



不要998! 不要998!  
只要你的专心和投入!

还能赚走2个学分!

# 40分钟! R语言入门到精通!

黄颖诗

中国基础教育质量监测协同创新中心

- Where: RStudio界面
- What: 基本数据类型 & 数据读写
- How: 程序结构 & 函数编写
  
- Visualization
- Some tips :-)
- Resources

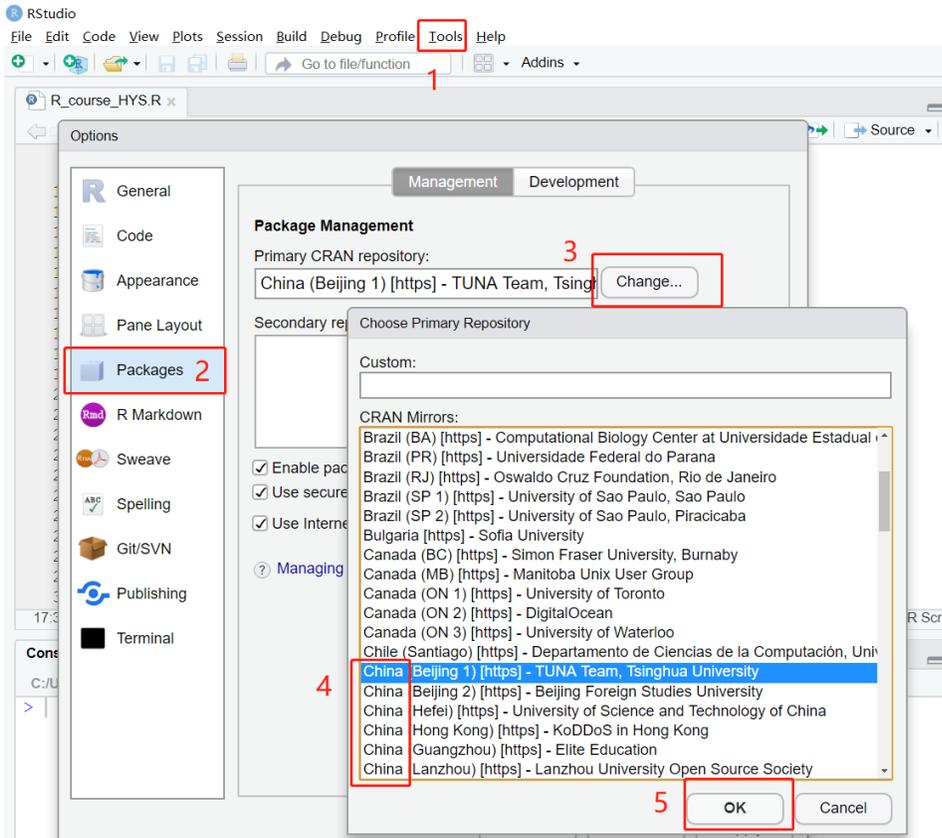
# 软件安装

---

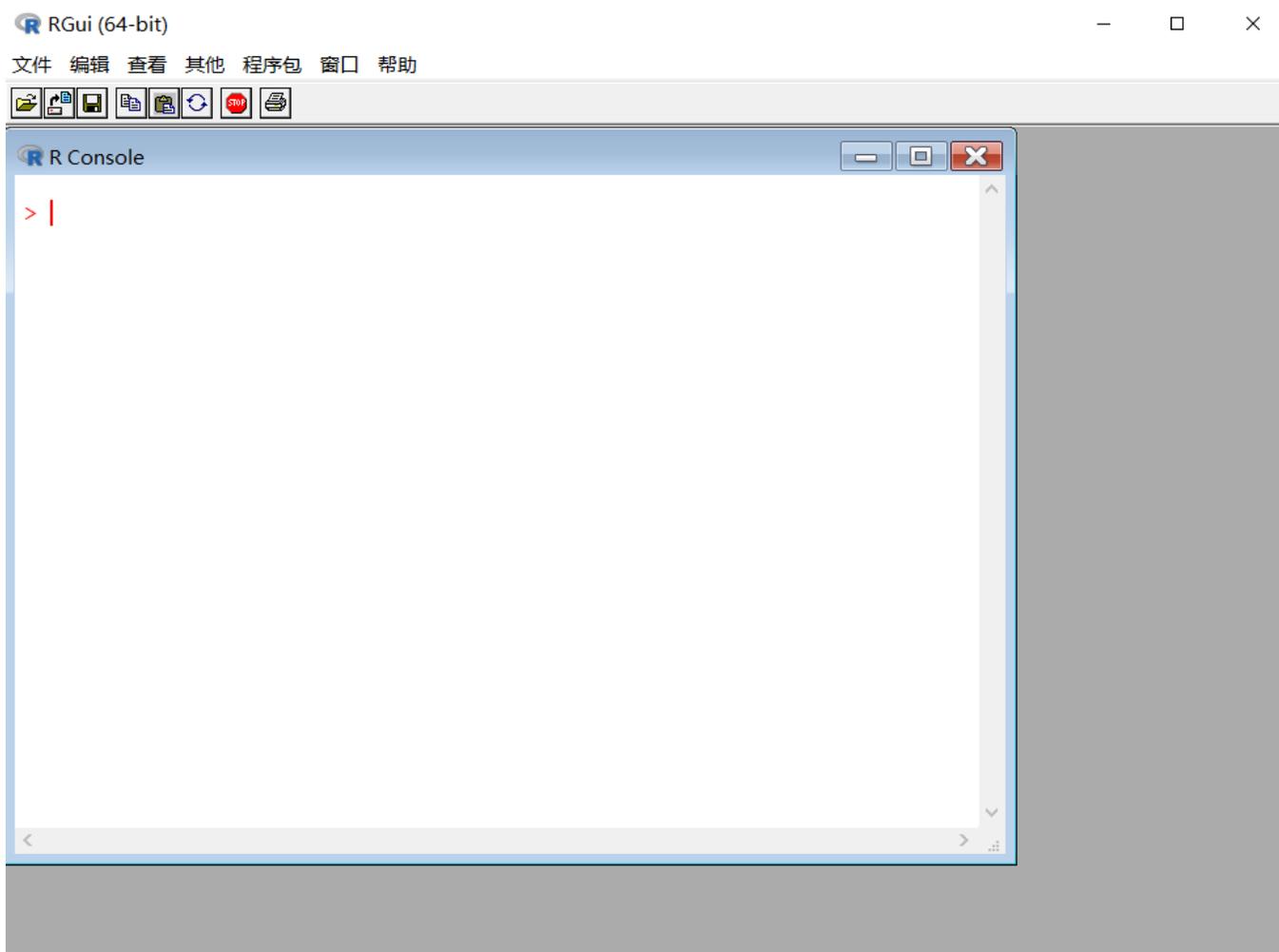
- 在正式开始之前，需要先在电脑上安装3个软件：
  - R: <https://www.r-project.org/>
  - RStudio: <https://www.rstudio.com/>
  - Rtools: <https://cran.r-project.org/bin/windows/Rtools/>
- 
- R 软件是我们需要统计计算软件；
  - RStudio 是专门为R软件量身定做的一款IDE，可以提高工作效率；
  - Rtools 提供R软件工作时可能需要的其他环境；
  - 总而言之，请在学习R语言之前正确安装这3个软件，以避免出现各种各样的问题，如RStudio打不开、某些软件包无法正常使用等，推荐安装时全部采用默认路径，并且最好电脑用户名为英文。

# 软件安装

- 如果你已经正确安装了以上软件，一个建议是先打开RStudio，将下载的镜像修改为国内镜像；
- 选择一个国内的镜像可能会让软件包的下载速度更快一些。



# RGui : 朴实无华



# RStudio: 让编程变得更舒适

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The image shows the RStudio interface with four red annotations:

- Let everything run according to the script:** Located in the source editor, pointing to the code lines.
- Actors in the script can be seen here:** Located in the Environment pane, pointing to the 'new\_variable' entry.
- This is the stage, you can see the performance effect:** Located in the Console pane, pointing to the output of the code.

