7.4.0  
10  
11 Python 3.7.3 (default, Mar 27 2019, 17:13:21) [  
MSC v.1915 64 bit (AMD64)] on win32  
12 In[2]: runfile('E:/SocialRSonYelp/  
NeuralNetworks/train.py', wdir='E:/  
SocialRSonYelp/NeuralNetworks')  
13 E:\anaconda3\lib\site-packages\gensim\utils.py:  
1197: UserWarning: detected Windows; aliasing  
chunkize to chunkize_serial  
14     warnings.warn("detected Windows; aliasing  
     chunkize to chunkize_serial")  
15 C:\Program Files\JetBrains\PyCharm Community  
Edition 2019.1.3\helpers\pydev\_pydev_bundle\  
pydev_umd.py:197: DtypeWarning: Columns (10)  
have mixed types. Specify dtype option on  
import or set low_memory=False.  
16     pydev_imports.execfile(filename, global_vars  
     , local_vars) # execute the script  
17 671  
18 160563
```

```
19 Range of userId is [0, 670]
20 Range of itemId is [0, 5977]
21 weijings data loader
22 normoalizing ratings
23 get train test
24 NeuMF(
25     (embedding_user_mlp): Embedding(671, 32)
26     (embedding_item_mlp): Embedding(5978, 32)
27     (embedding_user_mf): Embedding(671, 32)
28     (embedding_item_mf): Embedding(5978, 32)
29     (fc_layers): ModuleList(
30         (0): Linear(in_features=64, out_features=32
31             , bias=True)
32         (1): Linear(in_features=32, out_features=16
33             , bias=True)
34         (2): Linear(in_features=16, out_features=8
35             , bias=True)
36     )
37     (affine_output): Linear(in_features=40,
38         out_features=1, bias=True)
39     (logistic): Sigmoid()
40 )
41 Epoch 0 starts !
42 -----
43 -----
44 instance loader
45 total loss: 163.7929883301258
46 E:\SocialRSonYelp\NeuralNetworks\metrics.py:57
47 : SettingWithCopyWarning:
48 A value is trying to be set on a copy of a
49 slice from a DataFrame.
50 Try using .loc[row_indexer,col_indexer] = value
51 instead
52
53 See the caveats in the documentation: http://
54 pandas.pydata.org/pandas-docs/stable/indexing.
55 html#indexing-view-versus-copy
```

```
46 test_in_top_k['ndcg'] = test_in_top_k['rank']
   ].apply(lambda x: math.log(2) / math.log(1 + x
)) # the rank starts from 1
47 [Evluating Epoch 0] HR = 0.4545, NDCG = 0.2594
48 record written!
49 hit_rate 0.45454545454545453
50 ndcg 0.25939508035377806
51 Epoch 1 starts !
52 -----
53 instance loader
54 total loss: 147.8852479159832
55 [Evluating Epoch 1] HR = 0.4709, NDCG = 0.2754
56 record written!
57 hit_rate 0.47093889716840537
58 ndcg 0.2753884422106504
59 Epoch 2 starts !
60 -----
61 instance loader
62 total loss: 137.91157652437687
63 [Evluating Epoch 2] HR = 0.5842, NDCG = 0.3541
64 record written!
65 hit_rate 0.5842026825633383
66 ndcg 0.3541290178170309
67 Epoch 3 starts !
68 -----
69 instance loader
70 total loss: 130.52650141716003
71 [Evluating Epoch 3] HR = 0.6021, NDCG = 0.3573
72 record written!
73 hit_rate 0.6020864381520119
74 ndcg 0.35726257634104125
75 Epoch 4 starts !
76 -----
```

```
77 instance loader
78 total loss: 127.20385020971298
79 [Evluating Epoch 4] HR = 0.6155, NDCG = 0.3646
80 record written!
81 hit_rate 0.6154992548435171
82 ndcg 0.3646083661874654
83 Epoch 5 starts !
84 -----
-----
85 instance loader
86 total loss: 125.07533271610737
87 [Evluating Epoch 5] HR = 0.6155, NDCG = 0.3782
88 record written!
89 hit_rate 0.6154992548435171
90 ndcg 0.3782010256007228
91 Epoch 6 starts !
92 -----
-----
93 instance loader
94 total loss: 123.32012762129307
95 [Evluating Epoch 6] HR = 0.6304, NDCG = 0.3783
96 record written!
97 hit_rate 0.6304023845007451
98 ndcg 0.37833739757532364
99 Epoch 7 starts !
100 -----
-----
101 instance loader
102 total loss: 121.279356315732
103 [Evluating Epoch 7] HR = 0.6349, NDCG = 0.3867
104 record written!
105 hit_rate 0.6348733233979136
106 ndcg 0.3867049217693147
107 Epoch 8 starts !
108 -----
-----
109 instance loader
```

```
110 total loss: 119.51824018359184
111 [Evluating Epoch 8] HR = 0.6423, NDCG = 0.3919
112 record written!
113 hit_rate 0.6423248882265276
114 ndcg 0.3918547309194154
115 Epoch 9 starts !
116 -----
-----
117 instance loader
118 total loss: 117.87164208292961
119 [Evluating Epoch 9] HR = 0.6319, NDCG = 0.3814
120 record written!
121 hit_rate 0.6318926974664679
122 ndcg 0.38139378981471345
123 Epoch 10 starts !
124 -----
-----
125 instance loader
126 total loss: 116.61119784414768
127 [Evluating Epoch 10] HR = 0.6379, NDCG = 0.
4017
128 record written!
129 hit_rate 0.6378539493293591
130 ndcg 0.4017261404069713
131 Epoch 11 starts !
132 -----
-----
133 instance loader
134 total loss: 115.40600110590458
135 [Evluating Epoch 11] HR = 0.6274, NDCG = 0.
3886
136 record written!
137 hit_rate 0.6274217585692996
138 ndcg 0.38855998571239186
139 Epoch 12 starts !
140 -----
```

```
141 instance loader
142 total loss: 114.68247357010841
143 [Evluating Epoch 12] HR = 0.6393, NDCG = 0.
    3934
144 record written!
145 hit_rate 0.639344262295082
146 ndcg 0.3934362503256544
147 Epoch 13 starts !
148 -----
-----
149 instance loader
150 total loss: 113.69572678208351
151 [Evluating Epoch 13] HR = 0.6468, NDCG = 0.
    4021
152 record written!
153 hit_rate 0.646795827123696
154 ndcg 0.40214297419127937
155 Epoch 14 starts !
156 -----
-----
157 instance loader
158 total loss: 113.10294395685196
159 [Evluating Epoch 14] HR = 0.6557, NDCG = 0.
    4014
160 record written!
161 hit_rate 0.6557377049180327
162 ndcg 0.4013693725148748
163 Epoch 15 starts !
164 -----
-----
165 instance loader
166 total loss: 112.14482268691063
167 [Evluating Epoch 15] HR = 0.6334, NDCG = 0.
    3954
168 record written!
169 hit_rate 0.6333830104321908
170 ndcg 0.3953984886792908
```

```
171 Epoch 16 starts !
172 -----
173 instance loader
174 total loss: 111.96293495595455
175 [Evaluating Epoch 16] HR = 0.6438, NDCG = 0.
176 record written!
177 hit_rate 0.6438152011922503
178 ndcg 0.39521623031497216
179 Epoch 17 starts !
180 -----
181 instance loader
182 total loss: 111.2531235665083
183 [Evaluating Epoch 17] HR = 0.6498, NDCG = 0.
184 record written!
185 hit_rate 0.6497764530551415
186 ndcg 0.3994017623530772
187 Epoch 18 starts !
188 -----
189 instance loader
190 total loss: 110.47814635932446
191 [Evaluating Epoch 18] HR = 0.6602, NDCG = 0.
192 record written!
193 hit_rate 0.6602086438152012
194 ndcg 0.40619189982406656
195 Epoch 19 starts !
196 -----
197 instance loader
198 total loss: 110.10551615059376
199 [Evaluating Epoch 19] HR = 0.6662, NDCG = 0.
```

