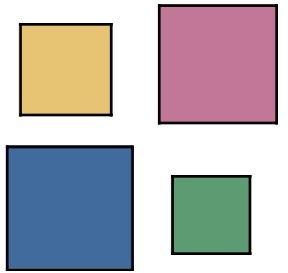




**JGR** – A unified interface to R

Markus Helbig, Simon Urbanek and Martin Theus – Augsburg University – [www.rosuda.org](http://www.rosuda.org)



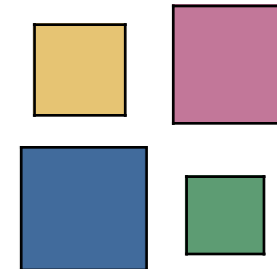
# JGR

## A unified interface to R

Markus Helbig  
Simon Urbanek  
Martin Theus

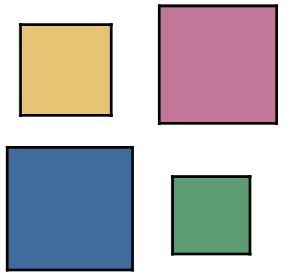
–

Augsburg University



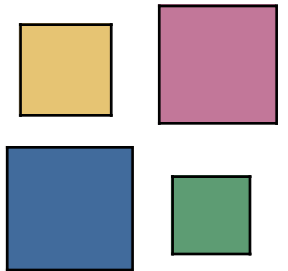
## What is JGR?

- **Java GUI for R** – speak Jaguar
- Graphical User Interface for R written in Java
- **JGR** tools:
  - Console Window
  - Editor
  - Object Browser
  - Spread Sheet
  - Package Manager
  - Help System
- **JGR** features:
  - Syntax Highlighting
  - Drag & Drop
  - Auto Completion
    - Commands
    - Objects
    - Files
  - Quick Hints



## Why JGR?

- **R** is the acclaimed standard for statistical computing
- The **R** language is consistent between platforms ...
- ... the interface isn't!  
(forget about shell users ...)
- Great discrepancies between GUIs on different platforms
- “**R**-environments” tend to be **very** user-specific  
(the probability that two user**R**s or programmer**R**s on a UNIX box use the same setting is almost 0)
- **R** in teaching:
  - Pure console deterring for today's novice user
  - GUI shall support work with R, not be a challenge in itself
  - Platform independence makes instructions universal

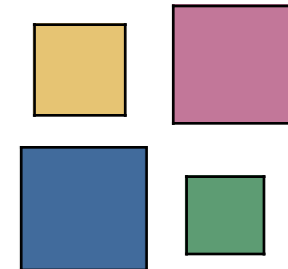


## JGR talks to R

- Communication with R is somewhat hard
  - Standard In/Out
  - Run as a library of R or run R as a library
  - ...
- **JGR**
  - **JGR** to **R**: JRI (using JNI)
  - **R** to **JGR**: RJava
  - see Simon to learn the latest news ...
- **JavaGD**

A platform independent GUI should rather rely on a platform independent graphics device than on the native graphics device.

**JavaGD** is a R graphics device written in Java.



# JGR - Console

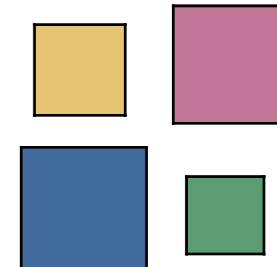
```
Console  
[1,] 0.5257311 0.8506508  
[2,] -0.8506508 0.5257311  
  
> vc <- matrix(c(2, -3, -3, 5), ncol=2)  
eigen(vc)  
  
$values  
[1] 6.8541020 0.1458980  
  
$vectors  
      [,1] [,2]  
[1,] 0.5257311 0.8506508  
[2,] -0.8506508 0.5257311  
  
> vc <- matrix(c(4, -3, -3, 5), ncol=2)  
eigen(vc)  
  
$values  
[1] 7.541381 1.458619  
  
$vectors  
      [,1] [,2]  
[1,] -0.6463749 0.7630200  
[2,] 0.7630200 0.6463749  
  
>  
read.table("Documents/Datasets/|
```

