# Package 'rpart.utils'

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**Title** Tools for parsing and manipulating rpart objects, including generating machine readable rules.

**Version** 0.5

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**Description** This package contains additional tools for working with rpart objects. Most importantly, it includes methods for converting rpart rules into a series of structured tables sufficient for executing the decision tree completely in SQL.

**Depends** R (>= 3.1.0), rpart

**Suggests** RODBC

**License** GPL-3

**LazyData** true

**NeedsCompilation** no

**Repository** CRAN

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## R topics documented:

## rpart.lists — *Creates lists of variable values (factor levels) associated with each rule in an* **rpart** *object.*

### Description

Creates lists of variable values (factor levels) associated with each rule in an **rpart** object.

### Usage

```
rpart.lists(object)
```

### Arguments

| | |
|---|---|
| object | an rpart object |

### Value

a list of lists

### Examples

```
library(rpart)
fit<-rpart(Reliability~.,data=car.test.frame)
rpart.lists(fit)
```

## rpart.rules — *Returns a list of strings summarizing the branch path to each node.*

### Description

Returns a list of strings summarizing the branch path to each node.

### Usage

```
rpart.rules(object)
```

### Arguments

| | |
|---|---|
| object | an rpart object |

### Examples

```
library(rpart)
fit<-rpart(Reliability~.,data=car.test.frame)
rpart.rules(fit)
```

`rpart.rules.push` *Writes rule tables required to process rpart rules in SQL to an open RODBC connection.*

## Description

This function handles the process of pushing tabular versions of **rpart** rules to an RODBC connection. The entire process of generation and writing is completed with a single call, with all necessary subcalls handled within this function.

## Usage

```
rpart.rules.push(object, connection, rulePrefix = NULL, tablePrefix = NULL)
```

## Arguments

| | |
|---|---|
| `object` | an rpart object |
| `connection` | and open RODBC connection |
| `rulePrefix` | A character string to prepend to each rule name to allow for multiple rule sets |
| `tablePrefix` | A character string to prepend to each table name to allow for multiple rule sets |

## Details

Once the tables have been pushed to the database, unpivoted source data can be processed using the rpart model with SQL code similar to the following:

```
WITH SOURCE AS
(
    SELECT
    ID,
    TYPE,
    VALUE
    FROM DATA
    UNPIVOT
    (
        VALUE FOR TYPE IN (FIELD1, FIELD2, FIELD3)
    )UNPVT
),
MATCHES AS
(
    SELECT
    ID
    ,Subrule
    ,Variable
    ,SR.Value
    ,Less
```

```
    ,Greater
    FROM
    SOURCE S
    LEFT JOIN SUBRULES SR
    ON
    TYPE = VARIABLE
    AND (
        S.value = SR.value
        OR S.value < SR.Less
        OR S.value > SR.Greater
        )
    ),
MATCHED_SUBRULES
AS (
    SELECT
    Subrule
    ,ID
    FROM
    MATCHES M
    GROUP BY
    Subrule
    ,ID
    ),
MATCHED_RULES
AS (
    SELECT
    R.[Rule]
    ,MS.*
    FROM
    RULES AS R
    LEFT JOIN MATCHED_SUBRULES MS
    ON R.SUBRULE=MS.SUBRULE AND Leaf='TRUE'
    )
,
COUNTS AS
(
    SELECT
    [RULE]
    ,ID
    ,MATCH_COUNT=COUNT(DISTINCT SUBRULE)
   ,NEEDED_COUNT=(SELECT COUNT(DISTINCT SUBRULE) FROM RULES R WHERE R.[RULE]=MR.[RULE])
    FROM
    MATCHED_RULES MR
    GROUP BY
    [RULE]
    ,ID
    )
SELECT
```

```
RULE
,ID
FROM COUNTS
WHERE
MATCH_COUNT=NEEDED_COUNT
```

The frame is also passed to the database which allows extracting the estimates generated by the rpart model.

---

`rpart.rules.table` *Returns an unpivoted table of branch paths (subrules) associated with each node.*

---

## Description

Returns an unpivoted table of branch paths (subrules) associated with each node.

## Usage

```
rpart.rules.table(object)
```

## Arguments

| | |
|---|---|
| `object` | an rpart object |

## Examples

```
library(rpart)
fit<-rpart(Reliability~.,data=car.test.frame)
rpart.rules.table(fit)
```

---

`rpart.subrules.table` *Returns an unpivoted table of variable values (factor levels) associated with each branch.*

---

## Description

Returns an unpivoted table of variable values (factor levels) associated with each branch.

## Usage

```
rpart.subrules.table(object)
```

## Arguments

| | |
|---|---|
| `object` | an rpart object |

## Examples

```
library(rpart)
fit<-rpart(Reliability~.,data=car.test.frame)
rpart.subrules.table(fit)
```

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