```
200 record written!
201 hit_rate 0.6661698956780924
202 ndcg 0.4026993736700207
203 Epoch 20 starts !
204 -----
-----
205 instance loader
206 total loss: 109.66330994665623
207 [Evluating Epoch 20] HR = 0.6393, NDCG = 0.
3998
208 record written!
209 hit_rate 0.639344262295082
210 ndcg 0.39980580748547745
211 Epoch 21 starts !
212 -----
-----
213 instance loader
214 total loss: 109.40678127110004
215 [Evluating Epoch 21] HR = 0.6438, NDCG = 0.
3969
216 record written!
217 hit_rate 0.6438152011922503
218 ndcg 0.396869002782248
219 Epoch 22 starts !
220 -----
-----
221 instance loader
222 total loss: 108.9966211616993
223 [Evluating Epoch 22] HR = 0.6677, NDCG = 0.
4084
224 record written!
225 hit_rate 0.6676602086438153
226 ndcg 0.4084364119602317
227 Epoch 23 starts !
228 -----
-----
229 instance loader
```

```
230 total loss: 108.64125153422356
231 [Evluating Epoch 23] HR = 0.6423, NDCG = 0.
        4003
232 record written!
233 hit_rate 0.6423248882265276
234 ndcg 0.40031691720144913
235 Epoch 24 starts !
236 -----
-----
237 instance loader
238 total loss: 108.14710868895054
239 [Evluating Epoch 24] HR = 0.6632, NDCG = 0.
        4081
240 record written!
241 hit_rate 0.6631892697466468
242 ndcg 0.4080948691638069
243 Epoch 25 starts !
244 -----
-----
245 instance loader
246 total loss: 107.73476450145245
247 [Evluating Epoch 25] HR = 0.6379, NDCG = 0.
        3924
248 record written!
249 hit_rate 0.6378539493293591
250 ndcg 0.3923857457272084
251 Epoch 26 starts !
252 -----
-----
253 instance loader
254 total loss: 107.2640343606472
255 [Evluating Epoch 26] HR = 0.6528, NDCG = 0.
        4026
256 record written!
257 hit_rate 0.6527570789865872
258 ndcg 0.40263471037282383
259 Epoch 27 starts !
```

```
260 -----
-----
261 instance loader
262 total loss: 107.10252842307091
263 [Evluating Epoch 27] HR = 0.6602, NDCG = 0.
4085
264 record written!
265 hit_rate 0.6602086438152012
266 ndcg 0.4084791103375928
267 Epoch 28 starts !
268 -----
-----
269 instance loader
270 total loss: 107.04770295321941
271 [Evluating Epoch 28] HR = 0.6617, NDCG = 0.
4030
272 record written!
273 hit_rate 0.6616989567809239
274 ndcg 0.40297046119161256
275 Epoch 29 starts !
276 -----
-----
277 instance loader
278 total loss: 106.55729793012142
279 [Evluating Epoch 29] HR = 0.6438, NDCG = 0.
3980
280 record written!
281 hit_rate 0.6438152011922503
282 ndcg 0.39798365217550463
283 Epoch 30 starts !
284 -----
-----
285 instance loader
286 total loss: 106.48550653457642
287 [Evluating Epoch 30] HR = 0.6453, NDCG = 0.
4003
288 record written!
```

```
289 hit_rate 0.6453055141579732
290 ndcg 0.40028209043045665
291 Epoch 31 starts !
292 -----
293 instance loader
294 total loss: 106.3690056502819
295 [Evluating Epoch 31] HR = 0.6349, NDCG = 0.
3880
296 record written!
297 hit_rate 0.6348733233979136
298 ndcg 0.38798849165494786
299 Epoch 32 starts !
300 -----
301 instance loader
302 total loss: 106.06510698795319
303 [Evluating Epoch 32] HR = 0.6423, NDCG = 0.
3975
304 record written!
305 hit_rate 0.6423248882265276
306 ndcg 0.3974651434966728
307 Epoch 33 starts !
308 -----
309 instance loader
310 total loss: 105.98194704949856
311 [Evluating Epoch 33] HR = 0.6602, NDCG = 0.
4057
312 record written!
313 hit_rate 0.6602086438152012
314 ndcg 0.40569863689150837
315 Epoch 34 starts !
316 -----
317 instance loader
318 total loss: 105.82517172396183
```

```
319 [Evluating Epoch 34] HR = 0.6542, NDCG = 0.  
4004  
320 record written!  
321 hit_rate 0.65424739195231  
322 ndcg 0.4003815075465921  
323 Epoch 35 starts !  
324 -----  
-----  
325 instance loader  
326 total loss: 105.47795833647251  
327 [Evluating Epoch 35] HR = 0.6647, NDCG = 0.  
3997  
328 record written!  
329 hit_rate 0.6646795827123696  
330 ndcg 0.39970312797032276  
331 Epoch 36 starts !  
332 -----  
-----  
333 instance loader  
334 total loss: 105.72738052904606  
335 [Evluating Epoch 36] HR = 0.6423, NDCG = 0.  
3975  
336 record written!  
337 hit_rate 0.6423248882265276  
338 ndcg 0.39753062634852576  
339 Epoch 37 starts !  
340 -----  
-----  
341 instance loader  
342 total loss: 105.02932627499104  
343 [Evluating Epoch 37] HR = 0.6692, NDCG = 0.  
4100  
344 record written!  
345 hit_rate 0.669150521609538  
346 ndcg 0.40999581747269076  
347 Epoch 38 starts !  
348 -----
```

```
348 -----
349 instance loader
350 total loss: 105.06646233797073
351 [Evluating Epoch 38] HR = 0.6662, NDCG = 0.
        4133
352 record written!
353 hit_rate 0.6661698956780924
354 ndcg 0.4132656545212462
355 Epoch 39 starts !
356 -----
357 -----
358 instance loader
359 total loss: 105.09123185276985
360 [Evluating Epoch 39] HR = 0.6542, NDCG = 0.
        4061
361 record written!
362 hit_rate 0.65424739195231
363 ndcg 0.40613744042529515
364 Epoch 40 starts !
365 -----
366 instance loader
367 total loss: 105.02445881068707
368 [Evluating Epoch 40] HR = 0.6617, NDCG = 0.
        4093
369 record written!
370 hit_rate 0.6616989567809239
371 ndcg 0.4092788996401366
372 Epoch 41 starts !
373 -----
374 instance loader
375 total loss: 104.65051904320717
376 [Evluating Epoch 41] HR = 0.6662, NDCG = 0.
        4089
377 record written!
378 hit_rate 0.6661698956780924
```

```
378 ndcg 0.4088835057932768
379 Epoch 42 starts !
380 -----
381 instance loader
382 total loss: 104.64308643341064
383 [Evluating Epoch 42] HR = 0.6617, NDCG = 0.
4061
384 record written!
385 hit_rate 0.6616989567809239
386 ndcg 0.40614266598326926
387 Epoch 43 starts !
388 -----
389 instance loader
390 total loss: 104.5388451218605
391 [Evluating Epoch 43] HR = 0.6602, NDCG = 0.
4046
392 record written!
393 hit_rate 0.6602086438152012
394 ndcg 0.4046390120257777
395 Epoch 44 starts !
396 -----
397 instance loader
398 total loss: 104.56002816557884
399 [Evluating Epoch 44] HR = 0.6617, NDCG = 0.
3989
400 record written!
401 hit_rate 0.6616989567809239
402 ndcg 0.39891158202561205
403 Epoch 45 starts !
404 -----
405 instance loader
406 total loss: 104.56779883801937
407 [Evluating Epoch 45] HR = 0.6587, NDCG = 0.
```

