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D:\python\python.exe D:/pyCharmWorkspace/ukg2vec/src/nnet.py
config: C:\Users\dryan\.keras\keras.json
backend: tensorflow was changed into theano.
in the source file: d:\python\Lib\site-packages\keraackend\load_backend.py
Using Theano backend.
WARNING (theano.tensor.blas): Using NumPy C-API based implementation for BLAS functions.
embedding vectors: 5006 with dim = 128
Embeddings loaded.
X_train without neg samples: 249946
y_train without neg samples: 249946
Entities num: 4999
Relations num: 7
Sentences num: 9832
Valid total num: 249946
Training positive samples loaded.
Negative samples num: 249946
X_train num: 499892
y_train num: 499892
Train samples are ready!
X_test: 21720
y_test: 21720
Testing positive samples loaded.
Model: "fast_ukge"
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| Layer (type) | Output Shape | Param # |
|---------------------------|--------------|---------|
| <hr/> | | |
| lstm_1 (LSTM) | (None, 128) | 131584 |
| <hr/> | | |
| dense_1 (Dense) | (None, 1) | 129 |
| <hr/> | | |
| Total params: 131,713 | | |
| Trainable params: 131,713 | | |
| Non-trainable params: 0 | | |

Begin training

X_train shape: (499892, 3, 128)
y_train shape: (499892,)
Train on 444353 samples, validate on 55539 samples
Epoch 1/80
- 284s - loss: 0.0233 - mean_absolute_error: 0.0970 - val_loss: 0.0165 - val_mean_absolute_error: 0.074

Epoch 00001: val_loss improved from inf to 0.01645, saving model to D:\pyCharmWorkspace\ukg2vec\data\ppi
Epoch 2/80
- 370s - loss: 0.0150 - mean_absolute_error: 0.0700 - val_loss: 0.0140 - val_mean_absolute_error: 0.066

Epoch 00002: val_loss improved from 0.01645 to 0.01401, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 3/80
- 373s - loss: 0.0135 - mean_absolute_error: 0.0642 - val_loss: 0.0129 - val_mean_absolute_error: 0.061

Epoch 00003: val_loss improved from 0.01401 to 0.01291, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 4/80
- 256s - loss: 0.0126 - mean_absolute_error: 0.0608 - val_loss: 0.0123 - val_mean_absolute_error: 0.058

Epoch 00004: val_loss improved from 0.01291 to 0.01226, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 5/80
- 242s - loss: 0.0119 - mean_absolute_error: 0.0584 - val_loss: 0.0118 - val_mean_absolute_error: 0.057

Epoch 00005: val_loss improved from 0.01226 to 0.01175, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 6/80
- 245s - loss: 0.0113 - mean_absolute_error: 0.0565 - val_loss: 0.0113 - val_mean_absolute_error: 0.054

Epoch 00006: val_loss improved from 0.01175 to 0.01134, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 7/80
- 246s - loss: 0.0108 - mean_absolute_error: 0.0547 - val_loss: 0.0108 - val_mean_absolute_error: 0.053

Epoch 00007: val_loss improved from 0.01134 to 0.01077, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 8/80
- 241s - loss: 0.0105 - mean_absolute_error: 0.0534 - val_loss: 0.0107 - val_mean_absolute_error: 0.054

Epoch 00008: val_loss improved from 0.01077 to 0.01068, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 9/80
- 230s - loss: 0.0101 - mean_absolute_error: 0.0522 - val_loss: 0.0105 - val_mean_absolute_error: 0.053

Epoch 00009: val_loss improved from 0.01068 to 0.01046, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 10/80
- 231s - loss: 0.0098 - mean_absolute_error: 0.0511 - val_loss: 0.0100 - val_mean_absolute_error: 0.050

Epoch 00010: val_loss improved from 0.01046 to 0.00996, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 11/80
- 230s - loss: 0.0096 - mean_absolute_error: 0.0502 - val_loss: 0.0099 - val_mean_absolute_error: 0.050

Epoch 00011: val_loss improved from 0.00996 to 0.00991, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 12/80
- 230s - loss: 0.0093 - mean_absolute_error: 0.0493 - val_loss: 0.0096 - val_mean_absolute_error: 0.049

Epoch 00012: val_loss improved from 0.00991 to 0.00956, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 13/80
- 231s - loss: 0.0091 - mean_absolute_error: 0.0485 - val_loss: 0.0095 - val_mean_absolute_error: 0.049

Epoch 00013: val_loss improved from 0.00956 to 0.00949, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 14/80
- 230s - loss: 0.0090 - mean_absolute_error: 0.0479 - val_loss: 0.0092 - val_mean_absolute_error: 0.048

Epoch 00014: val_loss improved from 0.00949 to 0.00924, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 15/80
- 230s - loss: 0.0088 - mean_absolute_error: 0.0472 - val_loss: 0.0090 - val_mean_absolute_error: 0.047

