

```
> source('~/.active-rstudio-document', echo=TRUE)
```

```
> library(e1071)
```

```
> rb = naiveBayes(as.factor(ACTION) ~ ., data = train)
```

```
> rb$levels
```

```
[1] "0" "1"
```

```
> str(rb)
```

```
List of 4
```

```
$ apriori: 'table' int [1:2(1d)] 1897 30872
```

```
..- attr(*, "dimnames")=List of 1
```

```
.. ..$ Y: chr [1:2] "0" "1"
```

```
$ tables :List of 9
```

```
..$ RESOURCE : num [1:2, 1:2] 42898 42925 35797 34072
```

```
.. ..- attr(*, "dimnames")=List of 2
```

```
.. .. ..$ Y : chr [1:2] "0" "1"
```

```
.. .. ..$ RESOURCE: NULL
```

```
..$ MGR_ID : num [1:2, 1:2] 26738 25943 32239 36142
```

```
.. ..- attr(*, "dimnames")=List of 2
```

```
.. .. ..$ Y : chr [1:2] "0" "1"
```

```
.. .. ..$ MGR_ID: NULL
```

```
..$ ROLE_ROLLUP_1 : num [1:2, 1:2] 117554 116916 6510 11087
```

```
.. ..- attr(*, "dimnames")=List of 2
```

```
.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_ROLLUP_1: NULL

..$ ROLE_ROLLUP_2 : num [1:2, 1:2] 118207 118308 6977 4359

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_ROLLUP_2: NULL

..$ ROLE_DEPTNAME : num [1:2, 1:2] 118834 118918 16208 19118

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_DEPTNAME: NULL

..$ ROLE_TITLE    : num [1:2, 1:2] 127189 125838 35073 30770

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_TITLE: NULL

..$ ROLE_FAMILY_DESC: num [1:2, 1:2] 169179 170240 71651 69376

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_FAMILY_DESC: NULL

..$ ROLE_FAMILY   : num [1:2, 1:2] 183500 183716 111004 99808

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"

.. ..$ ROLE_FAMILY: NULL

..$ ROLE_CODE     : num [1:2, 1:2] 119389 119814 3469 5896

.. .. attr(*, "dimnames")=List of 2

.. ..$ Y      : chr [1:2] "0" "1"
```

```

.. ..$ ROLE_CODE: NULL

$ levels : chr [1:2] "0" "1"

$ call : language naiveBayes.default(x = X, y = Y, laplace = laplace)

- attr(*, "class")= chr "naiveBayes"

> rb

```

Naive Bayes Classifier for Discrete Predictors

Call:

```
naiveBayes.default(x = X, y = Y, laplace = laplace)
```

A-priori probabilities:

Y

	0	1
0	0.05789008	0.94210992
1	0.4289835	0.3579689
1	0.4292549	0.3407225

0.05789008 0.94210992

Conditional probabilities:

RESOURCE

Y [,1] [,2]

0 42898.35 35796.89

1 42925.49 34072.25

MGR_ID

Y [,1] [,2]

0 26737.80 32238.82

1 25942.94 36142.41

ROLE_ROLLUP_1

Y [,1] [,2]

0 117553.7 6509.927

1 116915.7 11086.912

ROLE_ROLLUP_2

Y [,1] [,2]

0 118206.7 6976.744

1 118307.7 4358.893

ROLE_DEPTNAME

Y [,1] [,2]

0 118834.4 16208.25

1 118917.6 19117.78

ROLE_TITLE

Y [,1] [,2]

0 127189.3 35073.30

1 125837.9 30770.07

ROLE_FAMILY_DESC

Y [,1] [,2]

0 169178.9 71651.48

```
1 170239.8 69376.41
```

```
ROLE_FAMILY
```

```
Y    [,1]  [,2]
```

```
0 183499.9 111003.54
```

```
1 183715.9 99808.12
```

```
ROLE_CODE
```

```
Y    [,1]  [,2]
```

```
0 119389.3 3468.899
```

```
1 119814.0 5896.127
```

```
> predictedX<-predict(rb,train)
```

```
> plot(predictedX)
```

```
> table(train$ACTION, predictedX > 0.5)
```

```
< table of extent 2 x 0 >
```

```
> ROCRpred = prediction(predictedX, train$ACTION)
```

```
Error in prediction(predictedX, train$ACTION) :
```

```
Format of predictions is invalid.
```

```
In addition: Warning message:
```

```
In Ops.factor(predictedX, 0.5) : '>' not meaningful for factors
```

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```
..- attr(*, "dimnames")=List of 1
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.. ..$ Y: chr [1:2] "0" "1"
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```
$ tables :List of 9
```

```
..$ RESOURCE      : num [1:2, 1:2] 42898 42925 35797 34072
```

```
.. ..- attr(*, "dimnames")=List of 2
```

```
.. .. ..$ Y      : chr [1:2] "0" "1"
```

```
.. .. ..$ RESOURCE: NULL
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```
..$ MGR_ID        : num [1:2, 1:2] 26738 25943 32239 36142
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.. .. ..$ MGR_ID: NULL
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..$ ROLE_ROLLUP_1 : num [1:2, 1:2] 117554 116916 6510 11087
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```
.. .. ..$ ROLE_ROLLUP_1: NULL
```