```
407 3988
408 record written!
409 hit_rate 0.6587183308494784
410 ndcg 0.3988035808220701
411 Epoch 46 starts !
412 -----
413 instance loader
414 total loss: 104.500990614295
415 [Evluating Epoch 46] HR = 0.6542, NDCG = 0.
4042
416 record written!
417 hit_rate 0.65424739195231
418 ndcg 0.40416358615400716
419 Epoch 47 starts !
420 -----
421 instance loader
422 total loss: 104.28444243967533
423 [Evluating Epoch 47] HR = 0.6483, NDCG = 0.
3995
424 record written!
425 hit_rate 0.6482861400894188
426 ndcg 0.3995152259460158
427 Epoch 48 starts !
428 -----
429 instance loader
430 total loss: 104.18402679264545
431 [Evluating Epoch 48] HR = 0.6542, NDCG = 0.
4021
432 record written!
433 hit_rate 0.65424739195231
434 ndcg 0.40207230318661247
435 Epoch 49 starts !
436 -----
```

```
437 instance loader
438 total loss: 104.32444503903389
439 [Evluating Epoch 49] HR = 0.6528, NDCG = 0.
3998
440 record written!
441 hit_rate 0.6527570789865872
442 ndcg 0.3997860322239509
443 Epoch 50 starts !
444 -----
-----
445 instance loader
446 total loss: 104.29646523296833
447 [Evluating Epoch 50] HR = 0.6557, NDCG = 0.
4083
448 record written!
449 hit_rate 0.6557377049180327
450 ndcg 0.40832069414466377
451 Epoch 51 starts !
452 -----
-----
453 instance loader
454 total loss: 104.29308032989502
455 [Evluating Epoch 51] HR = 0.6632, NDCG = 0.
4029
456 record written!
457 hit_rate 0.6631892697466468
458 ndcg 0.4029248506837663
459 Epoch 52 starts !
460 -----
-----
461 instance loader
462 total loss: 103.89648295938969
463 [Evluating Epoch 52] HR = 0.6438, NDCG = 0.
3964
464 record written!
465 hit_rate 0.6438152011922503
466 ndcg 0.39635935051923177
```

```
467 Epoch 53 starts !
468 -----
469 instance loader
470 total loss: 103.93240469694138
471 [Evaluating Epoch 53] HR = 0.6617, NDCG = 0.
4071
472 record written!
473 hit_rate 0.6616989567809239
474 ndcg 0.4070954729915586
475 Epoch 54 starts !
476 -----
477 instance loader
478 total loss: 104.2027277648449
479 [Evaluating Epoch 54] HR = 0.6602, NDCG = 0.
4096
480 record written!
481 hit_rate 0.6602086438152012
482 ndcg 0.4096205121374901
483 Epoch 55 starts !
484 -----
485 instance loader
486 total loss: 104.07598753273487
487 [Evaluating Epoch 55] HR = 0.6572, NDCG = 0.
4077
488 record written!
489 hit_rate 0.6572280178837556
490 ndcg 0.40767575163120107
491 Epoch 56 starts !
492 -----
493 instance loader
494 total loss: 103.97269941866398
495 [Evaluating Epoch 56] HR = 0.6408, NDCG = 0.
4057
```

```
496 record written!
497 hit_rate 0.6408345752608048
498 ndcg 0.4056581824734123
499 Epoch 57 starts !
500 -----
-----
501 instance loader
502 total loss: 104.03179822862148
503 [Evluating Epoch 57] HR = 0.6617, NDCG = 0.
4042
504 record written!
505 hit_rate 0.6616989567809239
506 ndcg 0.40421795473143174
507 Epoch 58 starts !
508 -----
-----
509 instance loader
510 total loss: 104.03192192316055
511 [Evluating Epoch 58] HR = 0.6483, NDCG = 0.
3935
512 record written!
513 hit_rate 0.6482861400894188
514 ndcg 0.3935378647257379
515 Epoch 59 starts !
516 -----
-----
517 instance loader
518 total loss: 104.006482437253
519 [Evluating Epoch 59] HR = 0.6393, NDCG = 0.
3938
520 record written!
521 hit_rate 0.639344262295082
522 ndcg 0.393769189879689
523 Epoch 60 starts !
524 -----
-----
525 instance loader
```

```
526 total loss: 104.14729723334312
527 [Evluating Epoch 60] HR = 0.6647, NDCG = 0.
      4076
528 record written!
529 hit_rate 0.6646795827123696
530 ndcg 0.4076199905015372
531 Epoch 61 starts !
532 -----
      -----
533 instance loader
534 total loss: 103.75004354119301
535 [Evluating Epoch 61] HR = 0.6557, NDCG = 0.
      4031
536 record written!
537 hit_rate 0.6557377049180327
538 ndcg 0.4031080497254537
539 Epoch 62 starts !
540 -----
      -----
541 instance loader
542 total loss: 103.6402230411768
543 [Evluating Epoch 62] HR = 0.6408, NDCG = 0.
      3922
544 record written!
545 hit_rate 0.6408345752608048
546 ndcg 0.39215348730890687
547 Epoch 63 starts !
548 -----
      -----
549 instance loader
550 total loss: 103.78636246919632
551 [Evluating Epoch 63] HR = 0.6587, NDCG = 0.
      3943
552 record written!
553 hit_rate 0.6587183308494784
554 ndcg 0.3942786933627169
555 Epoch 64 starts !
```

```
556 -----
-----
557 instance loader
558 total loss: 103.68056260049343
559 [Evluating Epoch 64] HR = 0.6602, NDCG = 0.
4057
560 record written!
561 hit_rate 0.6602086438152012
562 ndcg 0.4057333118663299
563 Epoch 65 starts !
564 -----
-----
565 instance loader
566 total loss: 103.63686420023441
567 [Evluating Epoch 65] HR = 0.6468, NDCG = 0.
4140
568 record written!
569 hit_rate 0.646795827123696
570 ndcg 0.41395857104454975
571 Epoch 66 starts !
572 -----
-----
573 instance loader
574 total loss: 103.88558255136013
575 [Evluating Epoch 66] HR = 0.6542, NDCG = 0.
3999
576 record written!
577 hit_rate 0.65424739195231
578 ndcg 0.39993593128110694
579 Epoch 67 starts !
580 -----
-----
581 instance loader
582 total loss: 103.63327726721764
583 [Evluating Epoch 67] HR = 0.6423, NDCG = 0.
3954
584 record written!
```

```
585 hit_rate 0.6423248882265276
586 ndcg 0.39537053178968734
587 Epoch 68 starts !
588 -----
-----
589 instance loader
590 total loss: 103.68813182413578
591 [Evluating Epoch 68] HR = 0.6557, NDCG = 0.
      4068
592 record written!
593 hit_rate 0.6557377049180327
594 ndcg 0.40683630653851977
595 Epoch 69 starts !
596 -----
-----
597 instance loader
598 total loss: 103.32192362844944
599 [Evluating Epoch 69] HR = 0.6587, NDCG = 0.
      3984
600 record written!
601 hit_rate 0.6587183308494784
602 ndcg 0.3983567262382113
603 Epoch 70 starts !
604 -----
-----
605 instance loader
606 total loss: 103.32519325613976
607 [Evluating Epoch 70] HR = 0.6498, NDCG = 0.
      3962
608 record written!
609 hit_rate 0.6497764530551415
610 ndcg 0.3962317443174597
611 Epoch 71 starts !
612 -----
-----
613 instance loader
614 total loss: 103.12272423505783
```

