

Installation et gestion des packages sous R

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Packages

Pourquoi, comment ?

Package ?

- Un package est une bibliothèque externe
- Sous Windows → fichiers binaires pré-compilés
- Extension .zip
- Il est toujours documenté : fichier HTML (aide sous R) et PDF

Quel intérêt ?

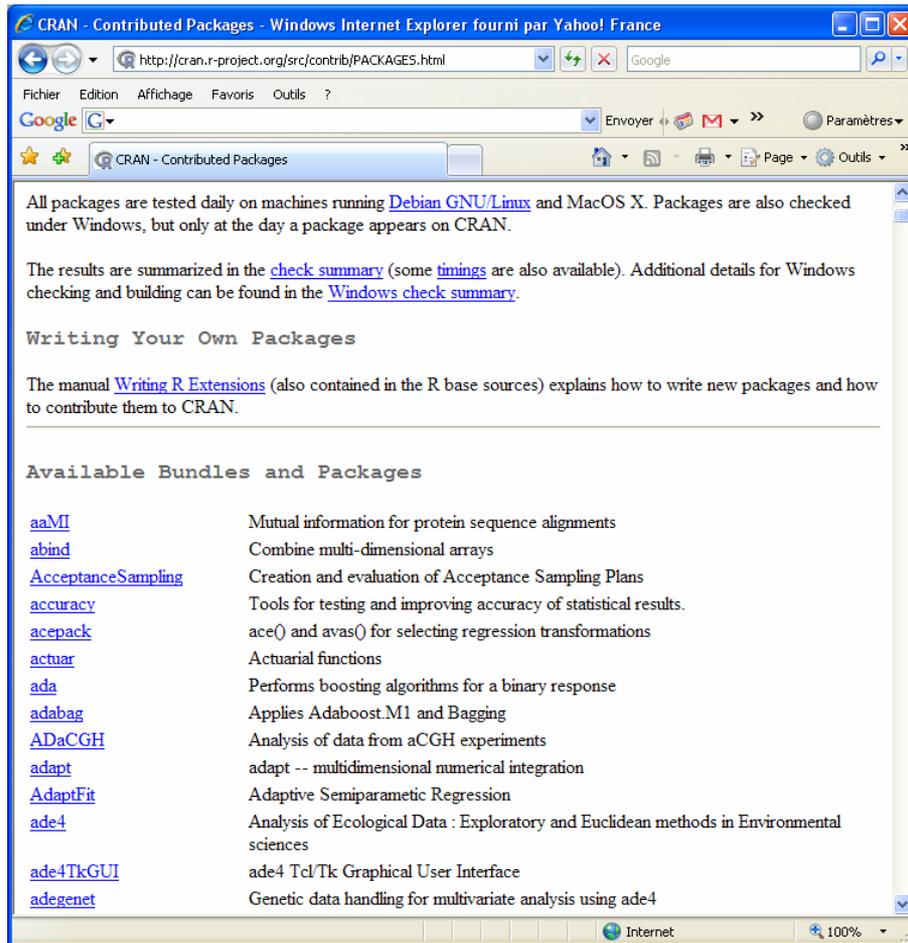
- Un package contient des collections de fonctions utilisables sous R
- Souvent centrés sur un sujet particulier (ex. *rpart* pour les arbres de décision, etc.)
- Gestion affinée des packages : nous pouvons les installer, désinstaller, charger, décharger et mettre à jour à notre guise

Ce système permet d'augmenter considérablement la puissance de R !!!

Objectif de ce support

- Localiser un package qui nous intéresse
- L'installer (et le désinstaller) sur notre machine
- Le charger (et le décharger)
- Accéder à l'aide et la documentation
- Faire appel aux fonctions du package

Disponible sur le site : <http://cran.r-project.org/src/contrib/PACKAGES.html>



CRAN - Contributed Packages - Windows Internet Explorer fourni par Yahoo! France

<http://cran.r-project.org/src/contrib/PACKAGES.html>

All packages are tested daily on machines running [Debian GNU/Linux](#) and MacOS X. Packages are also checked under Windows, but only at the day a package appears on CRAN.

