

第一章：配置 R 语言环境

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配置 R 语言环境

环境配置

主要分三步：

- 安装 R
- 安装 Rstudio
- 安装必要的宏包

第一步安装 R

- 下载并安装 R，官方网
站 <http://cran.r-project.org>

The screenshot shows the official R Project website. At the top left is the R logo. The main title "The R Project for Statistical Computing" is centered above a "Getting Started" section. Below it is a "News" section with a red box highlighting the release of R version 3.6.1. At the bottom, there's a "News via Twitter" section with a tweet from The R Foundation Retweeted.

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The R Project for Statistical Computing

Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and Mac OS. To [download R](#), please choose your preferred CRAN mirror.

If you have questions about R like how to download and install the software, or what the license terms are, please read our answers to frequently asked questions before you send an email.

News

- [R version 3.6.1 \(Action of the Toes\)](#) has been released on 2019-07-05.
- useR! 2020 will take place in St. Louis, Missouri, USA.
- [R version 3.5.3 \(Great Truth\)](#) has been released on 2019-03-11.
- The R Foundation Conference Committee has released a [call for proposals](#) to host useR! 2020 in North America.
- You can now support the R Foundation with a renewable subscription as a [supporting member](#).
- The R Foundation has been awarded the Personality/Organization of the year 2018 award by the professional association of German market and social researchers.

News via Twitter

The R Foundation Retweeted

useR! 2020

第二步安装 RStudio

- 下载并安装 RStudio，官方网站
<https://www.rstudio.com/download>
- 选择 RStudio Desktop

Installers	Size	Date	MD5
RStudio 1.2.5001 - Ubuntu 18/Debian 10 (64-bit)	105.43 MB	2019-09-19	f108e4d5c1b6c19690378b3ca0990249
RStudio 1.2.5001 - Debian 9 (64-bit)	105.70 MB	2019-09-19	23dca12a5e0a0849522f05b4a8600ce8
RStudio 1.2.5001 - Fedora 28/Red Hat 8 (64-bit)	120.90 MB	2019-09-19	45eab0baf8d0504d183f09c8d40ae704
RStudio 1.2.5001 - macOS 10.12+ (64-bit)	126.86 MB	2019-09-19	a4d8ee737818158b272450eaad4bcd4f
RStudio 1.2.5001 - SLES/OpenSUSE 12 (64-bit)	99.04 MB	2019-09-19	ca94a9bb7e7f5474eedd233ddeef14d6
RStudio 1.2.5001 - OpenSUSE 15 (64-bit)	107.12 MB	2019-09-19	2a40768fdc5c5f97cd1d40628bf8aaad
RStudio 1.2.5001 - Fedora 19/Red Hat 7 (64-bit)	120.27 MB	2019-09-19	14bc52d6f78bc4ee22abff2298be919f
RStudio 1.2.5001 - Ubuntu 14/Debian 8 (64-bit)	96.93 MB	2019-09-19	c19b0ece90130bed7248c1bf6001c647
RStudio 1.2.5001 - Windows 10/8/7 (64-bit)	149.83 MB	2019-09-19	c54d8779f363ec9636c7831e577521bd
RStudio 1.2.5001 - Ubuntu 16 (64-bit)	104.88 MB	2019-09-19	4ff58a08c305207729feb65eb145a5a2

注意事项

这里有个小小的提示：

- 电脑用户名**不要有中文和空格**
- 尽量安装在非系统盘，比如，可以选择安装在 D 盘
- 安装路径**不要有中文和空格**。比如，这样就比较好
 - D:/R
 - D:/Rstudio

可观看视

频<https://www.bilibili.com/video/BV1hA411e7k3>后安装

RStudio 很友好

The screenshot shows the RStudio interface with the following components:

- Code Editor (Top Left):** Displays an R script named "diamondPricing.R". A red box highlights the text "1- Code Editor".
- R Console (Bottom Left):** Displays the output of running the R script. A red box highlights the text "2- R Console".
- Workspace and History (Top Right):** Shows the current workspace with the diamonds dataset and its summary statistics. A red box highlights the text "3- Workspace and History".
- Plots and files (Bottom Right):** Displays a scatter plot titled "Diamond Pricing" showing Price vs. Carat, with points colored by clarity. A red box highlights the text "4 - Plots and files".

Detailed description of the R Console output:

```
library(ggplot2)
view(diamonds)
summary(diamonds)
summary(diamonds$price)
avesize <- round(mean(diamonds$carat), 4)
clarity <- levels(diamonds$clarity)
p <- qplot(carat, price,
           data=diamonds, color=clarity,
           xlab="Carat", ylab="Price",
           main="Diamond Pricing")
format.plot(plot=p, size=23)
```

RStudio 很友好

- 左上角是 Editor 窗口，负责编写代码
- 左下角是 Console 窗口，可以键入命令
- 右上角是 Environment 和 History 窗口，保存当前存储的数据和历史命令记录等
- 右下角是 Plot 和 Help 窗口，用于显示绘制图片和帮助文档