Epoch 00015: val_loss improved from 0.00924 to 0.00900, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 16/80
- 230s - loss: 0.0086 - mean_absolute_error: 0.0466 - val_loss: 0.0092 - val_mean_absolute_error: 0.049

Epoch 00016: val_loss did not improve from 0.00900
Epoch 17/80
- 232s - loss: 0.0084 - mean_absolute_error: 0.0460 - val_loss: 0.0091 - val_mean_absolute_error: 0.047

Epoch 00017: val_loss did not improve from 0.00900
Epoch 18/80
- 231s - loss: 0.0083 - mean_absolute_error: 0.0456 - val_loss: 0.0088 - val_mean_absolute_error: 0.046

Epoch 00018: val_loss improved from 0.00900 to 0.00880, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 19/80
- 230s - loss: 0.0082 - mean_absolute_error: 0.0450 - val_loss: 0.0088 - val_mean_absolute_error: 0.046

Epoch 00019: val_loss improved from 0.00880 to 0.00877, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 20/80
- 230s - loss: 0.0080 - mean_absolute_error: 0.0445 - val_loss: 0.0086 - val_mean_absolute_error: 0.046

Epoch 00020: val_loss improved from 0.00877 to 0.00863, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 21/80
- 231s - loss: 0.0079 - mean_absolute_error: 0.0441 - val_loss: 0.0085 - val_mean_absolute_error: 0.045

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Epoch 00021: val_loss improved from 0.00863 to 0.00854, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 22/80
- 230s - loss: 0.0078 - mean_absolute_error: 0.0436 - val_loss: 0.0085 - val_mean_absolute_error: 0.044

Epoch 00022: val_loss improved from 0.00854 to 0.00845, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 23/80
- 230s - loss: 0.0077 - mean_absolute_error: 0.0433 - val_loss: 0.0084 - val_mean_absolute_error: 0.044

Epoch 00023: val_loss improved from 0.00845 to 0.00840, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 24/80
- 232s - loss: 0.0076 - mean_absolute_error: 0.0429 - val_loss: 0.0085 - val_mean_absolute_error: 0.044

Epoch 00024: val_loss did not improve from 0.00840
Epoch 25/80
- 232s - loss: 0.0075 - mean_absolute_error: 0.0425 - val_loss: 0.0084 - val_mean_absolute_error: 0.044

Epoch 00025: val_loss improved from 0.00840 to 0.00837, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 26/80
- 231s - loss: 0.0074 - mean_absolute_error: 0.0422 - val_loss: 0.0082 - val_mean_absolute_error: 0.043

Epoch 00026: val_loss improved from 0.00837 to 0.00819, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 27/80
- 231s - loss: 0.0073 - mean_absolute_error: 0.0418 - val_loss: 0.0080 - val_mean_absolute_error: 0.043

Epoch 00027: val_loss improved from 0.00819 to 0.00798, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 28/80
- 231s - loss: 0.0072 - mean_absolute_error: 0.0415 - val_loss: 0.0081 - val_mean_absolute_error: 0.043

Epoch 00028: val_loss did not improve from 0.00798
Epoch 29/80
- 231s - loss: 0.0071 - mean_absolute_error: 0.0412 - val_loss: 0.0081 - val_mean_absolute_error: 0.043

Epoch 00029: val_loss did not improve from 0.00798
Epoch 30/80
- 230s - loss: 0.0070 - mean_absolute_error: 0.0409 - val_loss: 0.0080 - val_mean_absolute_error: 0.043

Epoch 00030: val_loss did not improve from 0.00798
Epoch 31/80
- 231s - loss: 0.0069 - mean_absolute_error: 0.0406 - val_loss: 0.0079 - val_mean_absolute_error: 0.042

Epoch 00031: val_loss improved from 0.00798 to 0.00786, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 32/80
- 232s - loss: 0.0069 - mean_absolute_error: 0.0403 - val_loss: 0.0079 - val_mean_absolute_error: 0.043

Epoch 00032: val_loss did not improve from 0.00786
Epoch 33/80
- 233s - loss: 0.0068 - mean_absolute_error: 0.0400 - val_loss: 0.0078 - val_mean_absolute_error: 0.042

Epoch 00033: val_loss improved from 0.00786 to 0.00784, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 34/80
- 231s - loss: 0.0067 - mean_absolute_error: 0.0397 - val_loss: 0.0079 - val_mean_absolute_error: 0.042

Epoch 00034: val_loss did not improve from 0.00784
Epoch 35/80
- 231s - loss: 0.0066 - mean_absolute_error: 0.0395 - val_loss: 0.0080 - val_mean_absolute_error: 0.042