The screenshot includes the following details:

- Source Editor:** Contains R code: 

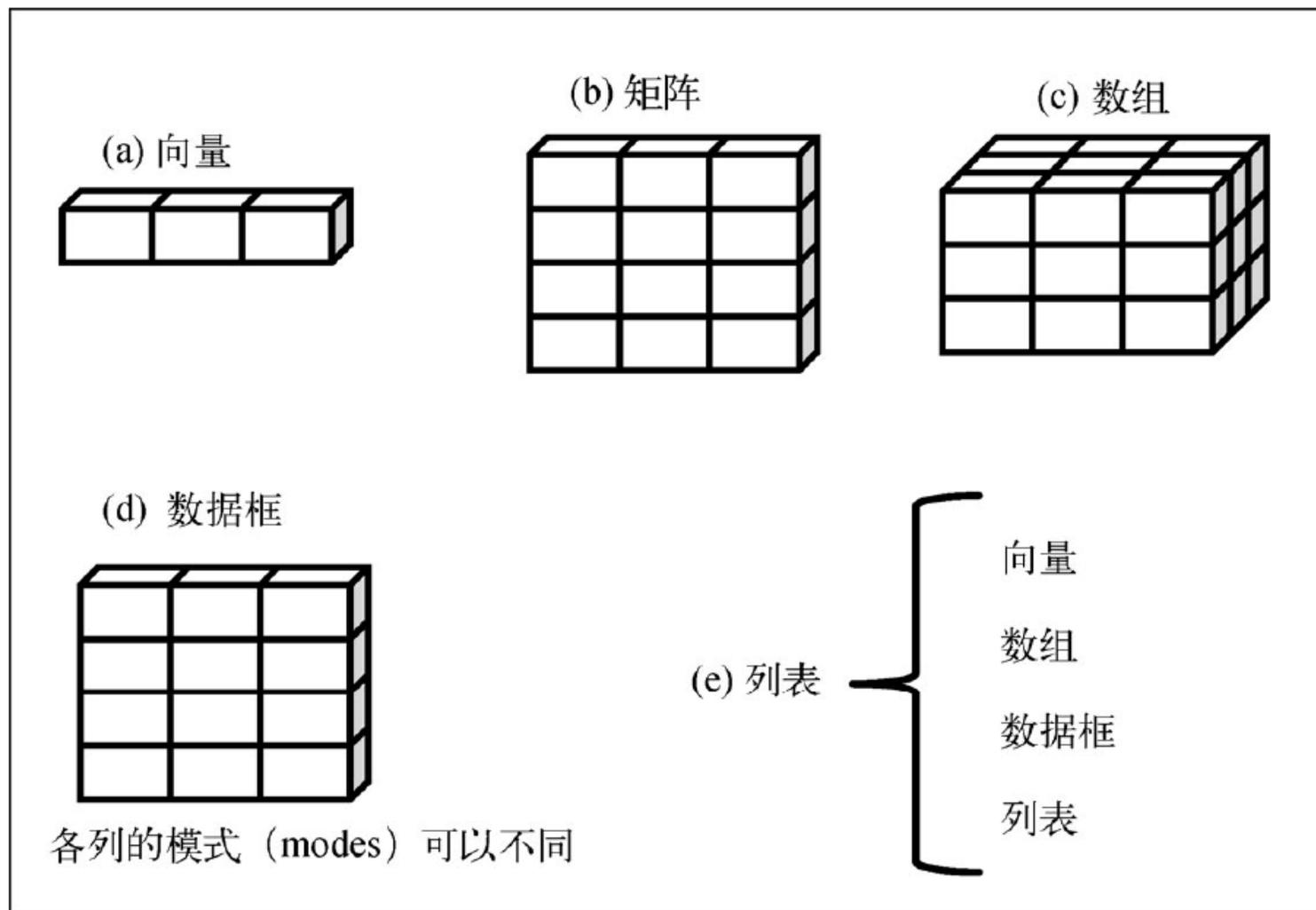
```
1 # you are encouraged to write your code here!  
2 print("Hello world!")
```
- Environment Pane:** Shows the 'Global Environment' with a search bar and a table of values: 

new_variable	1
new_variable	1
- Console:** Shows the execution output: 

```
> print("Hello world!")  
[1] "Hello world!"  
> new_variable <- 1  
> |
```
- Files Pane:** Shows the file explorer for the path 'C:\Users\HYS', listing folders like .AS, .conda, .config, .dotnet, and idlerc.