```
615 [Evluating Epoch 71] HR = 0.6468, NDCG = 0.  
4016  
616 record written!  
617 hit_rate 0.646795827123696  
618 ndcg 0.4016118626366941  
619 Epoch 72 starts !  
620 -----  
-----  
621 instance loader  
622 total loss: 103.3112815618515  
623 [Evluating Epoch 72] HR = 0.6349, NDCG = 0.  
4002  
624 record written!  
625 hit_rate 0.6348733233979136  
626 ndcg 0.4001871899054335  
627 Epoch 73 starts !  
628 -----  
-----  
629 instance loader  
630 total loss: 103.18028585612774  
631 [Evluating Epoch 73] HR = 0.6647, NDCG = 0.  
4149  
632 record written!  
633 hit_rate 0.6646795827123696  
634 ndcg 0.41493176996383296  
635 Epoch 74 starts !  
636 -----  
-----  
637 instance loader  
638 total loss: 103.48436729609966  
639 [Evluating Epoch 74] HR = 0.6617, NDCG = 0.  
4100  
640 record written!  
641 hit_rate 0.6616989567809239  
642 ndcg 0.4100292781164874  
643 Epoch 75 starts !  
644 -----
```

```
644 -----
645 instance loader
646 total loss: 103.30306865274906
647 [Evluating Epoch 75] HR = 0.6468, NDCG = 0.
648   4015
649 record written!
650 hit_rate 0.646795827123696
651 ndcg 0.4015270435312242
652 Epoch 76 starts !
653 -----
654 instance loader
655 total loss: 103.19990712404251
656 [Evluating Epoch 76] HR = 0.6498, NDCG = 0.
657   4072
658 record written!
659 hit_rate 0.6497764530551415
660 ndcg 0.4071946427650193
661 Epoch 77 starts !
662 -----
663 instance loader
664 total loss: 103.21002167463303
665 [Evluating Epoch 77] HR = 0.6632, NDCG = 0.
666   4108
667 record written!
668 hit_rate 0.6631892697466468
669 ndcg 0.41077908696354065
670 Epoch 78 starts !
671 -----
672 instance loader
673 total loss: 102.97092545032501
674 [Evluating Epoch 78] HR = 0.6572, NDCG = 0.
675   4103
676 record written!
677 hit_rate 0.6572280178837556
```

```
674 ndcg 0.41028328475978293
675 Epoch 79 starts !
676 -----
677 instance loader
678 total loss: 103.02820818126202
679 [Evluating Epoch 79] HR = 0.6423, NDCG = 0.
3998
680 record written!
681 hit_rate 0.6423248882265276
682 ndcg 0.3998089182307701
683 Epoch 80 starts !
684 -----
685 instance loader
686 total loss: 103.12259608507156
687 [Evluating Epoch 80] HR = 0.6572, NDCG = 0.
4058
688 record written!
689 hit_rate 0.6572280178837556
690 ndcg 0.40582407345723687
691 Epoch 81 starts !
692 -----
693 instance loader
694 total loss: 102.88404113054276
695 [Evluating Epoch 81] HR = 0.6453, NDCG = 0.
3970
696 record written!
697 hit_rate 0.6453055141579732
698 ndcg 0.3970359328476422
699 Epoch 82 starts !
700 -----
701 instance loader
702 total loss: 103.17762570083141
703 [Evluating Epoch 82] HR = 0.6542, NDCG = 0.
```

```
703 4040
704 record written!
705 hit_rate 0.65424739195231
706 ndcg 0.40402192599330294
707 Epoch 83 starts !
708 -----
-----
709 instance loader
710 total loss: 103.00388732552528
711 [Evluating Epoch 83] HR = 0.6528, NDCG = 0.
    4104
712 record written!
713 hit_rate 0.6527570789865872
714 ndcg 0.4104233582715798
715 Epoch 84 starts !
716 -----
-----
717 instance loader
718 total loss: 102.91785730421543
719 [Evluating Epoch 84] HR = 0.6438, NDCG = 0.
    3989
720 record written!
721 hit_rate 0.6438152011922503
722 ndcg 0.39893921697852713
723 Epoch 85 starts !
724 -----
-----
725 instance loader
726 total loss: 102.71740305423737
727 [Evluating Epoch 85] HR = 0.6423, NDCG = 0.
    3982
728 record written!
729 hit_rate 0.6423248882265276
730 ndcg 0.39815783019057416
731 Epoch 86 starts !
732 -----
```

```
733 instance loader
734 total loss: 102.70971707999706
735 [Evluating Epoch 86] HR = 0.6483, NDCG = 0.
    4124
736 record written!
737 hit_rate 0.6482861400894188
738 ndcg 0.412415076558763
739 Epoch 87 starts !
740 -----
-----
741 instance loader
742 total loss: 103.04033041000366
743 [Evluating Epoch 87] HR = 0.6602, NDCG = 0.
    4100
744 record written!
745 hit_rate 0.6602086438152012
746 ndcg 0.4100361136047964
747 Epoch 88 starts !
748 -----
-----
749 instance loader
750 total loss: 102.98417384922504
751 [Evluating Epoch 88] HR = 0.6751, NDCG = 0.
    4122
752 record written!
753 hit_rate 0.6751117734724292
754 ndcg 0.41221450236198454
755 Epoch 89 starts !
756 -----
-----
757 instance loader
758 total loss: 102.86745554208755
759 [Evluating Epoch 89] HR = 0.6542, NDCG = 0.
    3993
760 record written!
761 hit_rate 0.65424739195231
762 ndcg 0.39930081262977385
```

```
763 Epoch 90 starts !
764 -----
765 instance loader
766 total loss: 102.75256398320198
767 [Evaluating Epoch 90] HR = 0.6304, NDCG = 0.
    3908
768 record written!
769 hit_rate 0.6304023845007451
770 ndcg 0.3907616135086057
771 Epoch 91 starts !
772 -----
773 instance loader
774 total loss: 102.8231647759676
775 [Evaluating Epoch 91] HR = 0.6528, NDCG = 0.
    3972
776 record written!
777 hit_rate 0.6527570789865872
778 ndcg 0.3971996992606635
779 Epoch 92 starts !
780 -----
781 instance loader
782 total loss: 102.74533778429031
783 [Evaluating Epoch 92] HR = 0.6602, NDCG = 0.
    3939
784 record written!
785 hit_rate 0.6602086438152012
786 ndcg 0.3938846651369625
787 Epoch 93 starts !
788 -----
789 instance loader
790 total loss: 102.7282330840826
791 [Evaluating Epoch 93] HR = 0.6602, NDCG = 0.
    4043
```

```
792 record written!
793 hit_rate 0.6602086438152012
794 ndcg 0.40425337409019096
795 Epoch 94 starts !
796 -----
-----
797 instance loader
798 total loss: 103.06131590902805
799 [Evluating Epoch 94] HR = 0.6498, NDCG = 0.
    4006
800 record written!
801 hit_rate 0.6497764530551415
802 ndcg 0.40064284957517443
803 Epoch 95 starts !
804 -----
-----
805 instance loader
806 total loss: 102.99514459073544
807 [Evluating Epoch 95] HR = 0.6542, NDCG = 0.
    3964
808 record written!
809 hit_rate 0.65424739195231
810 ndcg 0.39635960743403564
811 Epoch 96 starts !
812 -----
-----
813 instance loader
814 total loss: 102.60517571866512
815 [Evluating Epoch 96] HR = 0.6319, NDCG = 0.
    3956
816 record written!
817 hit_rate 0.6318926974664679
818 ndcg 0.3955767821754439
819 Epoch 97 starts !
820 -----
-----
821 instance loader
```

```
822 total loss: 102.71487839519978
823 [Evluating Epoch 97] HR = 0.6528, NDCG = 0.
     3937
824 record written!
825 hit_rate 0.6527570789865872
826 ndcg 0.3936872646661372
827 Epoch 98 starts !
828 -----
-----
829 instance loader
830 total loss: 102.8235783725977
831 [Evluating Epoch 98] HR = 0.6617, NDCG = 0.
     4060
832 record written!
833 hit_rate 0.6616989567809239
834 ndcg 0.40599881282860395
835 Epoch 99 starts !
836 -----
-----
837 instance loader
838 total loss: 102.63625779747963
839 [Evluating Epoch 99] HR = 0.6423, NDCG = 0.
     3975
840 record written!
841 hit_rate 0.6423248882265276
842 ndcg 0.39748180077989487
843 Epoch 100 starts !
844 -----
-----
845 instance loader
846 total loss: 102.42436364293098
847 [Evluating Epoch 100] HR = 0.6498, NDCG = 0.
     3978
848 record written!
849 hit_rate 0.6497764530551415
850 ndcg 0.39776698862044213
851 Epoch 101 starts !
```