The results are summarized in the [check summary](#) (some [timings](#) are also available). Additional details for Windows checking and building can be found in the [Windows check summary](#).

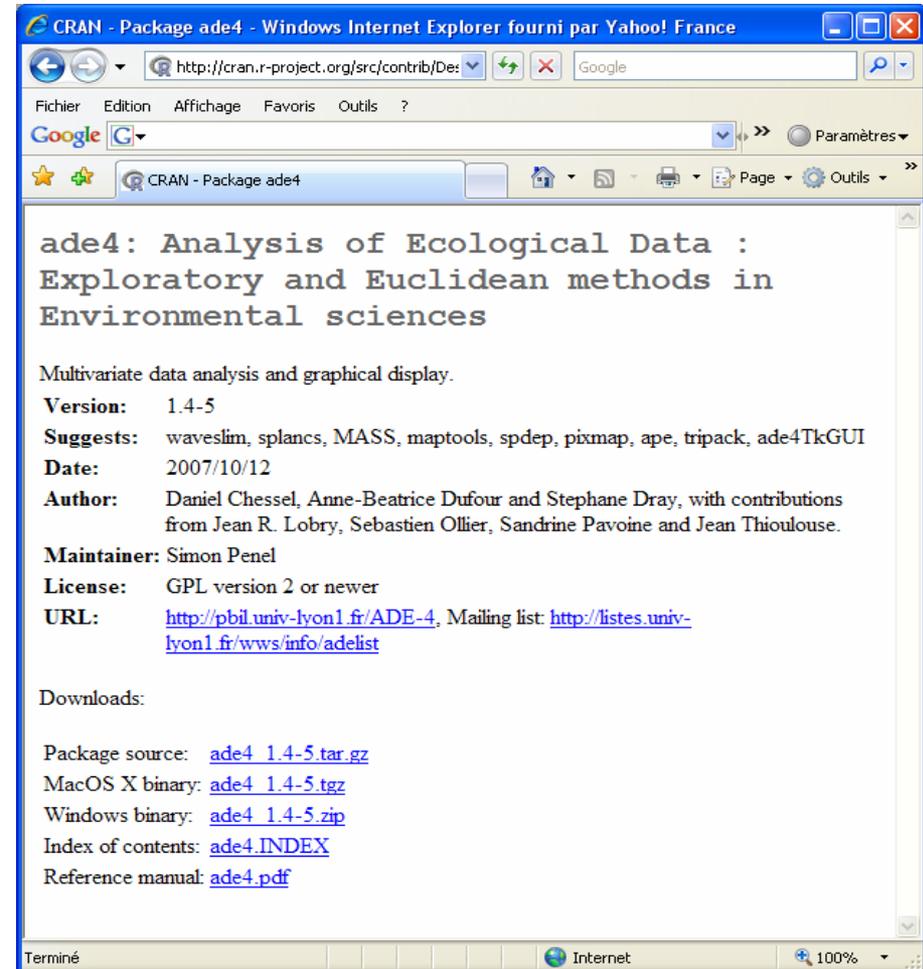
Writing Your Own Packages

The manual [Writing R Extensions](#) (also contained in the R base sources) explains how to write new packages and how to contribute them to CRAN.

Available Bundles and Packages

aaMI	Mutual information for protein sequence alignments
abind	Combine multi-dimensional arrays
AcceptanceSampling	Creation and evaluation of Acceptance Sampling Plans
accuracy	Tools for testing and improving accuracy of statistical results.
acepack	ace() and avas() for selecting regression transformations
actuar	Actuarial functions
ada	Performs boosting algorithms for a binary response
adabag	Applies Adaboost.M1 and Bagging
ADaCGH	Analysis of data from aCGH experiments
adapt	adapt -- multidimensional numerical integration
AdaptFit	Adaptive Semiparametric Regression
ade4	Analysis of Ecological Data : Exploratory and Euclidean methods in Environmental sciences
ade4TkGUI	ade4 Tcl/Tk Graphical User Interface
adegenet	Genetic data handling for multivariate analysis using ade4

A chaque package correspond une série de fichiers, dont la documentation PDF



CRAN - Package ade4 - Windows Internet Explorer fourni par Yahoo! France

<http://cran.r-project.org/src/contrib/De>

ade4: Analysis of Ecological Data : Exploratory and Euclidean methods in Environmental sciences

Multivariate data analysis and graphical display.