Epoch 00035: val_loss did not improve from 0.00784
Epoch 36/80
- 231s - loss: 0.0066 - mean_absolute_error: 0.0392 - val_loss: 0.0078 - val_mean_absolute_error: 0.041
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Epoch 00036: val_loss improved from 0.00784 to 0.00782, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 37/80
- 231s - loss: 0.0065 - mean_absolute_error: 0.0390 - val_loss: 0.0078 - val_mean_absolute_error: 0.042

Epoch 00037: val_loss did not improve from 0.00782
Epoch 38/80
- 233s - loss: 0.0064 - mean_absolute_error: 0.0388 - val_loss: 0.0076 - val_mean_absolute_error: 0.041

Epoch 00038: val_loss improved from 0.00782 to 0.00763, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 39/80
- 232s - loss: 0.0064 - mean_absolute_error: 0.0385 - val_loss: 0.0076 - val_mean_absolute_error: 0.041

Epoch 00039: val_loss improved from 0.00763 to 0.00761, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 40/80
- 233s - loss: 0.0063 - mean_absolute_error: 0.0383 - val_loss: 0.0076 - val_mean_absolute_error: 0.040

Epoch 00040: val_loss improved from 0.00761 to 0.00759, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 41/80
- 231s - loss: 0.0062 - mean_absolute_error: 0.0381 - val_loss: 0.0075 - val_mean_absolute_error: 0.040

Epoch 00041: val_loss improved from 0.00759 to 0.00749, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 42/80
- 231s - loss: 0.0062 - mean_absolute_error: 0.0379 - val_loss: 0.0076 - val_mean_absolute_error: 0.040

Epoch 00042: val_loss did not improve from 0.00749
Epoch 43/80
- 231s - loss: 0.0061 - mean_absolute_error: 0.0377 - val_loss: 0.0076 - val_mean_absolute_error: 0.041

Epoch 00043: val_loss did not improve from 0.00749
Epoch 44/80
- 233s - loss: 0.0061 - mean_absolute_error: 0.0375 - val_loss: 0.0076 - val_mean_absolute_error: 0.041

Epoch 00044: val_loss did not improve from 0.00749
Epoch 45/80
- 231s - loss: 0.0060 - mean_absolute_error: 0.0373 - val_loss: 0.0076 - val_mean_absolute_error: 0.040

Epoch 00045: val_loss did not improve from 0.00749
Epoch 46/80
- 231s - loss: 0.0060 - mean_absolute_error: 0.0371 - val_loss: 0.0075 - val_mean_absolute_error: 0.040

Epoch 00046: val_loss improved from 0.00749 to 0.00748, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 47/80
- 231s - loss: 0.0059 - mean_absolute_error: 0.0369 - val_loss: 0.0074 - val_mean_absolute_error: 0.040

Epoch 00047: val_loss improved from 0.00748 to 0.00743, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 48/80
- 233s - loss: 0.0059 - mean_absolute_error: 0.0368 - val_loss: 0.0074 - val_mean_absolute_error: 0.040

Epoch 00048: val_loss improved from 0.00743 to 0.00738, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 49/80
- 231s - loss: 0.0058 - mean_absolute_error: 0.0366 - val_loss: 0.0075 - val_mean_absolute_error: 0.039

Epoch 00049: val_loss did not improve from 0.00738
Epoch 50/80
- 232s - loss: 0.0058 - mean_absolute_error: 0.0364 - val_loss: 0.0075 - val_mean_absolute_error: 0.040

Epoch 00050: val_loss did not improve from 0.00738
Epoch 51/80
- 232s - loss: 0.0057 - mean_absolute_error: 0.0363 - val_loss: 0.0074 - val_mean_absolute_error: 0.039
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Epoch 00051: val_loss did not improve from 0.00738
Epoch 52/80
- 232s - loss: 0.0057 - mean_absolute_error: 0.0361 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00052: val_loss did not improve from 0.00738
Epoch 53/80
- 232s - loss: 0.0056 - mean_absolute_error: 0.0359 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00053: val_loss improved from 0.00738 to 0.00738, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 54/80
- 231s - loss: 0.0056 - mean_absolute_error: 0.0358 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00054: val_loss did not improve from 0.00738
Epoch 55/80
- 231s - loss: 0.0055 - mean_absolute_error: 0.0356 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00055: val_loss did not improve from 0.00738
Epoch 56/80
- 231s - loss: 0.0055 - mean_absolute_error: 0.0354 - val_loss: 0.0073 - val_mean_absolute_error: 0.039

Epoch 00056: val_loss improved from 0.00738 to 0.00731, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 57/80
- 230s - loss: 0.0055 - mean_absolute_error: 0.0353 - val_loss: 0.0073 - val_mean_absolute_error: 0.039