R 与 RStudio 是什么关系呢

R

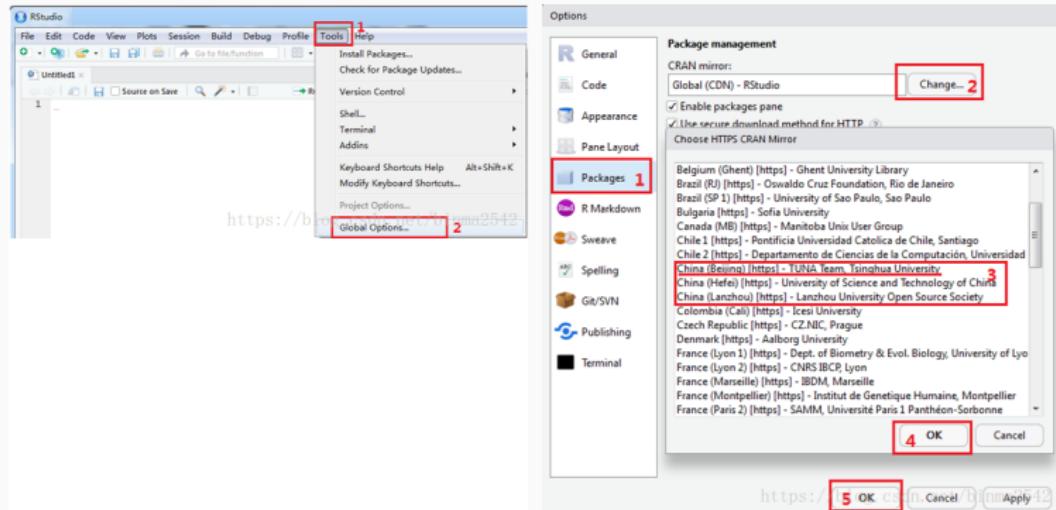


RStudio



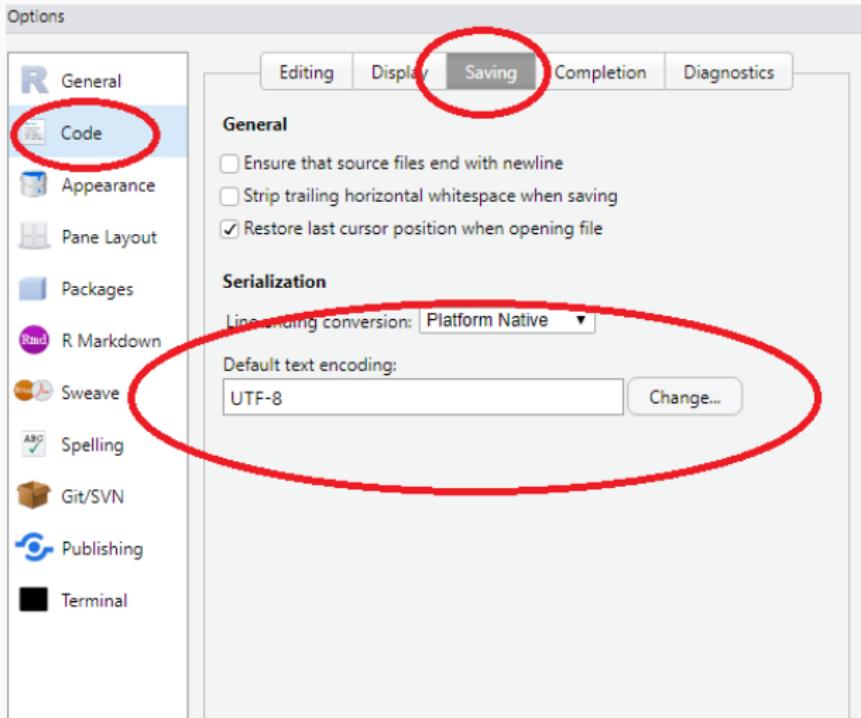
必要的配置 (可选)

- 宏包安装设置成国内镜像 Tools > Global options



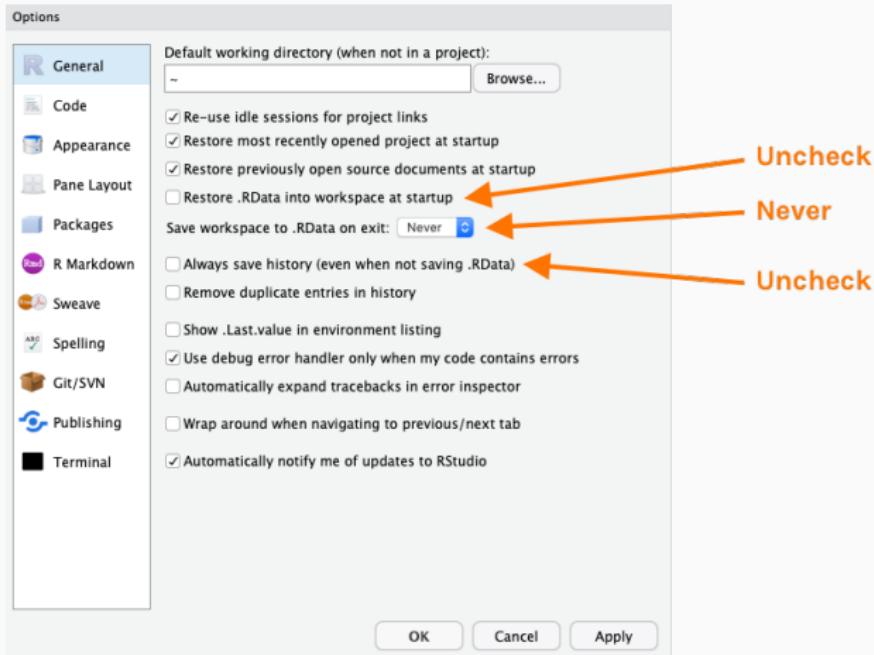
必要的配置 (可选)