Version: 1.4-5

Suggests: waveslim, splancs, MASS, mapprobs, spdep, pixmap, ape, tripack, ade4TkGUI

Date: 2007/10/12

Author: Daniel Chessel, Anne-Beatrice Dufour and Stephane Dray, with contributions from Jean R. Lobry, Sebastien Ollier, Sandrine Pavoine and Jean Thioulouse.

Maintainer: Simon Penel

License: GPL version 2 or newer

URL: <http://pbil.univ-lyon1.fr/ADE-4>, Mailing list: <http://listes.univ-lyon1.fr/wvs/info/adelist>

Downloads:

Package source: [ade4 1.4-5.tar.gz](#)

MacOS X binary: [ade4 1.4-5.tgz](#)

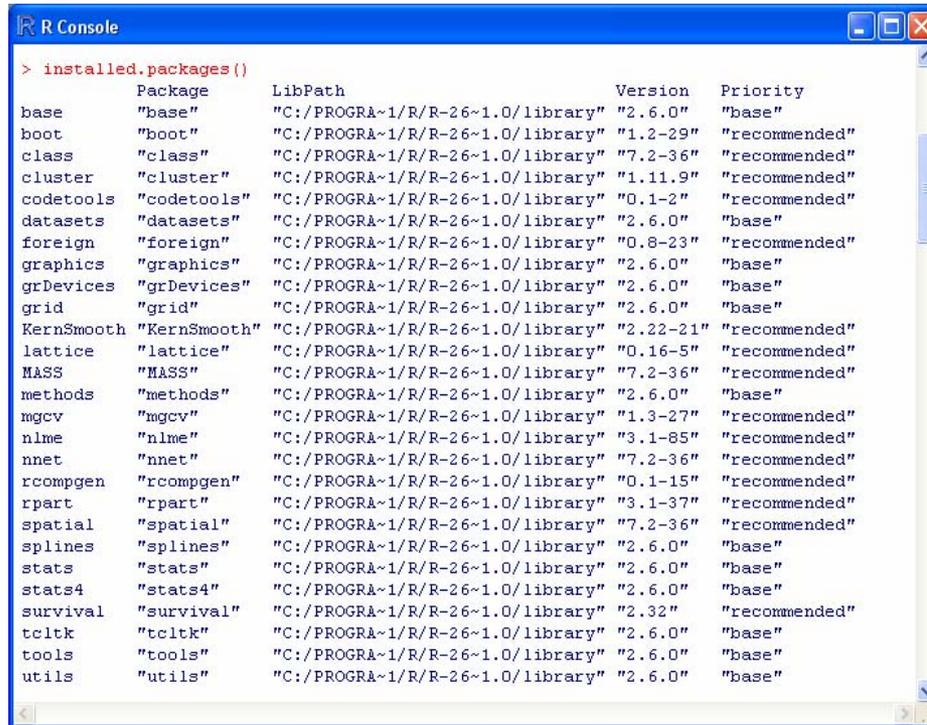
Windows binary: [ade4 1.4-5.zip](#)

Index of contents: [ade4.INDEX](#)

Reference manual: [ade4.pdf](#)

