ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar RankLib-2.18.jar

Usage: java -jar RankLib.jar <Params>

Params:

[+] Training (+ tuning and evaluation)

-train <file> Training data

-ranker <type> Specify which ranking algorithm to use

0: MART (gradient boosted regression tree)

1: RankNet

2: RankBoost

3: AdaRank

4: Coordinate Ascent

6: LambdaMART

7: ListNet

8: Random Forests

9: Linear regression (L2 regularization)

[ -feature <file> ] Feature description file: list features to be considered by the learner, each on a separate line

If not specified, all features will be used.

[ -metric2t <metric> ] Metric to optimize on the training data. Supported: MAP, NDCG@k, DCG@k, P@k, RR@k, ERR@k (default=ERR@10)

[ -gmax <label> ] Highest judged relevance label. It affects the calculation of ERR (default=4, i.e. 5-point scale {0,1,2,3,4})

[ -qrel <file> ] TREC-style relevance judgment file. It only affects MAP and NDCG (default=unspecified)

[ -silent ] Do not print progress messages (which are printed by default)

[ -missingZero ] Substitute zero for missing feature values rather than throwing an exception.

[ -validate <file> ] Specify if you want to tune your system on the validation data (default=unspecified)

If specified, the final model will be the one that performs best on the validation data

[ -tvs <x \in [0..1]> ] If you don't have separate validation data, use this to set train-validation split to be (x)(1.0-x)

[ -save <model> ] Save the model learned (default=not-save)

[ -test <file> ] Specify if you want to evaluate the trained model on this data (default=unspecified)

[ -tts <x \in [0..1]> ] Set train-test split to be (x)(1.0-x). -tts will override -tvs

[ -metric2T <metric> ] Metric to evaluate on the test data (default to the same as specified for -metric2t)

[ -norm <method>] Normalize all feature vectors (default=no-normalization). Method can be:

sum: normalize each feature by the sum of all its values

zscore: normalize each feature by its mean/standard deviation

linear: normalize each feature by its min/max values

[ -kcv <k> ] Specify if you want to perform k-fold cross validation using the specified training data (default=NoCV)

-tvs can be used to further reserve a portion of the training data in each fold for validation

[ -kcvmd <dir> ] Directory for models trained via cross-validation (default=not-save)

[ -kcvmn <model> ] Name for model learned in each fold. It will be prefix-ed with the fold-number (default=empty)

[-] RankNet-specific parameters

[ -epoch <T> ] The number of epochs to train (default=100)

[ -layer <layer> ] The number of hidden layers (default=1)

[ -node <node> ] The number of hidden nodes per layer (default=10)

[ -lr <rate> ] Learning rate (default=0.00005)

[-] RankBoost-specific parameters

[ -round <T> ] The number of rounds to train (default=300)

[ -tc <k> ] Number of threshold candidates to search. -1 to use all feature values (default=10)

[-] AdaRank-specific parameters

[ -round <T> ] The number of rounds to train (default=500)

[ -noeq ] Train without enqueuing too-strong features (default=unspecified)

[ -tolerance <t> ] Tolerance between two consecutive rounds of learning (default=0.002)

[ -max <times> ] The maximum number of times a feature can be consecutively selected without changing performance (default=5)

[-] Coordinate Ascent-specific parameters

[ -r <k> ] The number of random restarts (default=5)

[ -i <iteration> ] The number of iterations to search in each dimension (default=25)

[ -tolerance <t> ] Performance tolerance between two solutions (default=0.001)

[ -reg <slack> ] Regularization parameter (default=no-regularization)

[-] {MART, LambdaMART}-specific parameters

[ -tree <t> ] Number of trees (default=1000)

[ -leaf <l> ] Number of leaves for each tree (default=10)

[ -shrinkage <factor> ] Shrinkage, or learning rate (default=0.1)

[ -tc <k> ] Number of threshold candidates for tree spliting. -1 to use all feature values (default=256)

[ -mls <n> ] Min leaf support -- minimum % of docs each leaf has to contain (default=1)

[ -estop <e> ] Stop early when no improvement is observed on validaton data in e consecutive rounds (default=100)

[-] ListNet-specific parameters

[ -epoch <T> ] The number of epochs to train (default=1500)

[ -lr <rate> ] Learning rate (default=0.00001)

[-] Random Forests-specific parameters

[ -bag <r> ] Number of bags (default=300)

[ -srate <r> ] Sub-sampling rate (default=1.0)

[ -frate <r> ] Feature sampling rate (default=0.3)