- 如果打开代码是乱码，试试修设置 Tools > Global options

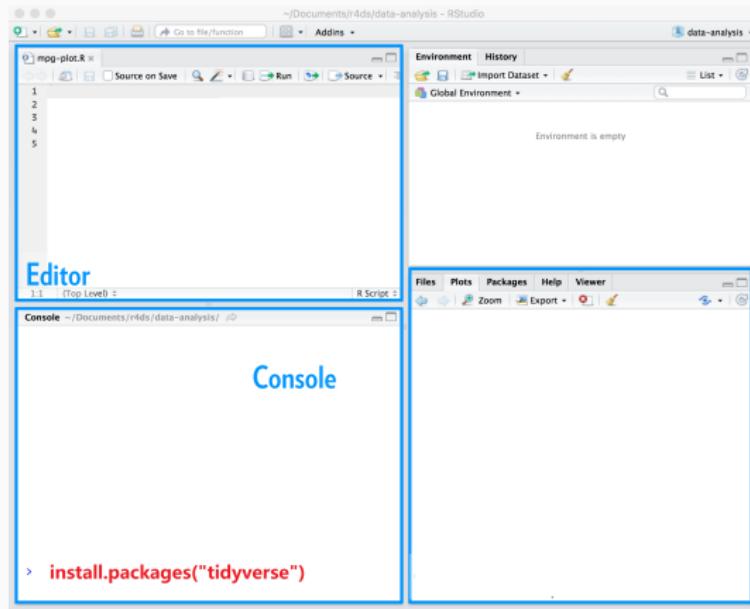


必要的配置

- 如果每次打开 Rstudio 非常慢，可以将这几个选项取消掉 Tools > Global options



第三步安装宏包



- 命令行安装
 - `install.packages("tidyverse")`

使用宏包

Installing vs. Loading

INSTALL ONCE:

```
install.packages("light")
```



USE MANY TIMES:

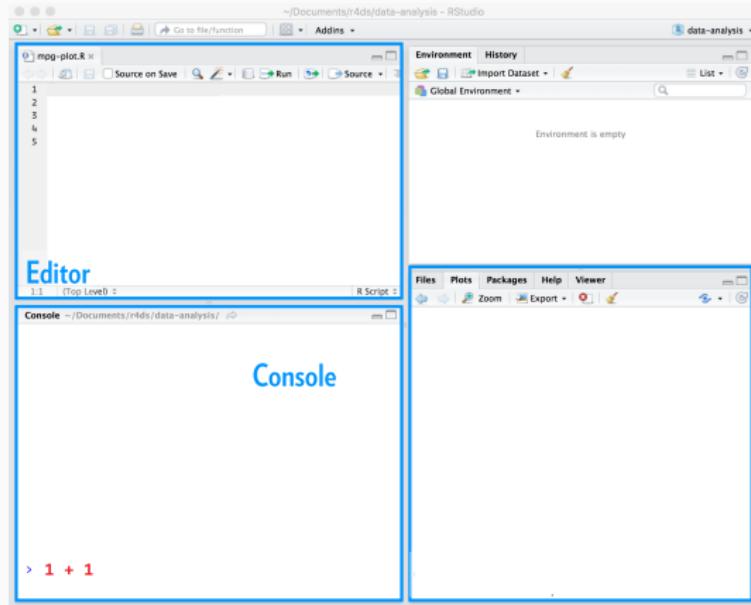
```
library("light")
```



wiki How to Change a Light Bulb

测试

测试

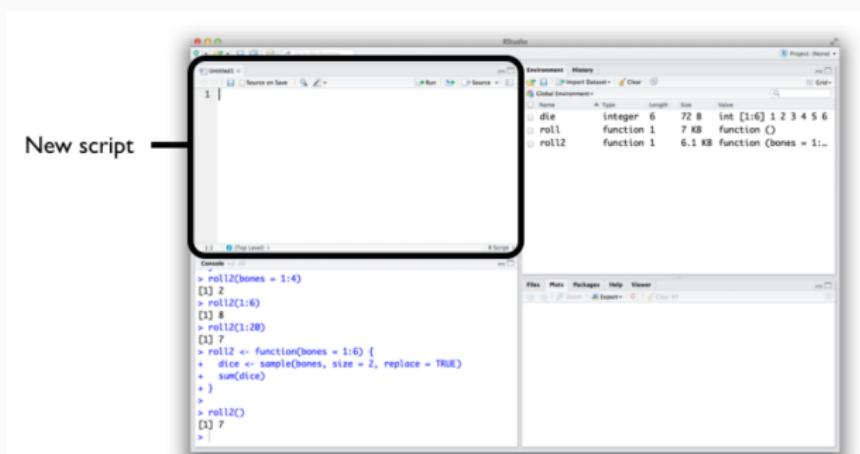


在 Console 内键入 $1 + 1$ 并按回车后，将显示如下结果

```
1 + 1  
#> [1] 2
```

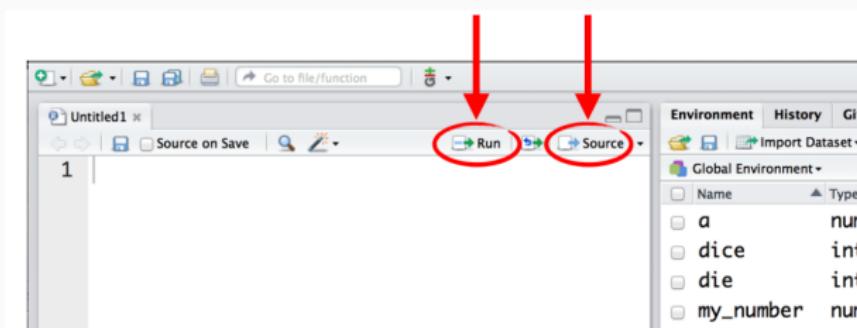
脚本

通过 Rstudio 菜单栏依次点击 File > New File > R Script 来创建一个新的脚本。脚本文件通常以 .R 作为文件的后缀名。



脚本

如何运行脚本呢？方法有很多



- 按住 Ctrl 键，然后按回车键 Enter，可以运行光标所在行的代码
- 点击 Run，运行光标所在行的代码
- 点击 Source，从头到尾运行当前脚本全部代码
- 鼠标选中多行代码，然后点击 Run 或者 Ctrl + Enter

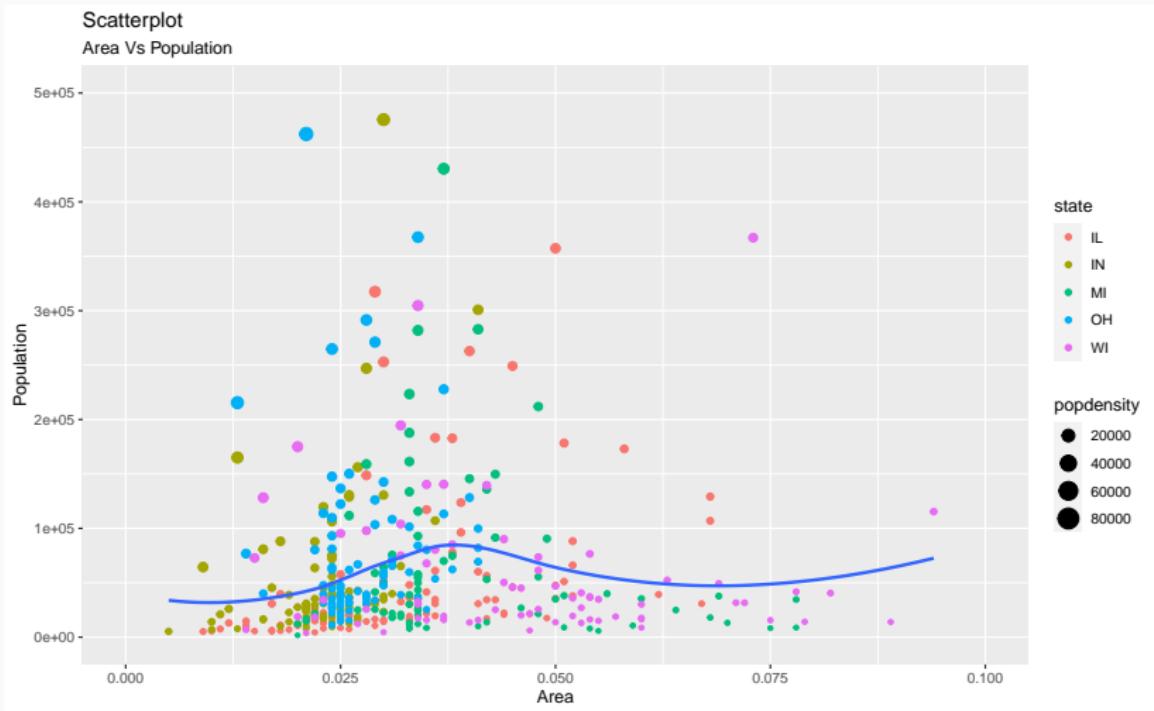
测试

复制以下代码到脚本编辑区

```
library(ggplot2)

ggplot(midwest, aes(x = area, y = poptotal)) +
  geom_point(aes(color = state, size = popdensity)) +
  geom_smooth(method = "loess", se = F) +
  xlim(c(0, 0.1)) +
  ylim(c(0, 500000)) +
  labs(
    title = "Scatterplot",
    subtitle = "Area Vs Population",
    x = "Area",
    y = "Population"
)
```

测试



可能的问题

可能的问题

- 我的电脑是苹果系统，怎么安装呢？
- 我的 Rstudio 需要哪些设置？
- 为什么 Rstudio 打开是空白呢？
- 安装宏包太慢，怎么解决？
- 安装宏包，遇到报错信息”unable to access index for repository...“？