Les packages de notre configuration

Obtenir la liste des packages installés sur notre machine



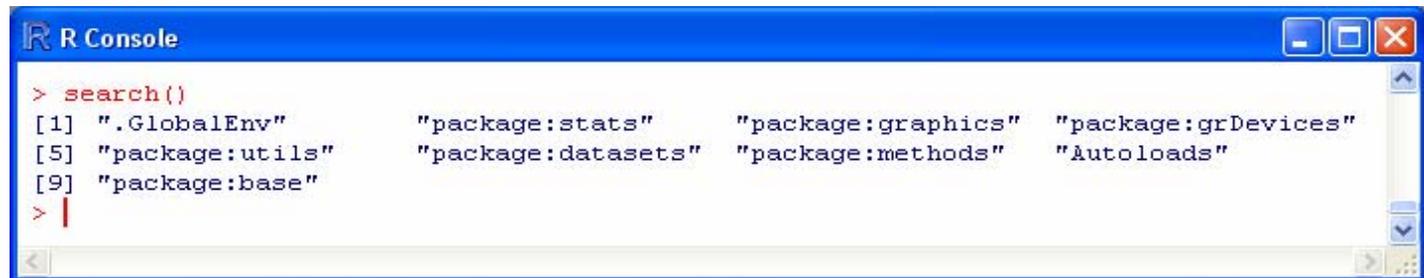
```
> installed.packages()
  Package      LibPath          Version  Priority
base          "base"           "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0" "base"
boot          "boot"           "C:/PROGRA~1/R/R-26~1.0/library" "1.2-29" "recommended"
class         "class"          "C:/PROGRA~1/R/R-26~1.0/library" "7.2-36" "recommended"
cluster       "cluster"        "C:/PROGRA~1/R/R-26~1.0/library" "1.11.9" "recommended"
codetools     "codetools"      "C:/PROGRA~1/R/R-26~1.0/library" "0.1-2"  "recommended"
datasets      "datasets"       "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
foreign       "foreign"        "C:/PROGRA~1/R/R-26~1.0/library" "0.8-23" "recommended"
graphics      "graphics"       "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
grDevices     "grDevices"      "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
grid          "grid"           "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
KernSmooth    "KernSmooth"     "C:/PROGRA~1/R/R-26~1.0/library" "2.22-21" "recommended"
lattice       "lattice"        "C:/PROGRA~1/R/R-26~1.0/library" "0.16-5" "recommended"
MASS          "MASS"           "C:/PROGRA~1/R/R-26~1.0/library" "7.2-36" "recommended"
methods       "methods"        "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
mgcv          "mgcv"           "C:/PROGRA~1/R/R-26~1.0/library" "1.3-27" "recommended"
nlme          "nlme"           "C:/PROGRA~1/R/R-26~1.0/library" "3.1-85" "recommended"
nnet          "nnet"           "C:/PROGRA~1/R/R-26~1.0/library" "7.2-36" "recommended"
rcompngen     "rcompngen"      "C:/PROGRA~1/R/R-26~1.0/library" "0.1-15" "recommended"
rpart         "rpart"          "C:/PROGRA~1/R/R-26~1.0/library" "3.1-37" "recommended"
spatial       "spatial"        "C:/PROGRA~1/R/R-26~1.0/library" "7.2-36" "recommended"
splines       "splines"        "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
stats         "stats"          "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
stats4        "stats4"         "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
survival      "survival"       "C:/PROGRA~1/R/R-26~1.0/library" "2.32"   "recommended"
tcltk        "tcltk"          "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
tools        "tools"          "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
utils        "utils"          "C:/PROGRA~1/R/R-26~1.0/library" "2.6.0"  "base"
```

Des informations complémentaires sont fournies :

- Description succincte
- Dépendances (!)
- Etc.