[ -rtype <type> ] Ranker to bag (default=0, i.e. MART)

[ -tree <t> ] Number of trees in each bag (default=1)

[ -leaf <l> ] Number of leaves for each tree (default=100)

[ -shrinkage <factor> ] Shrinkage, or learning rate (default=0.1)

[ -tc <k> ] Number of threshold candidates for tree spliting. -1 to use all feature values (default=256)

[ -mls <n> ] Min leaf support -- minimum % of docs each leaf has to contain (default=1)

[-] Linear Regression-specific parameters

[ -L2 <reg> ] L2 regularization parameter (default=1.0E-10)

[+] Testing previously saved models

-load <model> The model to load

Multiple -load can be used to specify models from multiple folds (in increasing order),

in which case the test/rank data will be partitioned accordingly.

-test <file> Test data to evaluate the model(s) (specify either this or -rank but not both)

-rank <file> Rank the samples in the specified file (specify either this or -test but not both)

[ -metric2T <metric> ] Metric to evaluate on the test data (default=ERR@10)

[ -gmax <label> ] Highest judged relevance label. It affects the calculation of ERR (default=4, i.e. 5-point scale {0,1,2,3,4})

[ -score <file>] Store ranker's score for each object being ranked (has to be used with -rank)

[ -qrel <file> ] TREC-style relevance judgment file. It only affects MAP and NDCG (default=unspecified)

[ -idv <file> ] Save model performance (in test metric) on individual ranked lists (has to be used with -test)

[ -norm ] Normalize feature vectors (similar to -norm for training/tuning)

ncyu@ncyu-virtual-machine:~/Ranklib$ ant

Command 'ant' not found, but can be installed with:

sudo snap install ant # version 1.10.14, or

sudo apt install ant # version 1.10.12-1

See 'snap info ant' for additional versions.

ncyu@ncyu-virtual-machine:~/Ranklib$ ls

MQ2008 MQ2008.rar RankLib-2.18.jar

ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar bin/RankLib.jar -train MQ2008/Fold1/train.txt -test MQ2008/Fold1/test.txt -validate MQ2008/Fold1/vali.txt -ranker 6 -metric2t NDCG@10 -metric2T ERR@10 -save testranklib\_model.txt

Error: Unable to access jarfile bin/RankLib.jar

ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar bin/RankLib-2.18.jar -train MQ2008/Fold1/train.txt -test MQ2008/Fold1/test.txt -validate MQ2008/Fold1/vali.txt -ranker 6 -metric2t NDCG@10 -metric2T ERR@10 -save testranklib\_model.txt

Error: Unable to access jarfile bin/RankLib-2.18.jar

ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar RankLib-2.18.jar -train MQ2008/Fold1/train.txt -test MQ2008/Fold1/test.txt -validate MQ2008/Fold1/vali.txt -ranker 6 -metric2t NDCG@10 -metric2T ERR@10 -save testranklib\_model.txt

Discard orig. features

Training data: MQ2008/Fold1/train.txt

Test data: MQ2008/Fold1/test.txt

Validation data: MQ2008/Fold1/vali.txt

Feature vector representation: Dense.

Ranking method: LambdaMART

Feature description file: Unspecified. All features will be used.

Train metric: NDCG@10

Test metric: ERR@10

Highest relevance label (to compute ERR): 4

Feature normalization: No

Model file: testranklib\_model.txt

[+] LambdaMART's Parameters:

No. of trees: 1000

No. of leaves: 10

No. of threshold candidates: 256

Min leaf support: 1

Learning rate: 0.1

Stop early: 100 rounds without performance gain on validation data

Reading feature file [MQ2008/Fold1/train.txt]... [Done.]

(471 ranked lists, 9630 entries read)

Reading feature file [MQ2008/Fold1/vali.txt]... [Done.]

(157 ranked lists, 2707 entries read)

Reading feature file [MQ2008/Fold1/test.txt]... [Done.]

(156 ranked lists, 2874 entries read)

Initializing... [Done]

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Training starts...