如何使用 Rstudio Cloud

可能

学习 R 语言，首先需要配置运行环境，但可能遇到

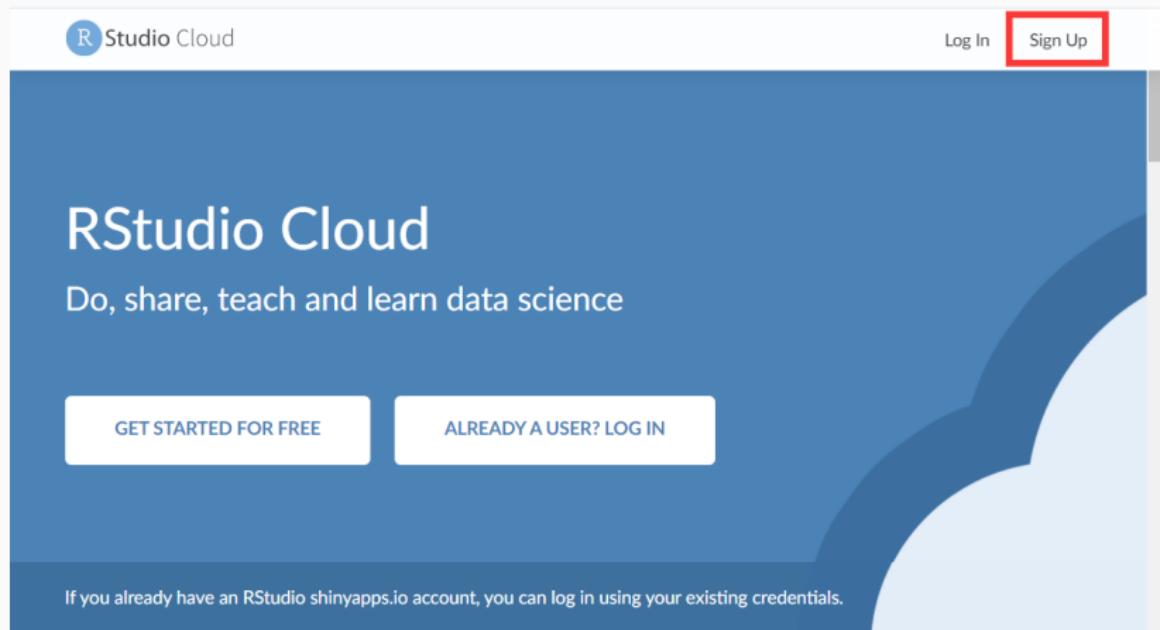
- 安装 R 和 Rstudio 路径不规范，
- 也有可能电脑的版本老旧，
- 还有就是有些同学的电脑开机用户名是中文，导致在 Rmarkdown 里运行结果不能正常显示。

这些不顺畅的因素都会带来挫败感，从而影响入门学习的心情。

本文介绍**免安装的方法！**

云平台

浏览器打开 <https://rstudio.cloud/>



注册

注册一个账号

The screenshot shows the RStudio Cloud sign-up interface. At the top, there is a navigation bar with the RStudio Cloud logo, a "Plans" dropdown, and "Log In" and "Sign Up" buttons. Below the navigation bar, there are four tabs: "Free" (selected), "Premium", "Instructor", and "Organization". The main content area is titled "Cloud Free" and contains text about the free plan: "If you make limited, occasional use of RStudio Cloud, or have your usage covered by your school/organization or an instructor, our free plan is all you need." It also mentions the "Plus" plan: "If you need additional time, consider our Plus plan. For \$5 / month, get 75 project hours per month - and you can use additional hours as needed for 10¢ per hour." A "Plus" toggle switch is shown. At the bottom right, a "Sign Up" button is highlighted with a red border.

R Studio Cloud Plans ▾

Log In Sign Up

Free Premium Instructor Organization

Cloud Free

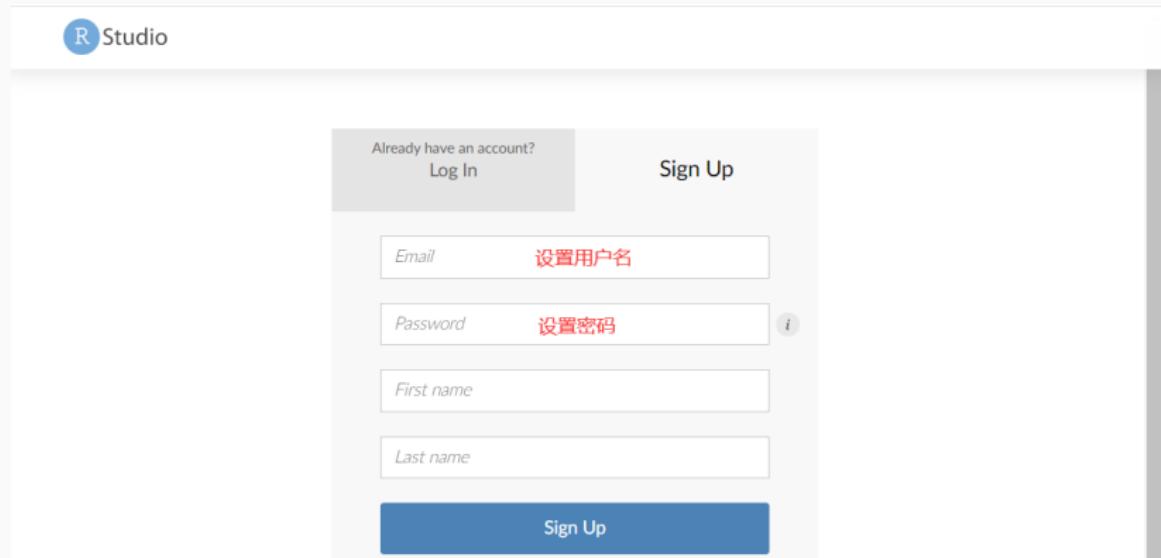
If you make limited, occasional use of RStudio Cloud, or have your usage covered by your school/organization or an instructor, our free plan is all you need.

If you need additional time, consider our **Plus** plan. For \$5 / month, get 75 project hours per month - and you can use additional hours as needed for 10¢ per hour.