> **library()** permet aussi de lister les packages installés

Obtenir la liste des packages chargés

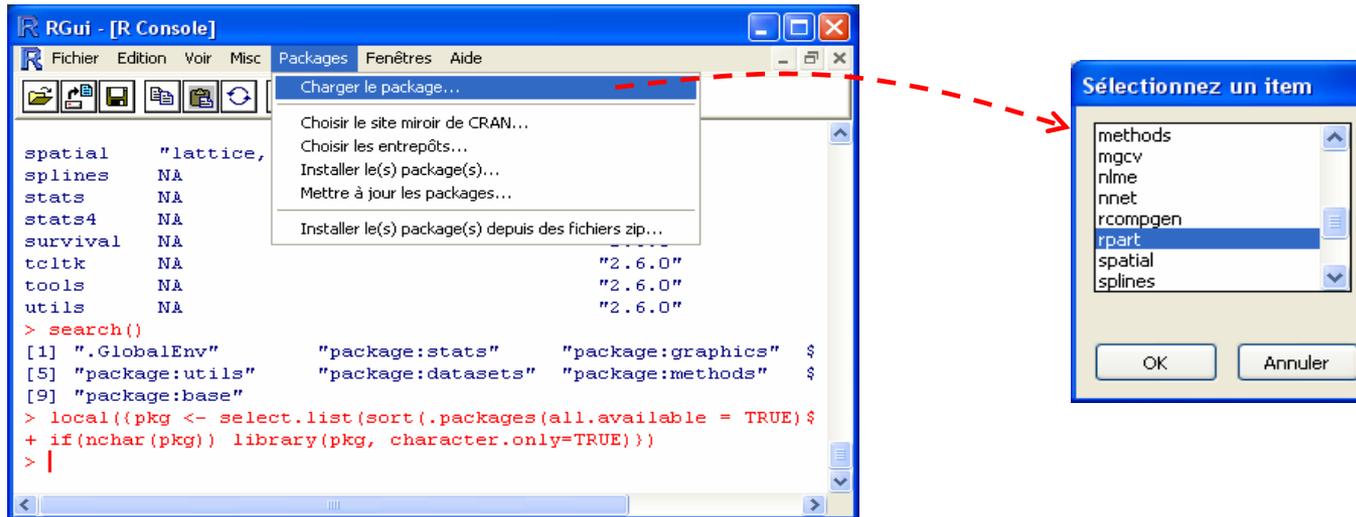


```
> search()
[1] ".GlobalEnv"           "package:stats"      "package:graphics"  "package:grDevices"
[5] "package:utils"       "package:datasets"  "package:methods"   "Autoloads"
[9] "package:base"
> |
```

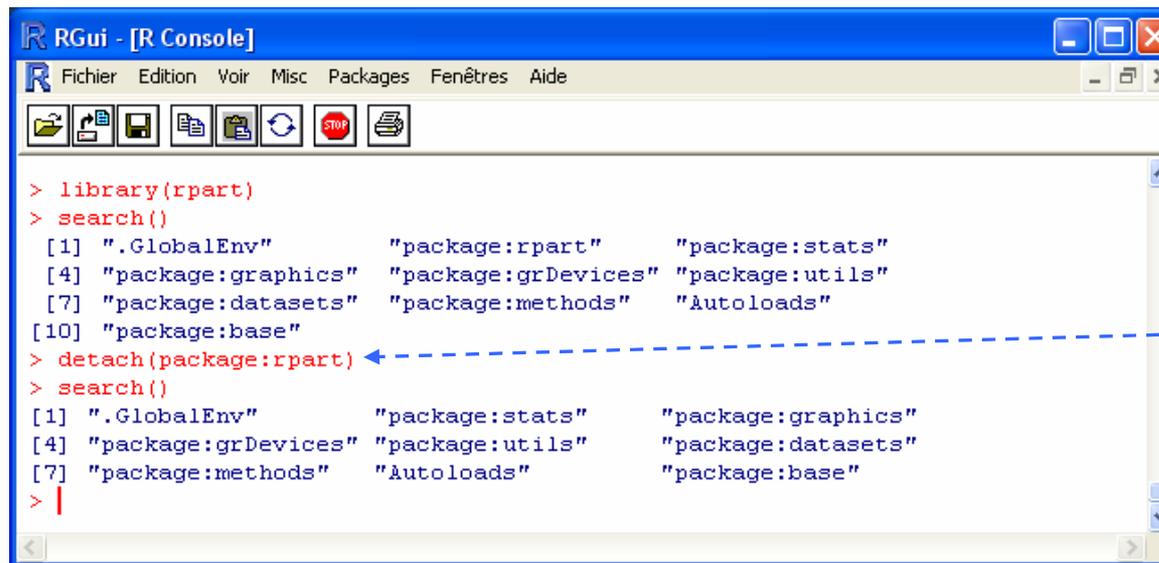
Charger un package déjà installé

(ex. le package rpart pour construire des arbres de décision)

Utiliser les menus



Utiliser la ligne de commande



On peut « décharger » un package (pour éviter les conflits entre fonctions de packages différents par ex.)