Input-  
Output-Area

Syntax  
Highlighting

Multi Line  
History

Auto  
Completion



# JGR - Editor

Syntax-  
Highlighting

Quick-Hints

Brace  
Matching

Command-  
Transfer

```
Editor - /Volumes/Projects/theusm/Documents/Vorlesungen
[Icons: File, Save, Undo, Redo, Cut, Copy, Paste, Find, Help]

xx<-palmitoleic
yy<-oleic
plot(xx, yy, xlim=c(-10,300))
vc<-matrix(c(var(xx), cov(xx, yy), cov(xx, yy),
var(yy)), ncol=2, byrow=T)
#vc<-matrix(c(1,0.9,0.9,1), ncol=2, byrow=T)
evc<-eigen(vc)
vc2<-(evc$eigenvalues)%*%diag(sqrt(evc$eigenvalues))%*%t(evc$eigenvalues)

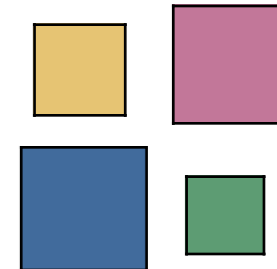
y<-eigen(x, symmetric, only.values = FALSE, EISPACK = FALSE)
y<-y
norm1<-cbind(rep(0.8,100),y)
y<-f.gen.sphere(100,2)*sqrt(qchisq(0.8,2))
y<-y%*%vc2
norm1<-rbind(norm1, rep(NA, 3))
norm1<-rbind(norm1,cbind(rep(0.8,100),y))
y<-f.gen.sphere(100,2)*sqrt(qchisq(0.95,2))
y<-y%*%vc2
norm1<-rbind(norm1, rep(NA, 3))
norm1<-rbind(norm1,cbind(rep(0.95,100),y))
y<-f.gen.sphere(100,2)*sqrt(qchisq(0.99,2))
y<-y%*%vc2
norm1<-rbind(norm1, rep(NA, 3))
norm1<-rbind(norm1,cbind(rep(0.99,100),y))

#plot(norm1[,2], norm1[,3], type="n")

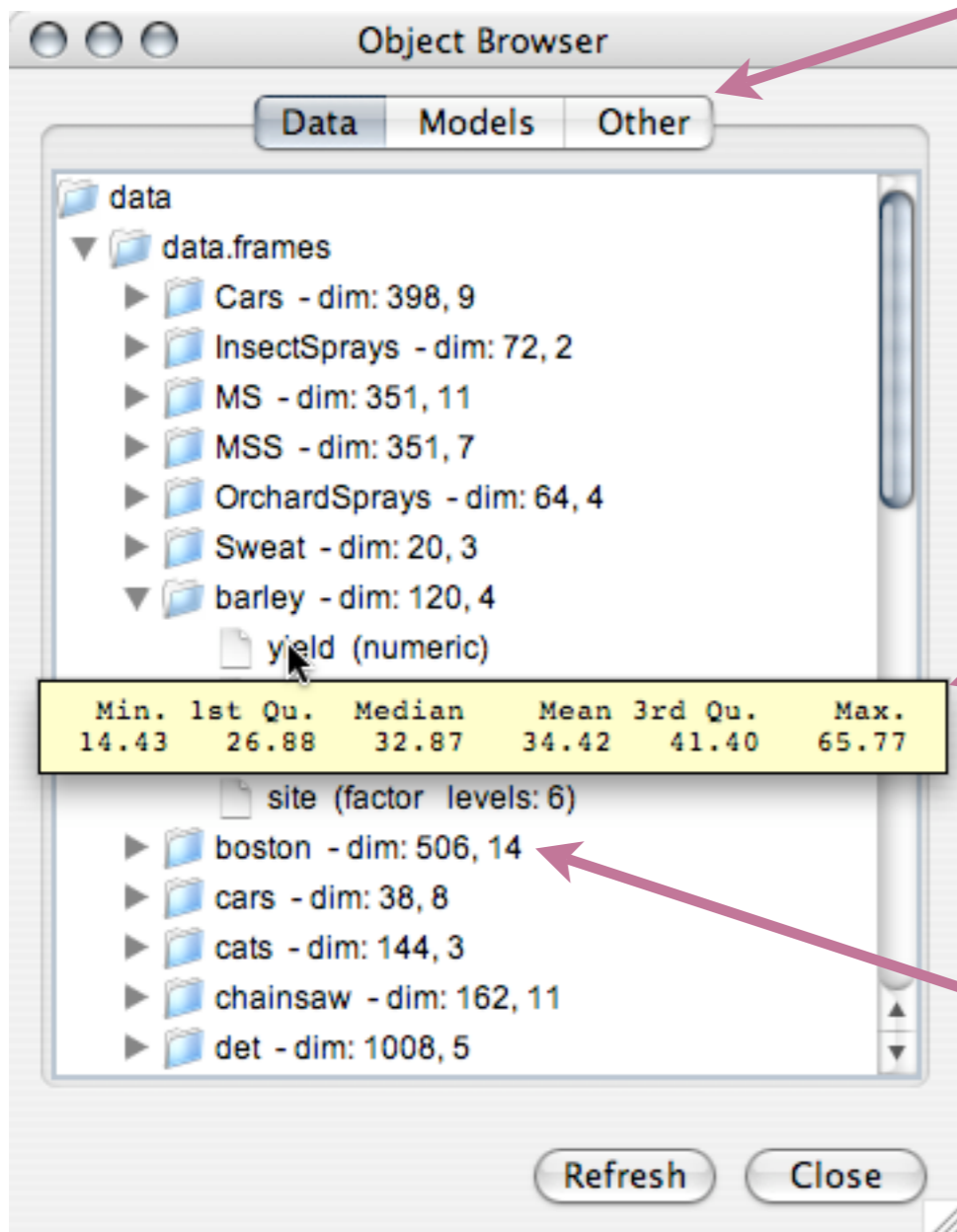
lines(mean(xx)+norm1[,2], mean(yy)+norm1[,3])

text(mean(xx)+norm1[(0:3)*201+1,2],mean(yy)+norm1[(0:3)*201+1,3], norm1[(0:3)*201+1,1])

Modified 28:1
```