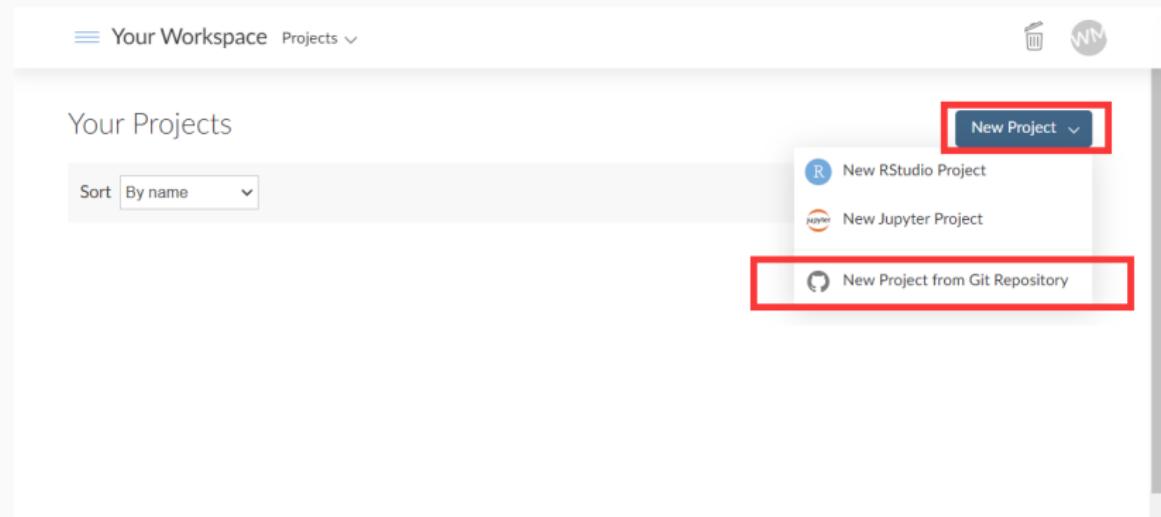
Plus

Sign Up

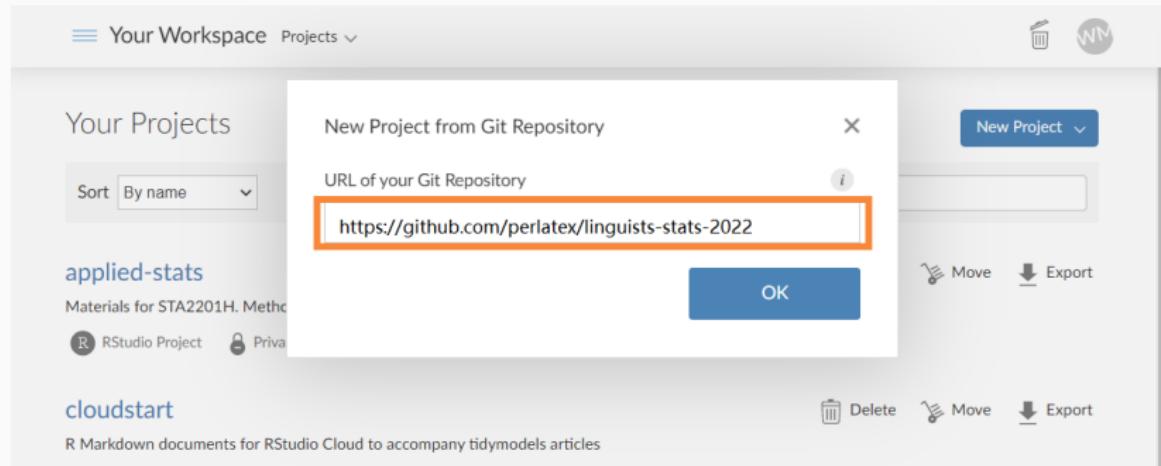
填入信息



登录后创建 Project



导入课件



复制 <https://github.com/perlatex/linguists-stats-2022>

开始界面

The screenshot shows the RStudio IDE interface. At the top, there's a header bar with tabs for 'Your Workspace / data-analysis-with-r'. Below it is a menu bar with File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. A toolbar follows with various icons like file operations and a search bar. The main area has tabs for Console, Terminal, and Jobs. The Console tab is active, displaying the R startup message:

```
R version 4.1.2 (2021-11-01) -- "Bird Hippie"  
Copyright (C) 2021 The R Foundation for Statistical Computing  
Platform: x86_64-pc-linux-gnu (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.
```

To the right of the console, there's an Environment pane showing 'Environment is empty'. Below it is a Files pane listing a 'project' folder containing several files and subfolders, all highlighted with an orange border. The files listed are: .., .gitignore (40 B, Jan 9, 2022), .Rhistory (0 B, Jan 9, 2022), 00_whyR, 01_install, 02_basicR, 03_Rmarkdown, 04_operators, and 05_functions.

课件都在这里

安装宏包

Your Workspace / data-analysis-with-r

File Edit Code View Plots Session Build Debug Profile Tools Help

RAM Addins R 4.1.2

Console Terminal x Jobs x

R 4.1.2 - /cloud/project/

```
R version 4.1.2 (2021-11-01) -- "Bird Hippie"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
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R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
```

> install.packages("tidyverse")