```
852 -----
-----
853 instance loader
854 total loss: 102.54080139100552
855 [Evluating Epoch 101] HR = 0.6498, NDCG = 0.
3994
856 record written!
857 hit_rate 0.6497764530551415
858 ndcg 0.3993512629258008
859 Epoch 102 starts !
860 -----
-----
861 instance loader
862 total loss: 102.64861665666103
863 [Evluating Epoch 102] HR = 0.6498, NDCG = 0.
4036
864 record written!
865 hit_rate 0.6497764530551415
866 ndcg 0.40357259413320845
867 Epoch 103 starts !
868 -----
-----
869 instance loader
870 total loss: 102.40288762748241
871 [Evluating Epoch 103] HR = 0.6423, NDCG = 0.
3972
872 record written!
873 hit_rate 0.6423248882265276
874 ndcg 0.39718265403605196
875 Epoch 104 starts !
876 -----
-----
877 instance loader
878 total loss: 102.5600503385067
879 [Evluating Epoch 104] HR = 0.6513, NDCG = 0.
4046
880 record written!
```

```
881 hit_rate 0.6512667660208644
882 ndcg 0.4045624847335799
883 Epoch 105 starts !
884 -----
-----
885 instance loader
886 total loss: 102.60926678776741
887 [Evluating Epoch 105] HR = 0.6423, NDCG = 0.
4072
888 record written!
889 hit_rate 0.6423248882265276
890 ndcg 0.4071961478194508
891 Epoch 106 starts !
892 -----
-----
893 instance loader
894 total loss: 102.72279228270054
895 [Evluating Epoch 106] HR = 0.6647, NDCG = 0.
4154
896 record written!
897 hit_rate 0.6646795827123696
898 ndcg 0.41537535702058476
899 Epoch 107 starts !
900 -----
-----
901 instance loader
902 total loss: 102.5641687810421
903 [Evluating Epoch 107] HR = 0.6602, NDCG = 0.
4030
904 record written!
905 hit_rate 0.6602086438152012
906 ndcg 0.40303210222912744
907 Epoch 108 starts !
908 -----
-----
909 instance loader
910 total loss: 102.43890281021595
```

```
911 [Evluating Epoch 108] HR = 0.6379, NDCG = 0.  
4038  
912 record written!  
913 hit_rate 0.6378539493293591  
914 ndcg 0.40379382110472  
915 Epoch 109 starts !  
916 -----  
-----  
917 instance loader  
918 total loss: 102.46053846180439  
919 [Evluating Epoch 109] HR = 0.6438, NDCG = 0.  
4014  
920 record written!  
921 hit_rate 0.6438152011922503  
922 ndcg 0.4013793378009852  
923 Epoch 110 starts !  
924 -----  
-----  
925 instance loader  
926 total loss: 102.57213298976421  
927 [Evluating Epoch 110] HR = 0.6632, NDCG = 0.  
4060  
928 record written!  
929 hit_rate 0.6631892697466468  
930 ndcg 0.40596913635530185  
931 Epoch 111 starts !  
932 -----  
-----  
933 instance loader  
934 total loss: 102.62263940274715  
935 [Evluating Epoch 111] HR = 0.6662, NDCG = 0.  
4165  
936 record written!  
937 hit_rate 0.6661698956780924  
938 ndcg 0.41648608546567706  
939 Epoch 112 starts !  
940 -----
```

```
940 -----
941 instance loader
942 total loss: 102.6574104577303
943 [Evluating Epoch 112] HR = 0.6587, NDCG = 0.
944 3942
945 record written!
946 hit_rate 0.6587183308494784
947 ndcg 0.39420273579462295
948 Epoch 113 starts !
949 -----
950 -----
951 instance loader
952 total loss: 102.78145626187325
953 [Evluating Epoch 113] HR = 0.6528, NDCG = 0.
954 4060
955 record written!
956 hit_rate 0.6527570789865872
957 ndcg 0.40601998096080094
958 Epoch 114 starts !
959 -----
960 instance loader
961 total loss: 102.39185054600239
962 [Evluating Epoch 114] HR = 0.6393, NDCG = 0.
963 4050
964 record written!
965 hit_rate 0.639344262295082
966 ndcg 0.40496132841660315
967 Epoch 115 starts !
968 -----
969 instance loader
970 total loss: 102.31244575977325
971 [Evluating Epoch 115] HR = 0.6423, NDCG = 0.
972 3999
973 record written!
974 hit_rate 0.6423248882265276
```

```
970 ndcg 0.39985249436598486
971 Epoch 116 starts !
972 -----
973 instance loader
974 total loss: 102.43352127075195
975 [Evluating Epoch 116] HR = 0.6393, NDCG = 0.
976 record written!
977 hit_rate 0.639344262295082
978 ndcg 0.391088172420426
979 Epoch 117 starts !
980 -----
981 instance loader
982 total loss: 102.37413819134235
983 [Evluating Epoch 117] HR = 0.6617, NDCG = 0.
984 record written!
985 hit_rate 0.6616989567809239
986 ndcg 0.40294336885843485
987 Epoch 118 starts !
988 -----
989 instance loader
990 total loss: 102.58272840082645
991 [Evluating Epoch 118] HR = 0.6587, NDCG = 0.
992 record written!
993 hit_rate 0.6587183308494784
994 ndcg 0.39800769827890065
995 Epoch 119 starts !
996 -----
997 instance loader
998 total loss: 102.23406694829464
999 [Evluating Epoch 119] HR = 0.6408, NDCG = 0.
```

```
999 3955
1000 record written!
1001 hit_rate 0.6408345752608048
1002 ndcg 0.3954772432574254
1003 Epoch 120 starts !
1004 -----
-----
1005 instance loader
1006 total loss: 102.44847200810909
1007 [Evluating Epoch 120] HR = 0.6379, NDCG = 0.
3943
1008 record written!
1009 hit_rate 0.6378539493293591
1010 ndcg 0.39433832370495736
1011 Epoch 121 starts !
1012 -----
-----
1013 instance loader
1014 total loss: 102.3731994330883
1015 [Evluating Epoch 121] HR = 0.6513, NDCG = 0.
4022
1016 record written!
1017 hit_rate 0.6512667660208644
1018 ndcg 0.4021733600734392
1019 Epoch 122 starts !
1020 -----
-----
1021 instance loader
1022 total loss: 102.36928215622902
1023 [Evluating Epoch 122] HR = 0.6274, NDCG = 0.
3879
1024 record written!
1025 hit_rate 0.6274217585692996
1026 ndcg 0.38792906370021074
1027 Epoch 123 starts !
1028 -----
```

```
1029 instance loader
1030 total loss: 102.44922041893005
1031 [Evluating Epoch 123] HR = 0.6453, NDCG = 0.
        4012
1032 record written!
1033 hit_rate 0.6453055141579732
1034 ndcg 0.401195920159525
1035 Epoch 124 starts !
1036 -----
        -----
1037 instance loader
1038 total loss: 102.4194333255291
1039 [Evluating Epoch 124] HR = 0.6334, NDCG = 0.
        3973
1040 record written!
1041 hit_rate 0.6333830104321908
1042 ndcg 0.39733160015144026
1043 Epoch 125 starts !
1044 -----
        -----
1045 instance loader
1046 total loss: 102.3620889633894
1047 [Evluating Epoch 125] HR = 0.6587, NDCG = 0.
        3955
1048 record written!
1049 hit_rate 0.6587183308494784
1050 ndcg 0.39547915356269653
1051 Epoch 126 starts !
1052 -----
        -----
1053 instance loader
1054 total loss: 102.1149542182684
1055 [Evluating Epoch 126] HR = 0.6483, NDCG = 0.
        4039
1056 record written!
1057 hit_rate 0.6482861400894188
1058 ndcg 0.40387917001394047
```