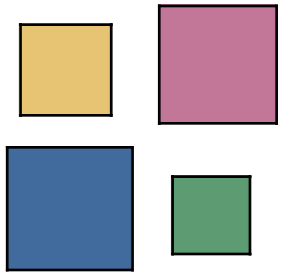
# JGR – Object Browser



Tabs for different data types

Quick-Hints

Hierarchic Display



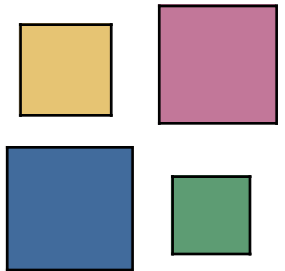
# JGR – Object Browser

Column  
Sorting

Quick-Hints

## Model Browser

Name	Data	Type	family	df	r.squared	aic	deviance
cm	cars	lm		2	0.79		
cm0		lm		1	0.0		
cm1		lm		2	0.86		
cm2		lm		3	0.92		
cm3	cars	lm		4	0.93		
lm.D9		lm		2	0.07		
lm.D90		lm		2	0.98		
lm1	swiss	lm		6	0.71		
lw	warpbr...	lm		4	0.27		
slm1	swiss	lm		5	0.7		
m1		glm	gaussian			-98.92	3.36
detg.m0		glm	poisson			191.24	32.83
bwt.glm.st...		glm	binomial			219.21	205.21
bwt.glm		glm	binomial			222.19	204.19