键入后，记得回车喔

Environment History Connections Git Tutorial

Import Dataset 124 MiB List Global Environment

Environment is empty

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

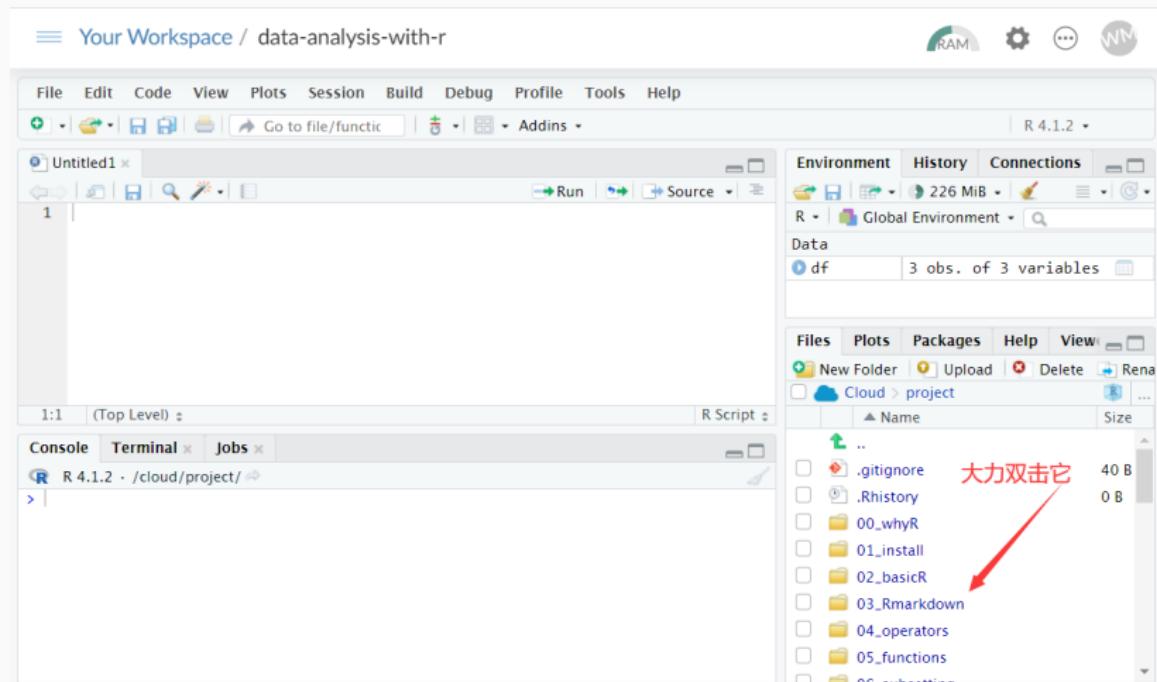
Name	Size	Modified
..		
.gitignore	40 B	Jan 9, 2022 1
.Rhistory	0 B	Jan 9, 2022 1
00_whyR		
01_install		
02_tidyverse		

安装宏包

The screenshot shows the RStudio interface with the following details:

- Console Tab:** Displays the command-line output of package installations. The output shows the installation of several packages from the tidyverse family, including dbplyr, dtplyr, googlesheets4, readr, readxl, tidyr, broom, haven, modelr, tidyverse, and functions. Each package is listed with its status as "DONE".
- Message:** A blue message box at the bottom right of the console area says "恭喜你，安装成功" (Congratulations, installation successful).
- Output:** Below the message, it says "The downloaded source packages are in '/tmp/RtmpprVrN6f/downloaded_packages'".
- Environment Tab:** Shows the global environment, which is currently empty.
- Files Tab:** Shows a list of files in the current project directory. The files listed are .gitignore, .Rhistory, 00_whyR, 01_install, 02_basicR, 03_Rmarkdown, 04_operators, and 05_functions.

打开学习课件



以上步骤成功后，每次都是从这里开始喔！

愉快的玩耍

Your Workspace / data-analysis-with-r

File Edit Code View Plots Session Build Debug Profile Tools Help

my_doc.Rmd x Go to file/function Addins R 4.1.2

45
46
47 # 插入表格 2. 写代码
48
49 ``{r}
50 df <- data.frame(
51 name = c("a", "b", "c"),
52 sex = c("male", "female", "male"),
53 score = c(98, 89, 87)
54)
55 df
56 ``

3. 点我 

name	sex	score
a	male	98
b	female	89
c	male	87

3 rows

57 51:9 Chunk 4 R Markdown

Environment History Connections

R Global Environment 226 MiB

Data df 3 obs. of 3 variables

Files Plots Packages Help View

New Folder Upload Delete Rena

Cloud project 03_Rmarkdown

Name Size

..