```
1059 Epoch 127 starts !
1060 -----
1061 instance loader
1062 total loss: 102.53107185661793
1063 [Evluating Epoch 127] HR = 0.6468, NDCG = 0.
1064 record written!
1065 hit_rate 0.646795827123696
1066 ndcg 0.39940118735342817
1067 Epoch 128 starts !
1068 -----
1069 instance loader
1070 total loss: 102.17229209840298
1071 [Evluating Epoch 128] HR = 0.6557, NDCG = 0.
1072 record written!
1073 hit_rate 0.6557377049180327
1074 ndcg 0.4069424231235686
1075 Epoch 129 starts !
1076 -----
1077 instance loader
1078 total loss: 102.3692294061184
1079 [Evluating Epoch 129] HR = 0.6692, NDCG = 0.
1080 record written!
1081 hit_rate 0.669150521609538
1082 ndcg 0.40247071827714004
1083 Epoch 130 starts !
1084 -----
1085 instance loader
1086 total loss: 102.2501208037138
1087 [Evluating Epoch 130] HR = 0.6557, NDCG = 0.
1088 4007
```

```
1088 record written!
1089 hit_rate 0.6557377049180327
1090 ndcg 0.40067019225980194
1091 Epoch 131 starts !
1092 -----
1093 instance loader
1094 total loss: 102.03609350323677
1095 [Evluating Epoch 131] HR = 0.6289, NDCG = 0.
3927
1096 record written!
1097 hit_rate 0.6289120715350224
1098 ndcg 0.39270236375200746
1099 Epoch 132 starts !
1100 -----
1101 instance loader
1102 total loss: 102.3852039128542
1103 [Evluating Epoch 132] HR = 0.6587, NDCG = 0.
4097
1104 record written!
1105 hit_rate 0.6587183308494784
1106 ndcg 0.40968119041257095
1107 Epoch 133 starts !
1108 -----
1109 instance loader
1110 total loss: 102.33615055680275
1111 [Evluating Epoch 133] HR = 0.6617, NDCG = 0.
4008
1112 record written!
1113 hit_rate 0.6616989567809239
1114 ndcg 0.4008373305089084
1115 Epoch 134 starts !
1116 -----
1117 instance loader
```

```
1118 total loss: 102.18280109763145
1119 [Evluating Epoch 134] HR = 0.6379, NDCG = 0.
     3897
1120 record written!
1121 hit_rate 0.6378539493293591
1122 ndcg 0.38965969142384516
1123 Epoch 135 starts !
1124 -----
1125 instance loader
1126 total loss: 102.25833840668201
1127 [Evluating Epoch 135] HR = 0.6483, NDCG = 0.
     3934
1128 record written!
1129 hit_rate 0.6482861400894188
1130 ndcg 0.3933992915916174
1131 Epoch 136 starts !
1132 -----
1133 instance loader
1134 total loss: 102.2706101089716
1135 [Evluating Epoch 136] HR = 0.6379, NDCG = 0.
     3883
1136 record written!
1137 hit_rate 0.6378539493293591
1138 ndcg 0.3883016004205409
1139 Epoch 137 starts !
1140 -----
1141 instance loader
1142 total loss: 102.22928731143475
1143 [Evluating Epoch 137] HR = 0.6513, NDCG = 0.
     3941
1144 record written!
1145 hit_rate 0.6512667660208644
1146 ndcg 0.39409311301956756
1147 Epoch 138 starts !
```

```
1148 -----
-----
1149 instance loader
1150 total loss: 102.2140553444624
1151 [Evluating Epoch 138] HR = 0.6468, NDCG = 0.
        4032
1152 record written!
1153 hit_rate 0.646795827123696
1154 ndcg 0.4032482085930303
1155 Epoch 139 starts !
1156 -----
-----
1157 instance loader
1158 total loss: 102.46866174042225
1159 [Evluating Epoch 139] HR = 0.6379, NDCG = 0.
        3916
1160 record written!
1161 hit_rate 0.6378539493293591
1162 ndcg 0.39164743689023745
1163 Epoch 140 starts !
1164 -----
-----
1165 instance loader
1166 total loss: 102.64975680410862
1167 [Evluating Epoch 140] HR = 0.6364, NDCG = 0.
        3979
1168 record written!
1169 hit_rate 0.6363636363636364
1170 ndcg 0.3979452185588938
1171 Epoch 141 starts !
1172 -----
-----
1173 instance loader
1174 total loss: 102.20785439014435
1175 [Evluating Epoch 141] HR = 0.6453, NDCG = 0.
        4074
1176 record written!
```

```
1177 hit_rate 0.6453055141579732
1178 ndcg 0.40741893265201207
1179 Epoch 142 starts !
1180 -----
1181 instance loader
1182 total loss: 102.16135868430138
1183 [Evluating Epoch 142] HR = 0.6379, NDCG = 0.
1184 record written!
1185 hit_rate 0.6378539493293591
1186 ndcg 0.4122672421913163
1187 Epoch 143 starts !
1188 -----
1189 instance loader
1190 total loss: 102.05166049301624
1191 [Evluating Epoch 143] HR = 0.6498, NDCG = 0.
1192 record written!
1193 hit_rate 0.6497764530551415
1194 ndcg 0.39846371555799087
1195 Epoch 144 starts !
1196 -----
1197 instance loader
1198 total loss: 102.32475271821022
1199 [Evluating Epoch 144] HR = 0.6513, NDCG = 0.
1200 record written!
1201 hit_rate 0.6512667660208644
1202 ndcg 0.39859953489679156
1203 Epoch 145 starts !
1204 -----
1205 instance loader
1206 total loss: 101.84606865048409
```

```
1207 [Evluating Epoch 145] HR = 0.6468, NDCG = 0.  
3956  
1208 record written!  
1209 hit_rate 0.646795827123696  
1210 ndcg 0.39561113144698673  
1211 Epoch 146 starts !  
1212 -----  
-----  
1213 instance loader  
1214 total loss: 101.92735746502876  
1215 [Evluating Epoch 146] HR = 0.6393, NDCG = 0.  
3922  
1216 record written!  
1217 hit_rate 0.639344262295082  
1218 ndcg 0.3921529843338283  
1219 Epoch 147 starts !  
1220 -----  
-----  
1221 instance loader  
1222 total loss: 102.04743747413158  
1223 [Evluating Epoch 147] HR = 0.6334, NDCG = 0.  
3944  
1224 record written!  
1225 hit_rate 0.6333830104321908  
1226 ndcg 0.394391268504719  
1227 Epoch 148 starts !  
1228 -----  
-----  
1229 instance loader  
1230 total loss: 102.16241164505482  
1231 [Evluating Epoch 148] HR = 0.6453, NDCG = 0.  
3973  
1232 record written!  
1233 hit_rate 0.6453055141579732  
1234 ndcg 0.3972916649265061  
1235 Epoch 149 starts !  
1236 -----
```

```
1236 -----
1237 instance loader
1238 total loss: 102.08134812116623
1239 [Evluating Epoch 149] HR = 0.6498, NDCG = 0.
1240   3961
1241 record written!
1242 hit_rate 0.6497764530551415
1243 ndcg 0.39612079574202247
1244 Epoch 150 starts !
1245 -----
1246 -----
1247 instance loader
1248 total loss: 101.82698586583138
1249 [Evluating Epoch 150] HR = 0.6453, NDCG = 0.
1250   3934
1251 record written!
1252 hit_rate 0.6453055141579732
1253 ndcg 0.39341250143023887
1254 Epoch 151 starts !
1255 -----
1256 instance loader
1257 total loss: 102.12500128149986
1258 [Evluating Epoch 151] HR = 0.6408, NDCG = 0.
1259   3988
1260 record written!
1261 hit_rate 0.6408345752608048
1262 ndcg 0.398791006074244
1263 Epoch 152 starts !
1264 -----
1265 instance loader
1266 total loss: 101.89010201394558
1267 [Evluating Epoch 152] HR = 0.6766, NDCG = 0.
1268   4160
1269 record written!
1270 hit_rate 0.676602086438152
```