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

#iter | NDCG@10-T | NDCG@10-V |

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

1 | 0.4908 | 0.5351 |

2 | 0.4949 | 0.5431 |

3 | 0.4923 | 0.5476 |

4 | 0.4927 | 0.5462 |

5 | 0.4948 | 0.5455 |

6 | 0.4927 | 0.5435 |

7 | 0.4929 | 0.5403 |

8 | 0.4943 | 0.5435 |

9 | 0.494 | 0.5432 |

10 | 0.4943 | 0.5449 |

11 | 0.4981 | 0.5424 |

12 | 0.5013 | 0.5449 |

13 | 0.5042 | 0.5459 |

14 | 0.5046 | 0.5421 |

15 | 0.5063 | 0.5416 |

16 | 0.5104 | 0.5413 |

17 | 0.5098 | 0.5451 |

18 | 0.5135 | 0.5443 |

19 | 0.5127 | 0.5468 |

20 | 0.5151 | 0.5449 |

21 | 0.5169 | 0.5453 |

22 | 0.5184 | 0.5433 |

23 | 0.5183 | 0.545 |

24 | 0.5203 | 0.5418 |

25 | 0.5212 | 0.5418 |

26 | 0.5211 | 0.5442 |

27 | 0.5222 | 0.5417 |

28 | 0.5236 | 0.5429 |

29 | 0.5251 | 0.5464 |

30 | 0.5259 | 0.542 |

31 | 0.5269 | 0.5427 |

32 | 0.5279 | 0.5432 |

33 | 0.5303 | 0.5472 |

34 | 0.5322 | 0.5477 |

35 | 0.5328 | 0.5467 |

36 | 0.5309 | 0.5459 |

37 | 0.5327 | 0.5456 |

38 | 0.5348 | 0.5465 |

39 | 0.5353 | 0.5465 |

40 | 0.5348 | 0.5441 |

41 | 0.537 | 0.5443 |

42 | 0.5362 | 0.5414 |

43 | 0.538 | 0.5423 |

44 | 0.5399 | 0.5401 |

45 | 0.5405 | 0.5388 |

46 | 0.5412 | 0.5396 |

47 | 0.5434 | 0.5399 |

48 | 0.5442 | 0.5424 |

49 | 0.5452 | 0.5433 |

50 | 0.5459 | 0.5424 |

51 | 0.5456 | 0.5413 |

52 | 0.5459 | 0.5408 |

53 | 0.5471 | 0.5414 |

54 | 0.5482 | 0.5429 |

55 | 0.5479 | 0.5399 |

56 | 0.5496 | 0.5397 |

57 | 0.5514 | 0.5397 |

58 | 0.5522 | 0.5402 |

59 | 0.5526 | 0.538 |

60 | 0.5537 | 0.5383 |

61 | 0.5549 | 0.5382 |

62 | 0.5552 | 0.5391 |

63 | 0.5563 | 0.5371 |

64 | 0.5573 | 0.5374 |

65 | 0.5593 | 0.5379 |

66 | 0.5591 | 0.5376 |

67 | 0.5594 | 0.5368 |

68 | 0.5614 | 0.5372 |

69 | 0.5623 | 0.5404 |

70 | 0.5634 | 0.5416 |

71 | 0.5643 | 0.5404 |

72 | 0.5637 | 0.5404 |

73 | 0.5646 | 0.5387 |

74 | 0.5655 | 0.5402 |

75 | 0.5659 | 0.5394 |

76 | 0.5673 | 0.5398 |

77 | 0.567 | 0.5392 |

78 | 0.5676 | 0.5387 |

79 | 0.5694 | 0.5391 |

80 | 0.5697 | 0.5384 |

81 | 0.5707 | 0.5392 |

82 | 0.5731 | 0.538 |

83 | 0.5733 | 0.5376 |

84 | 0.5741 | 0.536 |

85 | 0.5743 | 0.5353 |

86 | 0.5738 | 0.535 |

87 | 0.573 | 0.5374 |

88 | 0.5751 | 0.5369 |

89 | 0.5763 | 0.539 |

90 | 0.5761 | 0.5376 |

91 | 0.5769 | 0.5374 |

92 | 0.5795 | 0.539 |

93 | 0.5798 | 0.5397 |

94 | 0.5781 | 0.5403 |

95 | 0.5783 | 0.5397 |

96 | 0.5811 | 0.54 |

97 | 0.5811 | 0.54 |

98 | 0.5817 | 0.5391 |

99 | 0.5812 | 0.5392 |

100 | 0.5817 | 0.5379 |

101 | 0.5834 | 0.5389 |

102 | 0.5837 | 0.5392 |

103 | 0.5857 | 0.5401 |

104 | 0.5865 | 0.5384 |

105 | 0.5875 | 0.5384 |

106 | 0.5896 | 0.537 |

107 | 0.59 | 0.5368 |

108 | 0.5911 | 0.5397 |

109 | 0.5912 | 0.5419 |

110 | 0.5913 | 0.5417 |

111 | 0.5924 | 0.541 |

112 | 0.593 | 0.5426 |

113 | 0.5929 | 0.5432 |

114 | 0.5942 | 0.5402 |

115 | 0.5947 | 0.5402 |

116 | 0.5948 | 0.5391 |

117 | 0.5949 | 0.5389 |

118 | 0.5966 | 0.5391 |

119 | 0.5964 | 0.5406 |

120 | 0.5988 | 0.5404 |

121 | 0.5988 | 0.5401 |

122 | 0.5987 | 0.5423 |

123 | 0.5994 | 0.5406 |

124 | 0.5999 | 0.5404 |

125 | 0.5996 | 0.54 |

126 | 0.6 | 0.5401 |

127 | 0.5999 | 0.5403 |