类型	例子	语法
逻辑型 (Logical)	TRUE, FALSE	Var <- FALSE
数值型 (Numeric)	1, 299, 2.33, 0.134	Var <- 2.33
整数型 (Integer)	2L, 34L, 0L	Var <- 666L
文字型 (Character)	"Hello"	Var <- "Hello"
因子型 (Factor)	A B C Levels: A B C A B C Levels: A < B < C	Var <- factor(c("A", "B", "C")) Var <- factor(c("A", "B", "C"), ordered = T)
复数型 (Complex)	3 + 2i	Var <- 3+2i
原生型 (Raw)	"Hello" is stored as: 48 65 6c 6c 6f	Var <- charToRaw("Hello")

数据类型	例子	用途	零点/单位	运算	对应R变量
称名 (nominal)	名字、性别	表明身份、分类	无零点、无单位	$= \neq$	逻辑、文字、无序的因子
顺序 (ordinal)	排名	比较	无零点、无单位	$= \neq > <$	有序的因子
等距 (interval)	摄氏度	差值	无零点、有单位	$= \neq > < + -$	数值、整数
比率 (ratio)	长度	程度数量	有零点、有单位	$= \neq > < + -$ $\times \div$	数值、整数



## 1. Know your working dictionary:

- `get.wd()` # 返回当前工作目录
- `set.wd()` # 指定一个工作目录

## 2. Read data:

- `read.csv()`, `read.table()` # 读取表格形式的数据
- `readLines()` # 读取文本数据
- ...

## 3. Write data:

- `write.csv()`, `write.table()`
- `writeLines()`
- ...

- if-else
- ifelse

- function

- plot
- ggplot

- for
- while

- 注释让世界更美妙：多行变为注释 `Ctrl + shift + C`
- 命名：电脑可读 & 人类可读
- 程序分块，清晰愉快
- 写进度条，让漫长的运行多一份安心
- ...

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- ...

by Jenny Bryan

**NO**

- myabstract.docx
- Joe's Filenames Use Spaces and Punctuation.xlsx
- figure 1.png
- fig 2.png
- JW7d^(2sl@deletethisandyourcareerisoverWx2\*.txt

**YES**

- 2014-06-08\_abstract-for-sla.docx
- joes-filenames-are-getting-better.xlsx
- fig01\_scatterplot-talk-length-vs-interest.png
- fig02\_histogram-talk-attendance.png
- 1986-01-28\_raw-data-from-challenger-o-rings.txt

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- ...

```
rm(list = ls())
time.start <- Sys.time()

# set working directory
# define functions
# set variables
# main body
# save results
# plot data
```

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- ...

```
[1] "Finish: 99.0% for 1000 examinees."  
[1] "Finish: 99.1% for 1000 examinees."  
[1] "Finish: 99.2% for 1000 examinees."  
[1] "Finish: 99.3% for 1000 examinees."  
[1] "Finish: 99.4% for 1000 examinees."  
[1] "Finish: 99.5% for 1000 examinees."  
[1] "Finish: 99.6% for 1000 examinees."  
[1] "Finish: 99.7% for 1000 examinees."  
[1] "Finish: 99.8% for 1000 examinees."  
[1] "Finish: 99.9% for 1000 examinees."  
[1] "Finish: 100.0% for 1000 examinees."
```

# 有了这些，你就有了全世界

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- 强大的R document: <https://www.rdocumentation.org/>
- 99%的问题都能在这儿找到答案: <https://stackoverflow.com/>
- 好看的图和代码: <https://www.r-graph-gallery.com/>
- 遵循一定的风格，让程序更可读: <http://adv-r.had.co.nz/Style.html>
  
- Google is your friend!



# Thanks for listening!

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