```
..$ ROLE_ROLLUP_2 : num [1:2, 1:2] 118207 118308 6977 4359

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_ROLLUP_2: NULL

..$ ROLE_DEPTNAME : num [1:2, 1:2] 118834 118918 16208 19118

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_DEPTNAME: NULL

..$ ROLE_TITLE : num [1:2, 1:2] 127189 125838 35073 30770

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_TITLE: NULL

..$ ROLE_FAMILY_DESC: num [1:2, 1:2] 169179 170240 71651 69376

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_FAMILY_DESC: NULL

..$ ROLE_FAMILY : num [1:2, 1:2] 183500 183716 111004 99808

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_FAMILY: NULL

..$ ROLE_CODE : num [1:2, 1:2] 119389 119814 3469 5896

.. ..- attr(*, "dimnames")=List of 2

.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_CODE: NULL

$ levels : chr [1:2] "0" "1"
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```
$ call : language naiveBayes.default(x = X, y = Y, laplace = laplace)
```

```
- attr(*, "class")= chr "naiveBayes"
```

```
> predictedX<-predict(rb,train)
```

```
> plot(predictedX)
```

```
> # table(train$ACTION, predictedX > 0.5)
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..\$ ROLE_DEPTNAME : num [1:2, 1:2] 118834 118918 16208 19118

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.. ...\$ Y : chr [1:2] "0" "1"

.. ...\$ ROLE_DEPTNAME: NULL

..\$ ROLE_TITLE : num [1:2, 1:2] 127189 125838 35073 30770

.. ..- attr(*, "dimnames")=List of 2

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.. ...\$ ROLE_TITLE: NULL

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.. .. ..$ Y : chr [1:2] "0" "1"

.. .. ..$ ROLE_CODE: NULL

$ levels : chr [1:2] "0" "1"

$ call : language naiveBayes.default(x = X, y = Y, laplace = laplace)

- attr(*, "class")= chr "naiveBayes"

> predictedX<-predict(rb,train)

```

[1] 1
[26] 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[51] 1 0 1
[76] 1 0 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
[101] 1
[126] 1 1 1 1 0 1
[151] 1
[176] 1
[201] 0 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[226] 1 1 1 1 1 1 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1
[251] 1
[276] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1
[301] 0 1
[326] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1
[351] 1
[376] 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 1 1 1 1 1
[401] 1 1 1 1 1 1 1 0 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1
[426] 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1
[451] 1 1 1 1 0 1
[476] 1 0 1 1
[501] 1 0 1 1 1 1 1
[526] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1
[551] 1

[576] 1
[601] 1 0
[626] 1 1 1 1 1 1 1 1 1 1 0 0 1 0 1 1 1 1 1 1 1 1 1 1
[651] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1
[676] 1
[701] 0 1
[726] 1
[751] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1
[776] 1 0 1 0
[801] 1 0 1 1 1
[826] 1
[851] 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[876] 1
[901] 1 0 1
[926] 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1
[951] 1
[976] 1
[1001] 1
[1026] 1
[1051] 1
[1076] 0 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1
[1101] 0 1
[1126] 1
[1151] 1
[1176] 1

[1201] 1
[1226] 1
[1251] 1
[1276] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1
[1301] 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[1326] 1
[1351] 1 1 0 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1
[1376] 1 1 0 1
[1401] 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 0 1 1 1 1 1 0
[1426] 1
[1451] 1
[1476] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1
[1501] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1
[1526] 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1
[1551] 1 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[1576] 1 0 1 1
[1601] 1
[1626] 1
[1651] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1
[1676] 1 1 0 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
[1701] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 0 1 1 1 1
[1726] 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[1751] 1 1 1 1 1 0 1
[1776] 1
[1801] 1 0 1 1

[1826] 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[1851] 1 0 1
[1876] 1
[1901] 1
[1926] 1
[1951] 1
[1976] 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 0 1 1 1 1 0 1 0 1 1
[2001] 1
[2026] 1 0 1
[2051] 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[2076] 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1
[2101] 1 0 1 1
[2126] 0 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 0
[2151] 1
[2176] 1 0
[2201] 1
[2226] 1
[2251] 1
[2276] 1 1 1 0 1
[2301] 1
[2326] 1
[2351] 1
[2376] 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 0
[2401] 1 1 0 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
[2426] 1

[2451] 1
[2476] 1
[2501] 1
[2526] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1
[2551] 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[2576] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1
[2601] 1 1 1 0 1
[2626] 1
[2651] 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[2676] 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[2701] 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1
[2726] 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[2751] 1
[2776] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1
[2801] 1 1 1 1 0 0 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1
[2826] 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1
[2851] 1
[2876] 1
[2901] 1
[2926] 1
[2951] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1
[2976] 1 1 1 0 1
[3001] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1
[3026] 1
[3051] 1

[3076] 1
[3101] 1
[3126] 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1
[3151] 1 0 1
[3176] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1
[3201] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1
[3226] 1
[3251] 1
[3276] 1 1 0 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3301] 1
[3326] 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 1 1 1 1 1
[3351] 1
[3376] 1
[3401] 1
[3426] 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3451] 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1
[3476] 1 1 0 1
[3501] 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3526] 1
[3551] 1
[3576] 1 1 0 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3601] 0 1
[3626] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 0
[3651] 1 1 1 0 1
[3676] 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1

[3701] 1 1 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
[3726] 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1
[3751] 1
[3776] 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3801] 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 0 1 0 1 1 0 1
[3826] 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3851] 1 0 1 1 1 1 1
[3876] 1
[3901] 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[3926] 1
[3951] 1
[3976] 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1
[4001] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1
[4026] 1
[4051] 1 1 1 1 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1
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[4201] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1
[4226] 1 0 1 1 1 1
[4251] 1
[4276] 1 1 1 1 0 1
[4301] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1

[illegible]

[4951] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1
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