Obtenir de l'aide sur un package

Liste des fonctions, syntaxe des fonctions, etc.

- (1) En chargeant la documentation PDF (le plus simple et le plus recommandé)
- (2) En insérant les commandes adéquates dans R

- #obtenir la liste des fonctions
- `library(help=rpart)`
- `help(package=rpart)`

```
Documentation pour le package 'rpart'

Description :

Package:      rpart
Priority:     recommended
Version:     3.1-37
Date:       March 2002 version of rpart, R version 2007-07-26
Author:      Terry M Therneau and Beth Atkinson
             <atkinson@mayo.edu>. R port by Brian Ripley
             <ripley@stats.ox.ac.uk>.
Maintainer:  Brian Ripley <ripley@stats.ox.ac.uk>
Description: Recursive partitioning and regression trees
Title:       Recursive Partitioning
Depends:     R (>= 2.4.0), graphics, stats, grDevices
Suggests:   survival
License:     GPL-2, or see file LICENCE
LazyData:   yes
URL:        S-PLUS 6.x original at
             http://mayoresearch.mayo.edu/mayo/research/biostat/splusfunc/
Packaged:   Thu Jul 26 09:02:29 2007; ripley
Built:      R 2.6.0; i386-pc-mingw32; 2007-10-03 07:53:56;
             windows

Index :

car.test.frame      Automobile Data from 'Consumer Repo
cu.summary          Automobile Data from 'Consumer Repo
kyphosis            Data on Children who have had Corre
                    Spinal Surgery
labels.rpart        Create Split Labels For an Rpart Obj
meanvar.rpart       Mean-Variance Plot for an Rpart Obj
na.rpart            Handles Missing Values in an Rpart
```

- #obtenir de l'aide sur une fonction du package
- `help(rpart,package=« rpart »)`
- #si le package est chargé, pas besoin de le spécifier
- `help(rpart)`

```
rpart(rpart)                                R Documentation

Recursive Partitioning and
Regression Trees

Description
Fit a rpart model

Usage
rpart(formula, data, weights, subset, na.action = na.rpart, metho
      model = FALSE, x = FALSE, y = TRUE, parms, control, cost, .

Arguments
formula  a formula, as in the lm function.
data     an optional data frame in which to interpret the variables named in the
         formula
weights  optional case weights.
subset   optional expression saying that only a subset of the rows of the data
         should be used in the fit.
na.action The default action deletes all observations for which y is missing, but
         keeps those in which one or more predictors are missing.
method   one of "anova", "poisson", "class" or "exp". If method is
         missing then the routine tries to make an intelligent guess. If y is a
         survival object, then method="exp" is assumed, if y has 2 columns
         then method="poisson" is assumed, if y is a factor then
         method="class" is assumed, otherwise method="anova" is
         assumed. It is wisest to specify the method directly, especially as more
         criteria are added to the function.
         Alternatively, method can be a list of functions named init, split
         and eval. Examples are given in the file
```

Exemple d'utilisation du package rpart

Code source

```
#charger les données dispo dans le package "rpart"
data(car.test.frame)

#aperçu des données
summary(car.test.frame)

#arbre de régression
arbre <- rpart(Price ~ ., method = "anova", data = car.test.frame)

#arbre sous forme textuelle
print(arbre)

#arbre sous forme graphique
plot(arbre)
text(arbre)
```