## JGR – Spread Sheet

Works on data.frames and matrices

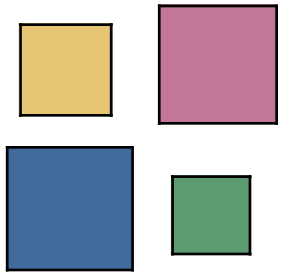
Editing includes inserting and deleting rows and columns, as well as renaming columns

Auto append line for fast data entry

Sorting on columns

	SWEAT	SODIUM	POTASS
1	3.7	48.5	9.3
2	5.7	65.1	8.0
3	3.8	47.2	10.9
4	3.2	53.2	12.0
5	3.1	55.5	9.7
6	4.6	36.1	7.9
7	2.4	24.8	14.0
8	7.2	33.1	7.6
9	6.7	47.4	8.5
10	5.4	54.1	11.3
11	3.9	36.9	12.7
12	4.5	58.8	12.3
13	3.5	27.8	9.8
14	4.5	40.2	8.4
15	1.5	13.5	10.1
16	8.5	56.4	7.1
17	4.5	71.6	8.2
18	6.5	52.8	10.9
19	4.1	44.1	11.2
20	5.5	40.9	9.4

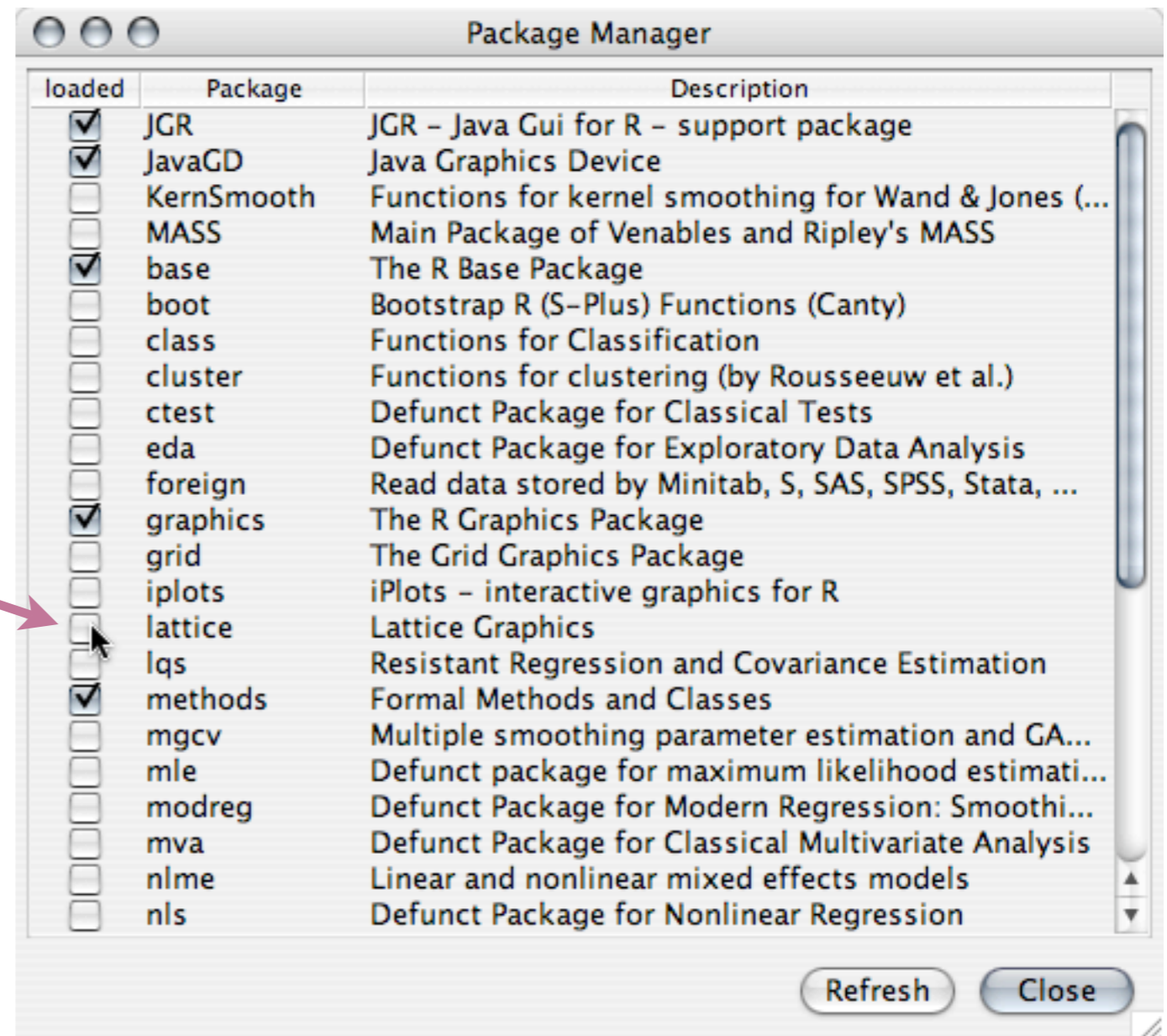
Update

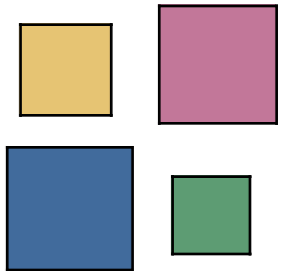


# JGR – Package Manager

Load and  
unlaod  
Packages

(default package  
management to come)



