

图 3.运行结果 1

```

== should early stop ==
Training ends. Total time = 562.987 s.
accurate results: hits@[1, 5, 10, 50] = [22.619 41.133 49.905 68.607]%, nr = 254.719, nrr = 0.316823, time = 18.606 s
[*] Accurate results with csIs=10, hits@[1, 5, 10, 50] = [32.086 55.152 64.819 82.829]%, nr = 82.957, nrr = 0.430821, time = 684.268 s
Results saved!
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg1_ent_ids saved.
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg2_ent_ids saved.
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg1_rel_ids saved.
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg2_rel_ids saved.
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg1_attr_ids saved.
.../output/results/MTransE/EN_FR_15K_V2/721_5fold/1/20211209012712/kg2_attr_ids saved.
Embeddings saved!
Total run time = 1490.376 s.

```

图 4.运行效果 1

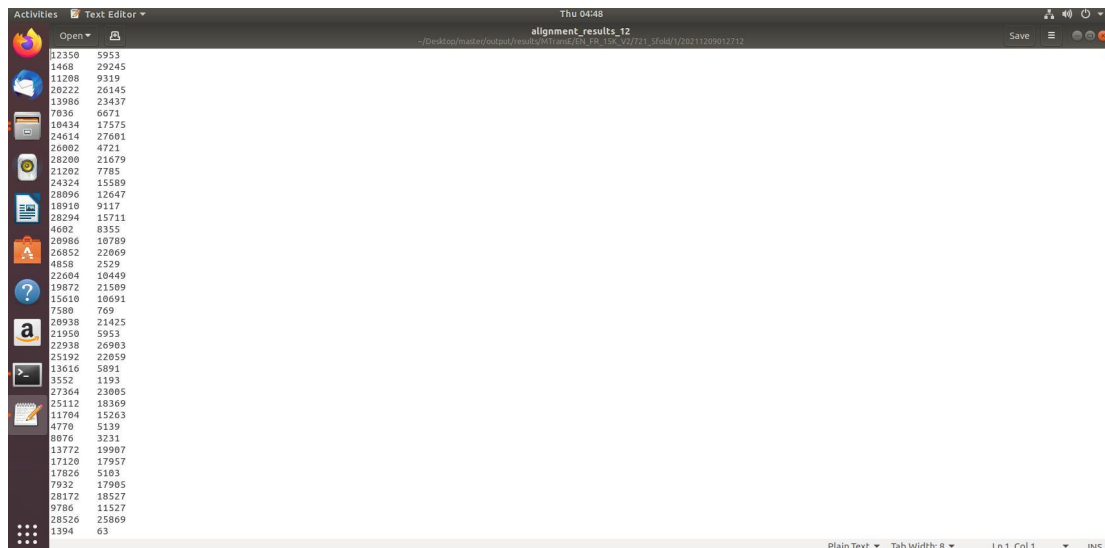


图 5.对齐结果 1

## 2. EN\_DE\_15K\_V2 的 split2 运行 MTransE:

### (1) 需求分析:

- ①测试代码 (python 源文件): main\_from\_args.py
- ②模型参数: ./args/mtranse\_args\_15K.json  
(embedding 模式为 Mtranse, 数据集规模为 15K)
- ③训练集: EN\_DE\_15K\_V2
- ④训练集具体文件夹: 2