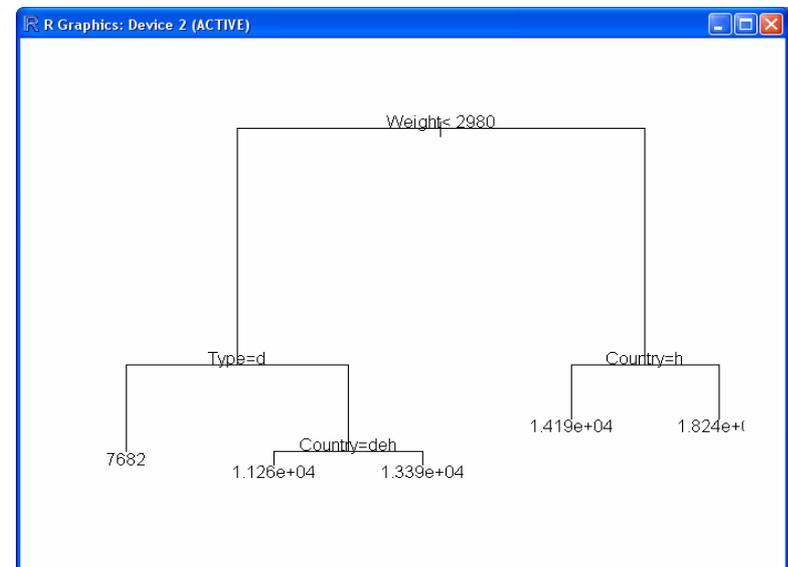
Sortie texte

```
R Console
>
> #arbre sous forme textuelle
> print(arbre)
n= 60

node), split, n, deviance, yval
 * denotes terminal node

1) root 60 983551500 12615.670
 2) Weight< 2980 36 283686500 10442.580
   4) Type=Small 13 21804710 7682.385 *
   5) Type=Compact,Medium,Sporty 23 106857900 12002.700
     10) Country=Japan/USA,Korea,USA 15 21272980 11261.200 *
     11) Country=France,Germany,Japan 8 61874100 13393.000 *
   3) Weight>=2980 24 274858800 15875.290
     6) Country=USA 14 47843040 14185.710 *
     7) Country=Japan,Sweden 10 131098800 18240.700 *
```

Sortie graphique



Installer un nouveau package

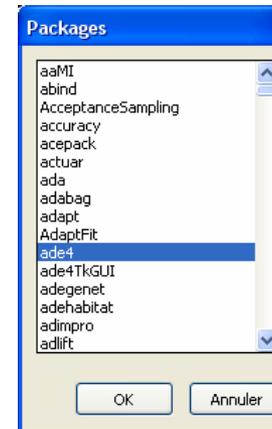
Ex. Package ade4 pour l'analyse de données

1 - Menu « Packages / Choisir le site miroir CRAN »
(pas trop loin si possible)



2 - Menu « Packages / Installer des packages »

```
R Console
> installed.packages()
  Package      LibPath      Version  Priority
ade4         "ade4"       "1.4-5"   NA
base         "base"       "2.6.0"   "base"
boot         "boot"       "1.2-29"  "recommended"
class        "class"      "7.2-36"  "recommended"
cluster      "cluster"    "1.11.9"  "recommended"
codetools    "codetools"  "0.1-2"   "recommended"
datasets     "datasets"   "2.6.0"   "base"
foreign      "foreign"    "0.8-23"  "recommended"
graphics     "graphics"   "2.6.0"   "base"
grDevices    "grDevices"  "2.6.0"   "base"
grid         "grid"       "2.6.0"   "base"
KernSmooth   "KernSmooth" "2.22-21" "recommended"
lattice      "lattice"    "0.16-5"  "recommended"
MASS         "MASS"       "7.2-36"  "recommended"
```



3 - Menu « Packages / Mettre à jour les packages »
Pour obtenir la dernière version des packages déjà installés

- Il y a (presque) toujours un package adapté à nos problèmes
- Nous pouvons programmer dans R pour compléter les fonctions
- Nous pouvons programmer de nouveaux packages distribuables