128 | 0.6002 | 0.5407 |

129 | 0.6006 | 0.54 |

130 | 0.6003 | 0.5416 |

131 | 0.6006 | 0.5412 |

132 | 0.6002 | 0.5396 |

133 | 0.6003 | 0.5436 |

134 | 0.6005 | 0.5443 |

135 | 0.6008 | 0.5435 |

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Finished sucessfully.

NDCG@10 on training data: 0.5322

NDCG@10 on validation data: 0.5477

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ERR@10 on test data: 0.0983

Model saved to: testranklib\_model.txt

ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar RankLib-2.18.jar -train MQ2008/Fold1/train.txt -test MQ2008/Fold1/test.txt -validate MQ2008/Fold1/vali.txt -ranker 6 -metric2t NDCG@10 -metric2T ERR@10 -save testranklib\_model.txt

Discard orig. features

Training data: MQ2008/Fold1/train.txt

Test data: MQ2008/Fold1/test.txt

Validation data: MQ2008/Fold1/vali.txt

Feature vector representation: Dense.

Ranking method: LambdaMART

Feature description file: Unspecified. All features will be used.

Train metric: NDCG@10

Test metric: ERR@10

Highest relevance label (to compute ERR): 4

Feature normalization: No

Model file: testranklib\_model.txt

[+] LambdaMART's Parameters:

No. of trees: 1000

No. of leaves: 10

No. of threshold candidates: 256

Min leaf support: 1

Learning rate: 0.1

Stop early: 100 rounds without performance gain on validation data

Reading feature file [MQ2008/Fold1/train.txt]... [Done.]

(471 ranked lists, 9630 entries read)

Reading feature file [MQ2008/Fold1/vali.txt]... [Done.]

(157 ranked lists, 2707 entries read)

Reading feature file [MQ2008/Fold1/test.txt]... [Done.]

(156 ranked lists, 2874 entries read)

Initializing... [Done]

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Training starts...

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

#iter | NDCG@10-T | NDCG@10-V |

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

1 | 0.4908 | 0.5351 |

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125 | 0.5996 | 0.54 |

126 | 0.6 | 0.5401 |

127 | 0.5999 | 0.5403 |

128 | 0.6002 | 0.5407 |

129 | 0.6006 | 0.54 |

130 | 0.6003 | 0.5416 |

131 | 0.6006 | 0.5412 |

132 | 0.6002 | 0.5396 |

133 | 0.6003 | 0.5436 |

134 | 0.6005 | 0.5443 |

135 | 0.6008 | 0.5435 |

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Finished sucessfully.

NDCG@10 on training data: 0.5322

NDCG@10 on validation data: 0.5477

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

ERR@10 on test data: 0.0983

Model saved to: testranklib\_model.txt

ncyu@ncyu-virtual-machine:~/Ranklib$ java -version

openjdk version "11.0.24" 2024-07-16

OpenJDK Runtime Environment (build 11.0.24+8-post-Ubuntu-1ubuntu322.04)

OpenJDK 64-Bit Server VM (build 11.0.24+8-post-Ubuntu-1ubuntu322.04, mixed mode, sharing)

ncyu@ncyu-virtual-machine:~/Ranklib$ java -jar RankLib-2.18.jar -load testranklib\_model.txt -test MQ2008/Fold1/test.txt -metric2T ERR@10

Discard orig. features

Model file: testranklib\_model.txt

Feature normalization: No

Test metric: ERR@10

Highest relevance label (to compute ERR): 4

Model: LambdaMART

Reading feature file [MQ2008/Fold1/test.txt]... [Done.]

(156 ranked lists, 2874 entries read)

ERR@10 on test data: 0.0983

ncyu@ncyu-virtual-machine:~/Ranklib$