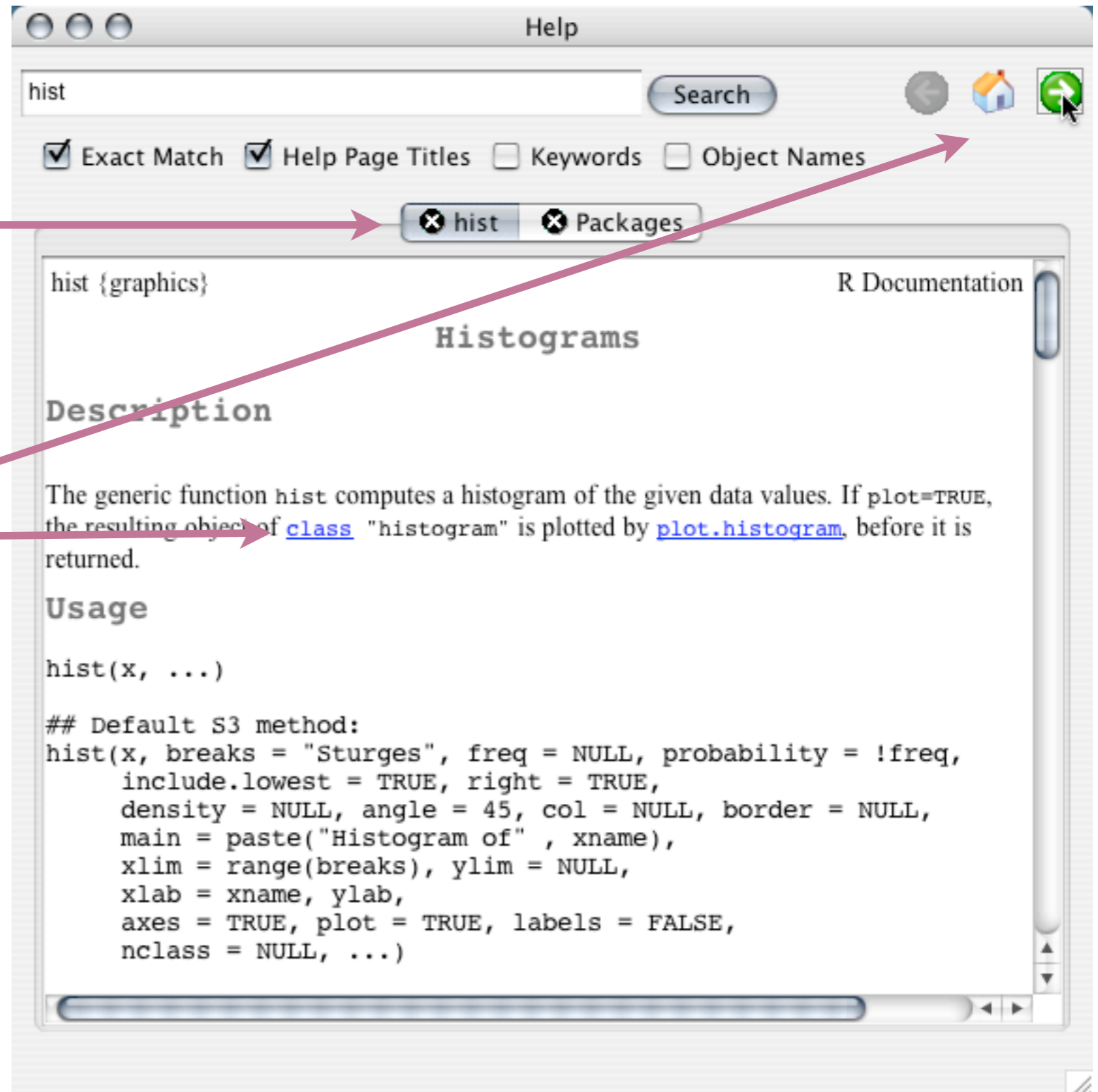


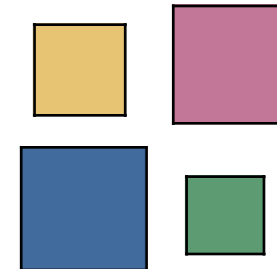
# Help System

Tabbed-Browsing

Full HTML Integration

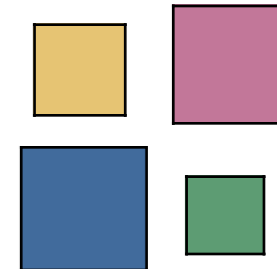
One Window for all requests: no more clutter





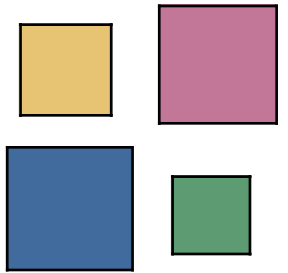
## JGR – Features

- Syntax Highlighting
  - Works at any place where you enter code
    - Console
    - Editor
- Brace Matching
  - Indicates both correct and incorrect matching
  - Works in console and editor
- Drag & Drop
  - For those who like it, drag & drop works between
    - Console
    - Editor
    - Object Browser (uni directional)



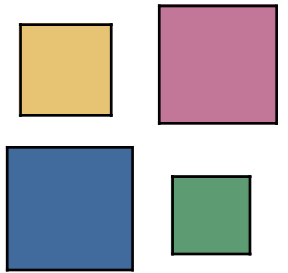
## JGR – Auto Completion

- Auto completion works wherever you need it by pressing the `<TAB>` key.
  - **Code**  
All commands (including loaded libraries) are expanded
  - **Objects**  
All your objects are expanded as well
  - **Files**  
Completion within quotes will search your files, including “~”
- Final flavor of completion strategy yet to be defined ... will be customizable