Epoch 00057: val_loss did not improve from 0.00731
Epoch 58/80
- 231s - loss: 0.0054 - mean_absolute_error: 0.0352 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00058: val_loss did not improve from 0.00731
Epoch 59/80
- 231s - loss: 0.0054 - mean_absolute_error: 0.0350 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00059: val_loss improved from 0.00731 to 0.00721, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 60/80
- 233s - loss: 0.0054 - mean_absolute_error: 0.0349 - val_loss: 0.0073 - val_mean_absolute_error: 0.039

Epoch 00060: val_loss did not improve from 0.00721
Epoch 61/80
- 231s - loss: 0.0053 - mean_absolute_error: 0.0348 - val_loss: 0.0074 - val_mean_absolute_error: 0.039

Epoch 00061: val_loss did not improve from 0.00721
Epoch 62/80
- 231s - loss: 0.0053 - mean_absolute_error: 0.0346 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00062: val_loss did not improve from 0.00721
Epoch 63/80
- 232s - loss: 0.0053 - mean_absolute_error: 0.0346 - val_loss: 0.0072 - val_mean_absolute_error: 0.039

Epoch 00063: val_loss did not improve from 0.00721
Epoch 64/80
- 234s - loss: 0.0052 - mean_absolute_error: 0.0344 - val_loss: 0.0073 - val_mean_absolute_error: 0.039

Epoch 00064: val_loss did not improve from 0.00721
Epoch 65/80
- 232s - loss: 0.0052 - mean_absolute_error: 0.0343 - val_loss: 0.0075 - val_mean_absolute_error: 0.040

Epoch 00065: val_loss did not improve from 0.00721
Epoch 66/80
- 234s - loss: 0.0051 - mean_absolute_error: 0.0342 - val_loss: 0.0073 - val_mean_absolute_error: 0.038
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Epoch 00066: val_loss did not improve from 0.00721
Epoch 67/80
- 239s - loss: 0.0051 - mean_absolute_error: 0.0340 - val_loss: 0.0073 - val_mean_absolute_error: 0.039

Epoch 00067: val_loss did not improve from 0.00721
Epoch 68/80
- 233s - loss: 0.0051 - mean_absolute_error: 0.0340 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00068: val_loss did not improve from 0.00721
Epoch 69/80
- 235s - loss: 0.0050 - mean_absolute_error: 0.0338 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00069: val_loss did not improve from 0.00721
Epoch 70/80
- 1178s - loss: 0.0050 - mean_absolute_error: 0.0337 - val_loss: 0.0073 - val_mean_absolute_error: 0.038

Epoch 00070: val_loss did not improve from 0.00721
Epoch 71/80
- 231s - loss: 0.0050 - mean_absolute_error: 0.0336 - val_loss: 0.0071 - val_mean_absolute_error: 0.037

Epoch 00071: val_loss improved from 0.00721 to 0.00711, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 72/80
- 232s - loss: 0.0049 - mean_absolute_error: 0.0335 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00072: val_loss did not improve from 0.00711
Epoch 73/80
- 238s - loss: 0.0049 - mean_absolute_error: 0.0334 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00073: val_loss did not improve from 0.00711
Epoch 74/80
- 231s - loss: 0.0049 - mean_absolute_error: 0.0333 - val_loss: 0.0071 - val_mean_absolute_error: 0.038

Epoch 00074: val_loss did not improve from 0.00711
Epoch 75/80
- 231s - loss: 0.0049 - mean_absolute_error: 0.0332 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00075: val_loss did not improve from 0.00711
Epoch 76/80
- 231s - loss: 0.0048 - mean_absolute_error: 0.0331 - val_loss: 0.0071 - val_mean_absolute_error: 0.038

Epoch 00076: val_loss did not improve from 0.00711
Epoch 77/80
- 231s - loss: 0.0048 - mean_absolute_error: 0.0330 - val_loss: 0.0071 - val_mean_absolute_error: 0.038

Epoch 00077: val_loss improved from 0.00711 to 0.00709, saving model to D:\pyCharmWorkspace\ukg2vec\data
Epoch 78/80
- 230s - loss: 0.0048 - mean_absolute_error: 0.0329 - val_loss: 0.0072 - val_mean_absolute_error: 0.038

Epoch 00078: val_loss did not improve from 0.00709
Epoch 79/80
- 230s - loss: 0.0048 - mean_absolute_error: 0.0327 - val_loss: 0.0073 - val_mean_absolute_error: 0.038

Epoch 00079: val_loss did not improve from 0.00709
Epoch 80/80
- 229s - loss: 0.0047 - mean_absolute_error: 0.0327 - val_loss: 0.0071 - val_mean_absolute_error: 0.038

Epoch 00080: val_loss did not improve from 0.00709
Train FINISHED.
Time consumed(s): 20041.120455265045
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Evaluate results:  
MSE, MAE = [0.01138373834405156, 0.06398119777441025]
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Process finished with exit code 0
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