

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` *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`

`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 neighbours that the function will return.

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`

<code>knn_test_function</code>	<i>KNN Test The <code>knn_test_function</code> returns the labels for a test set using the k-Nearest Neighbors Clasification method.</i>
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Description

KNN Test The `knn_test_function` returns the labels for a test set using the k-Nearest Neighbors Clasification method.

Usage

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

Arguments

<code>dataset</code>	is a matrix with the features of the training set
<code>test</code>	is a matrix where the columns are the features of the test set
<code>distance</code>	is a nxn matrix with the distance between each observation of the test set and the training set
<code>labels</code>	is a nx1 vector with the labels of the training set
<code>k</code>	is from the numeric class and represent the number of neighbours to be use in the classifier.

Value

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

See Also

`k.nearest.neighbors`
`sample`

Examples

```
# Create Data for restaurant reviews
training <- matrix(rexp(600,1), ncol=2)
test <- matrix(rexp(200,1), ncol=2)
# Label "Good", "Bad", "Average"
labelsExample <- c(rep("Good",100), rep("Bad",100), rep("Average",100))
# Distance Matrix
distanceExample<-Distance_for_KNN_test(test, training)
# KNN
knn_test_function(training, test, distanceExample,labelsExample, k = 3)
```

knn_training_function *KNN Training The knn_training_function returns the labels for a training set using the k-Nearest Neighbors Clasification method.*

Description

KNN Training The knn_training_function returns the labels for a training set using the k-Nearest Neighbors Clasification method.

Usage

```
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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