Package ‘FastKNN’

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Type Package

Title Fast k-Nearest Neighbors

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Description Compute labels for a test set according to the k-Nearest Neighbors classification. This is a fast way to do k-Nearest Neighbors classification because the distance matrix between the features of the observations is an input to the function rather than being calculated in the function itself every time.

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Imports pdist, assertthat

NeedsCompilation no

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Distance for KNN Test

The Distance_for_KNN_test returns the distance matrix between the test set and the training set.

**Description**

Distance for KNN Test The Distance_for_KNN_test returns the distance matrix between the test set and the training set.

**Usage**

Distance_for_KNN_test(test_set, train_set)

**Arguments**

- **test_set**: is a matrix where the columns are the features of the test set
- **train_set**: is a matrix with the features of the training set

**Value**

- a distance matrix

**See Also**

- knn_test_function
- pdist

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**k.nearest.neighbors**

_k-Nearest Neighbors_ the k.nearest.neighbors gives the list of points (k-Neighbours) that are closest to the row i in descending order.

**Description**

_k-Nearest Neighbors_ the k.nearest.neighbors gives the list of points (k-Neighbours) that are closest to the row i in descending order.

**Usage**

k.nearest.neighbors(i, distance_matrix, k = 5)

**Arguments**

- **i**: is from the numeric class and is a row from the distance_matrix.
- **distance_matrix**: is a nxn matrix.
- **k**: is from the numeric class and represent the number of neigbours that the function will return.
**knn_test_function**

**Details**

The output of this function is used in the `knn_test_function` function.

**Value**

a k vector with the k closest neighbours to the i observation.

**See Also**

`order`

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```r
knn_test_function(dataset, test, distance, labels, k = 3)
```

**Arguments**

- `dataset` is a matrix with the features of the training set
- `test` is a matrix where the columns are the features of the test set
- `distance` is a nxn matrix with the distance between each observation of the test set and the training set
- `labels` is a nx1 vector with the labels of the training set
- `k` is from the numeric class and represents the number of neighbours to be used in the classifier.

**Value**

a k vector with the predicted labels for the test set.

**See Also**

`k.nearest.neighbors`

`sample`
The `knn_training_function` returns the labels for a training set using the k-Nearest Neighbors Classification method.

### Description

The `knn_training_function` returns the labels for a training set using the k-Nearest Neighbors Classification method.

### Usage

```r
knn_training_function(dataset, distance, label, k = 1)
```

### Arguments

- **dataset**: is a matrix with the features of the training set
- **distance**: is a nxn matrix with the distance between each observation of the training set
- **label**: is a nx1 vector with the labels of the training set
- **k**: is from the numeric class and represent the number of neighbours to be use in the classifier.

### Details

This function is use to check the quality of the Classifier. Because then the predicted labels are compared with the true labels.

### Value

a k vector with the predicted labels for the training set.

### See Also

- `k nearest neighbors`
- `sample`
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