

# Example Session for Supervised Classification

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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** 0.020000

**beta error** 0.012638

**accuracy** 0.987359

	N	P	L
FALSE	123124	0	1576
TRUE	1	0	49

### 4.2 Bagging

**alpha error** 0.000000

**beta error** 0.002574

**accuracy** 0.997427

	N	P	L
FALSE	124379	0	321
TRUE	0	0	50

### 4.3 SVM

**alpha error** 0.000000

**beta error** 0.003496

**accuracy** 0.996505

	N	P	L
FALSE	124264	0	436
TRUE	0	0	50