### (2) 命令:

```
python main_from_args.py ./args/mtranse_args_15K.json EN_DE_15K_V2 721_5fold/2/
```

图 6.命令 2

### (3) 结果:

```

File Edit View Search Terminal Help
jonarch@ubuntu: ~/Desktop/master/OpenEA-master/run
epoch 159, avg. triple loss: 0.0750, cost time: 2.4132s
epoch 159, avg. mapping loss: 0.0925, cost time: 1.7514s
epoch 160, avg. triple loss: 0.0746, cost time: 2.3875s
epoch 160, avg. mapping loss: 0.0920, cost time: 1.8408s
quick results: hits@[1, 5, 10, 50] = [18.2 32.667 41.533 62. ]%, time = 1.032 s
epoch 161, avg. triple loss: 0.0741, cost time: 2.4127s
epoch 161, avg. mapping loss: 0.0926, cost time: 1.7633s
epoch 162, avg. triple loss: 0.0737, cost time: 2.4014s
epoch 162, avg. mapping loss: 0.0927, cost time: 1.7705s
epoch 163, avg. triple loss: 0.0732, cost time: 2.4217s
epoch 163, avg. mapping loss: 0.0925, cost time: 1.8078s
epoch 164, avg. triple loss: 0.0728, cost time: 2.4676s
epoch 164, avg. mapping loss: 0.0909, cost time: 2.1648s
epoch 165, avg. triple loss: 0.0724, cost time: 2.7498s
epoch 165, avg. mapping loss: 0.0859, cost time: 1.8783s
epoch 166, avg. triple loss: 0.0719, cost time: 2.7466s
epoch 166, avg. mapping loss: 0.0925, cost time: 2.0046s
epoch 167, avg. triple loss: 0.0715, cost time: 2.4822s
epoch 167, avg. mapping loss: 0.0887, cost time: 1.7637s
epoch 168, avg. triple loss: 0.0711, cost time: 2.5099s
epoch 168, avg. mapping loss: 0.0905, cost time: 1.7113s
epoch 169, avg. triple loss: 0.0707, cost time: 2.3827s
epoch 169, avg. mapping loss: 0.0889, cost time: 1.7694s
epoch 170, avg. triple loss: 0.0703, cost time: 2.3090s
epoch 170, avg. mapping loss: 0.0910, cost time: 1.6738s
quick results: hits@[1, 5, 10, 50] = [17.0 32.6 42. 61.8]%, time = 0.809 s
== should early stop ==
Training ends. Total time = 842.303 s.
accurate results: hits@[1, 5, 10, 50] = [19.41 35.048 42.6 64.705]%, nr = 191.743, nrr = 0.375115, time = 44.997 s
accurate results with csIs=10, hits@[1, 5, 10, 50] = [25.829 44.59 53.229 74.6 ]%, nr = 103.429, nrr = 0.350891, time = 383.136 s
Results saved!
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_ent_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_ent_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_rel_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_rel_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_attr_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_attr_ids saved.
Embeddings saved!
Total run time = 1211.349 s.
(openea) jonarch@ubuntu: ~/Desktop/master/OpenEA-master/run

```

图 7.运行结果 2

```

== should early stop ==
Training ends. Total time = 842.303 s.
accurate results: hits@[1, 5, 10, 50] = [19.61 35.048 42.6 64.705]%, mr = 191.743, mrr = 0.275115, time = 44.997 s
accurate results with csfs: csfs=[10, hits@[1, 5, 10, 50] = [25.829 44.59 53.229 74.6 ]%, mr = 103.429, mrr = 0.350891, time = 383.136 s
Results saved!
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_ent_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_ent_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_rel_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_rel_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg1_attr_ids saved.
.../output/results/MTransE/EN_DE_15K_V2/721_5fold/2/20211209015438/kg2_attr_ids saved.
Embeddings saved!
Total run time = 1711.349 s.

```

图 8.运行效果 2

Column 1 (Left)	Column 2 (Right)
9426	22843
19750	18697
4020	6449
16698	23511
25150	24177
29724	25391
26478	13623
26032	24751
26906	21071
26836	24159
26604	16903
26442	28007
7182	1531
27848	4445
5822	2083
26170	20597
28076	13377
12286	12003
22810	17091
7106	3509
4548	13623
17038	21523
10184	11499
10298	10075
12970	2855
20402	12289
16366	18053
3490	29065
16342	11251
17174	16805
2186	433
5692	1047
16904	11719
19464	14661
12234	12227
4566	5291
24754	18363
14084	13301
2204	1697
24732	12035
3330	191
16048	16513

图 9.对齐结果 2

三. mtranse\_args\_15K.json 和 mtranse\_args\_100K.json 有何区别，为什么要设置这种区别，而不是直接写一个 mtranse\_args.json？

答：区别在于训练时的 batch\_size 不同，同时线程数量也对应的不同。

分开写两种 batch size 的模型参数，可以应对不同训练的需求。

四. 什么是 earlystop？这个实例中为什么需要 earlystop？

答：早停是用于在深度学习训练时防止过拟合的方法，希望模型泛化能力更强，故在训练错误率达到一定值的时候就停止继续优化。

本实验中 embedding 方法是全连接神经网络，很容易过拟合，故选择用遭停发防止过拟合。