

Example Session for Supervised Classification

Andreas Borg, Murat Sariyar

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This document shows an example session for using supervised classification in the package *RecordLinkage* for deduplication of a single data set. Conducting linkage of two data sets differs only in the step of generating record pairs.

See also the vignette on Fellegi-Sunter deduplication for some general information on using the package.

1 Generating comparison patterns

In this session, a training set with 50 matches and 250 non-matches is generated from the included data set `RLData10000`. Record pairs from the set `RLData500` are used to calibrate and subsequently evaluate the classifiers.

```
> data(RLdata500)
> data(RLdata10000)
> train_pairs = compare.dedup(RLdata10000,
+   identity = identity.RLdata10000, n_match = 500,
+   n_non_match = 500)
> eval_pairs = compare.dedup(RLdata500,
+   identity = identity.RLdata500)
```

2 Training

`trainSupv` handles calibration of supervised classifiers which are selected through the argument `method`. In the following, a single decision tree (`rpart`), a bootstrap aggregation of decision trees (`bagging`) and a support vector machine are calibrated (`svm`).

```
> model_rpart = trainSupv(train_pairs, method = "rpart")
> model_bagging = trainSupv(train_pairs,
+   method = "bagging")
> model_svm = trainSupv(train_pairs, method = "svm")
```

3 Classification

`classifySupv` handles classification for all supervised classifiers, taking as arguments the structure returned by `trainSupv` which contains the classification model and the set of record pairs which to classify.

```

> result_rpart = classifySupv(model_rpart,
+   eval_pairs)
> result_bagging = classifySupv(model_bagging,
+   eval_pairs)
> result_svm = classifySupv(model_svm, eval_pairs)

```

4 Results

4.1 Rpart

alpha error 0.000000

beta error 0.014755

accuracy 0.985251

| | N | P | L |
|-------|--------|---|------|
| FALSE | 122860 | 0 | 1840 |
| TRUE | 0 | 0 | 50 |

4.2 Bagging

alpha error 0.000000

beta error 0.001460

accuracy 0.998541

| | N | P | L |
|-------|--------|---|-----|
| FALSE | 124518 | 0 | 182 |
| TRUE | 0 | 0 | 50 |

4.3 SVM

alpha error 0.000000

beta error 0.002045

accuracy 0.997956

| | N | P | L |
|-------|--------|---|-----|
| FALSE | 124445 | 0 | 255 |
| TRUE | 0 | 0 | 50 |