```
1266 ndcg 0.41595305680437195
1267 Epoch 153 starts !
1268 -----
1269 instance loader
1270 total loss: 102.14581200480461
1271 [Evluating Epoch 153] HR = 0.6528, NDCG = 0.
        4083
1272 record written!
1273 hit_rate 0.6527570789865872
1274 ndcg 0.40830491929240886
1275 Epoch 154 starts !
1276 -----
1277 instance loader
1278 total loss: 102.11910386383533
1279 [Evluating Epoch 154] HR = 0.6498, NDCG = 0.
        4105
1280 record written!
1281 hit_rate 0.6497764530551415
1282 ndcg 0.4105267642778451
1283 Epoch 155 starts !
1284 -----
1285 instance loader
1286 total loss: 101.98651273548603
1287 [Evluating Epoch 155] HR = 0.6304, NDCG = 0.
        3953
1288 record written!
1289 hit_rate 0.6304023845007451
1290 ndcg 0.3953391443261762
1291 Epoch 156 starts !
1292 -----
1293 instance loader
1294 total loss: 101.76831158995628
1295 [Evluating Epoch 156] HR = 0.6453, NDCG = 0.
```

```
1295 3956
1296 record written!
1297 hit_rate 0.6453055141579732
1298 ndcg 0.39562263454742624
1299 Epoch 157 starts !
1300 -----
-----
1301 instance loader
1302 total loss: 102.03845648467541
1303 [Evluating Epoch 157] HR = 0.6587, NDCG = 0.
4047
1304 record written!
1305 hit_rate 0.6587183308494784
1306 ndcg 0.40472436236362724
1307 Epoch 158 starts !
1308 -----
-----
1309 instance loader
1310 total loss: 102.17809402942657
1311 [Evluating Epoch 158] HR = 0.6587, NDCG = 0.
4036
1312 record written!
1313 hit_rate 0.6587183308494784
1314 ndcg 0.4036131676836516
1315 Epoch 159 starts !
1316 -----
-----
1317 instance loader
1318 total loss: 101.97839558124542
1319 [Evluating Epoch 159] HR = 0.6617, NDCG = 0.
3985
1320 record written!
1321 hit_rate 0.6616989567809239
1322 ndcg 0.39852604289987664
1323 Epoch 160 starts !
1324 -----
```

```
1325 instance loader
1326 total loss: 101.90947014093399
1327 [Evluating Epoch 160] HR = 0.6468, NDCG = 0.
        4039
1328 record written!
1329 hit_rate 0.646795827123696
1330 ndcg 0.40385266662148794
1331 Epoch 161 starts !
1332 -----
1333 instance loader
1334 total loss: 101.94926480948925
1335 [Evluating Epoch 161] HR = 0.6587, NDCG = 0.
        4101
1336 record written!
1337 hit_rate 0.6587183308494784
1338 ndcg 0.41009249304705164
1339 Epoch 162 starts !
1340 -----
1341 instance loader
1342 total loss: 101.91613240540028
1343 [Evluating Epoch 162] HR = 0.6498, NDCG = 0.
        3882
1344 record written!
1345 hit_rate 0.6497764530551415
1346 ndcg 0.38820348798445536
1347 Epoch 163 starts !
1348 -----
1349 instance loader
1350 total loss: 101.77500522136688
1351 [Evluating Epoch 163] HR = 0.6602, NDCG = 0.
        4010
1352 record written!
1353 hit_rate 0.6602086438152012
1354 ndcg 0.40098138605909167
```

```
1355 Epoch 164 starts !
1356 -----
1357 instance loader
1358 total loss: 102.08655413985252
1359 [Evluating Epoch 164] HR = 0.6542, NDCG = 0.
        4034
1360 record written!
1361 hit_rate 0.65424739195231
1362 ndcg 0.4033770203791374
1363 Epoch 165 starts !
1364 -----
1365 instance loader
1366 total loss: 101.86407260596752
1367 [Evluating Epoch 165] HR = 0.6662, NDCG = 0.
        3958
1368 record written!
1369 hit_rate 0.6661698956780924
1370 ndcg 0.3957683130487835
1371 Epoch 166 starts !
1372 -----
1373 instance loader
1374 total loss: 102.15187340974808
1375 [Evluating Epoch 166] HR = 0.6393, NDCG = 0.
        4042
1376 record written!
1377 hit_rate 0.639344262295082
1378 ndcg 0.4042094643271062
1379 Epoch 167 starts !
1380 -----
1381 instance loader
1382 total loss: 101.88739721477032
1383 [Evluating Epoch 167] HR = 0.6453, NDCG = 0.
        3986
```

```
1384 record written!
1385 hit_rate 0.6453055141579732
1386 ndcg 0.398566450387618
1387 Epoch 168 starts !
1388 -----
1389 instance loader
1390 total loss: 102.07947538793087
1391 [Evluating Epoch 168] HR = 0.6468, NDCG = 0.
1392 record written!
1393 hit_rate 0.646795827123696
1394 ndcg 0.3983850911448792
1395 Epoch 169 starts !
1396 -----
1397 instance loader
1398 total loss: 102.3025540560484
1399 [Evluating Epoch 169] HR = 0.6617, NDCG = 0.
1400 record written!
1401 hit_rate 0.6616989567809239
1402 ndcg 0.4036536624475034
1403 Epoch 170 starts !
1404 -----
1405 instance loader
1406 total loss: 102.01926617324352
1407 [Evluating Epoch 170] HR = 0.6528, NDCG = 0.
1408 record written!
1409 hit_rate 0.6527570789865872
1410 ndcg 0.4009162324578837
1411 Epoch 171 starts !
1412 -----
1413 instance loader
```

```
1414 total loss: 101.8885078728199
1415 [Evluating Epoch 171] HR = 0.6572, NDCG = 0.
        4046
1416 record written!
1417 hit_rate 0.6572280178837556
1418 ndcg 0.40463386419058545
1419 Epoch 172 starts !
1420 -----
        -----
1421 instance loader
1422 total loss: 101.73927488923073
1423 [Evluating Epoch 172] HR = 0.6602, NDCG = 0.
        4042
1424 record written!
1425 hit_rate 0.6602086438152012
1426 ndcg 0.4041939675363917
1427 Epoch 173 starts !
1428 -----
        -----
1429 instance loader
1430 total loss: 101.93370532989502
1431 [Evluating Epoch 173] HR = 0.6572, NDCG = 0.
        4025
1432 record written!
1433 hit_rate 0.6572280178837556
1434 ndcg 0.40252964742137737
1435 Epoch 174 starts !
1436 -----
        -----
1437 instance loader
1438 total loss: 102.09516236186028
1439 [Evluating Epoch 174] HR = 0.6498, NDCG = 0.
        3943
1440 record written!
1441 hit_rate 0.6497764530551415
1442 ndcg 0.39433057994698634
1443 Epoch 175 starts !
```