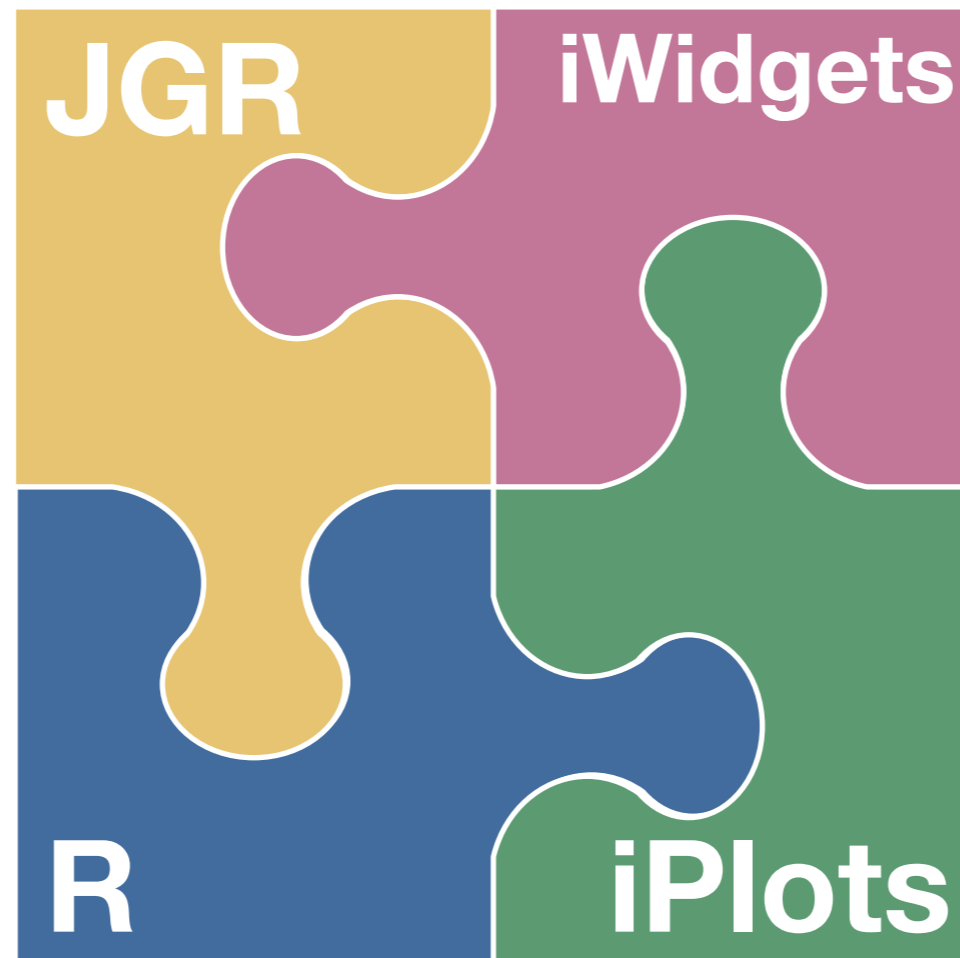
## JGR – Quick Hints

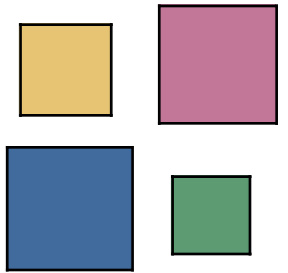
- Quick Hints offer additional information on objects and functions to avoid help and summary lookups.
  - **Functions**  
When the cursor is placed in a function name in console or editor, the function prototype is shown as given in the help file definition.
  - **Model formulae**  
For models in the model view of the object browser, the model formula is listed as specified in the call to the model function.
  - **Object Summaries**  
For all other objects the summary function is called to give a brief overview of what a variable or data.frame contains.



## JGR – The Bigger Picture

- **JGR** is just one building block of the RoSuDa interactive software around **R**





## Summary

- JGR is the first unified approach to interact with R
- Many interactive features try to make the workflow with R as smooth as possible: “Get the interface out of the way!”
- Currently supported platforms are Windows and MacOSX – other platforms (LINUX) still suffer stability of R communication.
- Current version is Developer Preview 2 (DP2)
- Most parts of JGR still need the “finishing touch”!
- We need your input to make it even better!

Question: Do I need to switch?