```
1444 -----
-----
1445 instance loader
1446 total loss: 101.96208064258099
1447 [Evluating Epoch 175] HR = 0.6528, NDCG = 0.
4024
1448 record written!
1449 hit_rate 0.6527570789865872
1450 ndcg 0.40238319255679594
1451 Epoch 176 starts !
1452 -----
-----
1453 instance loader
1454 total loss: 101.84222826361656
1455 [Evluating Epoch 176] HR = 0.6259, NDCG = 0.
3862
1456 record written!
1457 hit_rate 0.6259314456035767
1458 ndcg 0.3862312574911704
1459 Epoch 177 starts !
1460 -----
-----
1461 instance loader
1462 total loss: 101.9512465596199
1463 [Evluating Epoch 177] HR = 0.6379, NDCG = 0.
3920
1464 record written!
1465 hit_rate 0.6378539493293591
1466 ndcg 0.3919714472977378
1467 Epoch 178 starts !
1468 -----
-----
1469 instance loader
1470 total loss: 101.9805351048708
1471 [Evluating Epoch 178] HR = 0.6468, NDCG = 0.
4047
1472 record written!
```

```
1473 hit_rate 0.646795827123696
1474 ndcg 0.40470748325885303
1475 Epoch 179 starts !
1476 -----
1477 instance loader
1478 total loss: 101.98940266668797
1479 [Evluating Epoch 179] HR = 0.6379, NDCG = 0.
1480 3914
1481 record written!
1482 hit_rate 0.6378539493293591
1483 ndcg 0.3914079781747213
1484 Epoch 180 starts !
1485 -----
1486 instance loader
1487 total loss: 101.91108341515064
1488 [Evluating Epoch 180] HR = 0.6587, NDCG = 0.
1489 3985
1490 record written!
1491 hit_rate 0.6587183308494784
1492 ndcg 0.3984895319254562
1493 Epoch 181 starts !
1494 -----
1495 instance loader
1496 total loss: 101.92061001062393
1497 [Evluating Epoch 181] HR = 0.6423, NDCG = 0.
1498 3920
1499 record written!
1500 hit_rate 0.6423248882265276
1501 ndcg 0.3920479480408896
1502 Epoch 182 starts !
1503 -----
1504 instance loader
1505 total loss: 101.73978359997272
```

```
1503 [Evluating Epoch 182] HR = 0.6468, NDCG = 0.  
3965  
1504 record written!  
1505 hit_rate 0.646795827123696  
1506 ndcg 0.3965169265508427  
1507 Epoch 183 starts !  
1508 -----  
-----  
1509 instance loader  
1510 total loss: 102.10397478938103  
1511 [Evluating Epoch 183] HR = 0.6334, NDCG = 0.  
3949  
1512 record written!  
1513 hit_rate 0.6333830104321908  
1514 ndcg 0.3948853160108927  
1515 Epoch 184 starts !  
1516 -----  
-----  
1517 instance loader  
1518 total loss: 101.88073396682739  
1519 [Evluating Epoch 184] HR = 0.6349, NDCG = 0.  
3943  
1520 record written!  
1521 hit_rate 0.6348733233979136  
1522 ndcg 0.39426896836933417  
1523 Epoch 185 starts !  
1524 -----  
-----  
1525 instance loader  
1526 total loss: 102.02794167399406  
1527 [Evluating Epoch 185] HR = 0.6453, NDCG = 0.  
3935  
1528 record written!  
1529 hit_rate 0.6453055141579732  
1530 ndcg 0.3934887704582727  
1531 Epoch 186 starts !  
1532 -----
```

```
1532 -----
1533 instance loader
1534 total loss: 101.80081088840961
1535 [Evluating Epoch 186] HR = 0.6289, NDCG = 0.
1536 record written!
1537 hit_rate 0.6289120715350224
1538 ndcg 0.3915764679546321
1539 Epoch 187 starts !
1540 -----
1541 -----
1542 -----
1543 -----
1544 -----
1545 -----
1546 -----
1547 -----
1548 -----
1549 -----
1550 -----
1551 -----
1552 -----
1553 -----
1554 -----
1555 -----
1556 -----
1557 -----
1558 -----
1559 -----
1560 -----
1561 -----
```

```
1562 ndcg 0.40763494447298754
1563 Epoch 190 starts !
1564 -----
1565 instance loader
1566 total loss: 101.73206368088722
1567 [Evluating Epoch 190] HR = 0.6319, NDCG = 0.
1568 record written!
1569 hit_rate 0.6318926974664679
1570 ndcg 0.38897072818917505
1571 Epoch 191 starts !
1572 -----
1573 instance loader
1574 total loss: 101.73255524039268
1575 [Evluating Epoch 191] HR = 0.6483, NDCG = 0.
1576 record written!
1577 hit_rate 0.6482861400894188
1578 ndcg 0.3943647662039268
1579 Epoch 192 starts !
1580 -----
1581 instance loader
1582 total loss: 101.53359144926071
1583 [Evluating Epoch 192] HR = 0.6393, NDCG = 0.
1584 record written!
1585 hit_rate 0.639344262295082
1586 ndcg 0.3994843109352632
1587 Epoch 193 starts !
1588 -----
1589 instance loader
1590 total loss: 101.75444324314594
1591 [Evluating Epoch 193] HR = 0.6423, NDCG = 0.
```

```
1591 3958
1592 record written!
1593 hit_rate 0.6423248882265276
1594 ndcg 0.3958411686544014
1595 Epoch 194 starts !
1596 -----
1597 instance loader
1598 total loss: 101.9278561770916
1599 [Evluating Epoch 194] HR = 0.6513, NDCG = 0.
3920
1600 record written!
1601 hit_rate 0.6512667660208644
1602 ndcg 0.3919905673542581
1603 Epoch 195 starts !
1604 -----
1605 instance loader
1606 total loss: 101.80521248281002
1607 [Evluating Epoch 195] HR = 0.6319, NDCG = 0.
3886
1608 record written!
1609 hit_rate 0.6318926974664679
1610 ndcg 0.3886134396181869
1611 Epoch 196 starts !
1612 -----
1613 instance loader
1614 total loss: 101.83047518134117
1615 [Evluating Epoch 196] HR = 0.6408, NDCG = 0.
3938
1616 record written!
1617 hit_rate 0.6408345752608048
1618 ndcg 0.3937811201458396
1619 Epoch 197 starts !
1620 -----
```

```
1621 instance loader
1622 total loss: 101.64632973074913
1623 [Evluating Epoch 197] HR = 0.6572, NDCG = 0.
        4029
1624 record written!
1625 hit_rate 0.6572280178837556
1626 ndcg 0.40285724502073533
1627 Epoch 198 starts !
1628 -----
1629 instance loader
1630 total loss: 101.76940283179283
1631 [Evluating Epoch 198] HR = 0.6393, NDCG = 0.
        4037
1632 record written!
1633 hit_rate 0.639344262295082
1634 ndcg 0.4037440666004568
1635 Epoch 199 starts !
1636 -----
1637 instance loader
1638 total loss: 101.7405159175396
1639 [Evluating Epoch 199] HR = 0.6662, NDCG = 0.
        4151
1640 record written!
1641 hit_rate 0.6661698956780924
1642 ndcg 0.4151442203677239
1643 In[3]: neumf_config
1644 Out[3]:
1645 {'alias': 'pretrain_neumf_factor8neg4',
1646   'num_epoch': 200,
1647   'batch_size': 1024,
1648   'optimizer': 'adam',
1649   'adam_lr': 0.01,
1650   'num_users': 671,
1651   'num_items': 5978,
1652   'latent_dim_mf': 32,
```

```
1653 'latent_dim_mlp': 32,
1654 'num_negative': 4,
1655 'layers': [64, 32, 16, 8],
1656 'l2_regularization': 1e-05,
1657 'use_cuda': True,
1658 'device_id': 0,
1659 'pretrain': False,
1660 'pretrain_mf': 'checkpoints/
    gmf_factor8neg4_Epoch100_HR0.6391_NDCG0.2852.
    model',
1661 'pretrain_mlp': 'checkpoints/
    mlp_factor8neg4_Epoch100_HR0.5606_NDCG0.2463.
    model',
1662 'model_dir': 'checkpoints/{}_{}/Epoch{}_{}/HR{:.4f}
    }_NDCG{:.4f}.model'
1663
```