data

images

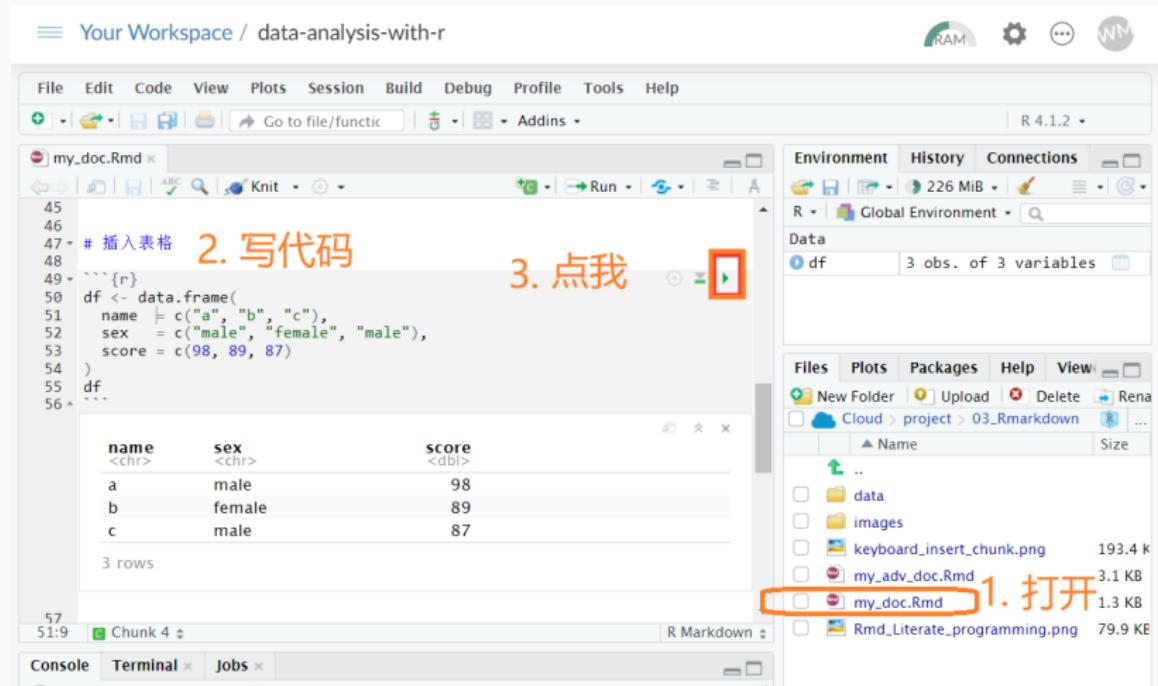
keyboard_insert_chunk.png 193.4 K

my_adv_doc.Rmd 3.1 KB

1. 打开 my_doc.Rmd 1.3 KB

Rmd_Literate_programming.png 79.9 KB

Console Terminal Jobs



每段代码都成功后，整体可以生成一份文档

my_doc.Rmd

```
1 ---  
2 title: "Rmarkdown 文档"  
3 subtitle: "这是我的副标题"  
4 author: "王小二"  
5 date: `r Sys.Date()`  
6 output:  
7   html_document:  
8     theme: flatly  
9     highlight: pygments  
10    code_download: true  
11    #code_folding: hide  
12    toc: true  
13    toc_float: true  
14    number_sections: true  
15    df_print: paged  
16 ---  
17  
18
```

温柔地点我

Console Terminal Jobs

R 4.1.2 · /cloud/project/

RAM Settings Help

Environment History Connections

Data

Files Plots Packages Help View

New Folder Upload Delete Rename

Cloud > project > 03_Rmarkdown

Name	Size
..	
data	
images	
keyboard_insert_chunk.png	193.4 K
my_adv_doc.Rmd	3.1 KB
my_doc.Rmd	1.3 KB
Rmd_Literate_programming.png	79.9 KB

她的样子

The screenshot shows a web browser displaying an R Markdown document. The URL in the address bar is `/cloud/project/03_Rmarkdown/my_doc.html`. The page title is "Rmarkdown文档". On the left, there's a sidebar with a dark header containing the number 1 and a list of five items: 1运行代码, 2插入表格, 3生成图片, 4插入图片, and 5参考资料. The main content area has a large title "Rmarkdown文档" and a subtitle "这是我的副标题". Below that is the author information "王小二" and the date "2022-01-09". A paragraph follows: "大家好，我是你们的新朋友 Rmarkdown，有时候简写为Rmd。你看到.Rmd，不要惊慌。现在我就来说说，我有什么不一样的功能吧..." The first section, "1 运行代码", contains several code blocks. The first block shows the output of `## [1] 1 2 3 4 5 6 7 8 9 10`. The second block shows the assignment `x <- 5` followed by the value `x`. The third block shows the output of `## [1] 5`.

1运行代码

这是我的副标题

王小二

2022-01-09

大家好，我是你们的新朋友 Rmarkdown，有时候简写为Rmd。你看到.Rmd，不要惊慌。现在我就来说说，我有什么不一样的功能吧...

1 运行代码

```
1:10
```

```
## [1] 1 2 3 4 5 6 7 8 9 10
```

```
x <- 5
```

```
x
```

```
## [1] 5
```

2 插入表格

她在代码的身边

The screenshot shows the RStudio interface with the following details:

- File Menu:** File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help.
- Toolbar:** Includes icons for file operations like Open, Save, and Print, along with Go to file/function, Run, and Addins.
- Version:** R 4.1.2.
- Left Panel:** Shows the code editor with an R Markdown file named "my_doc.Rmd". The code is as follows:

```
1 ---  
2 title: "Rmarkdown文档"  
3 subtitle: "这是我的副标题"  
4 author: "王小二"  
5 date: `r Sys.Date()`  
6 output:  
7   html_document:  
8     theme: flatly  
9     highlight: pygments  
10    code_download: true  
11    #code_folding: hide  
12    toc: true  
13    toc_float: true  
14    number_sections: true  
15    df_print: paged  
16 ---  
17  
18
```

- Environment Tab:** Shows the Global Environment with a data frame "df" containing 3 observations and 3 variables.
- Files Tab:** Shows the project structure with files like "my_adv_doc.Rmd", "my_doc.Rmd", "Rmd_Literate_programming.png", and "my_doc.html". The "my_doc.html" file is highlighted with a red box and has a red arrow pointing to it from the text "我是刚刚被生成的" (I was just generated).
- Console Tab:** Shows the R environment as R 4.1.2 · /cloud/project/.
- Message:** A red box highlights the message "我是刚刚被生成的" (I was just generated) at the bottom right of the interface.

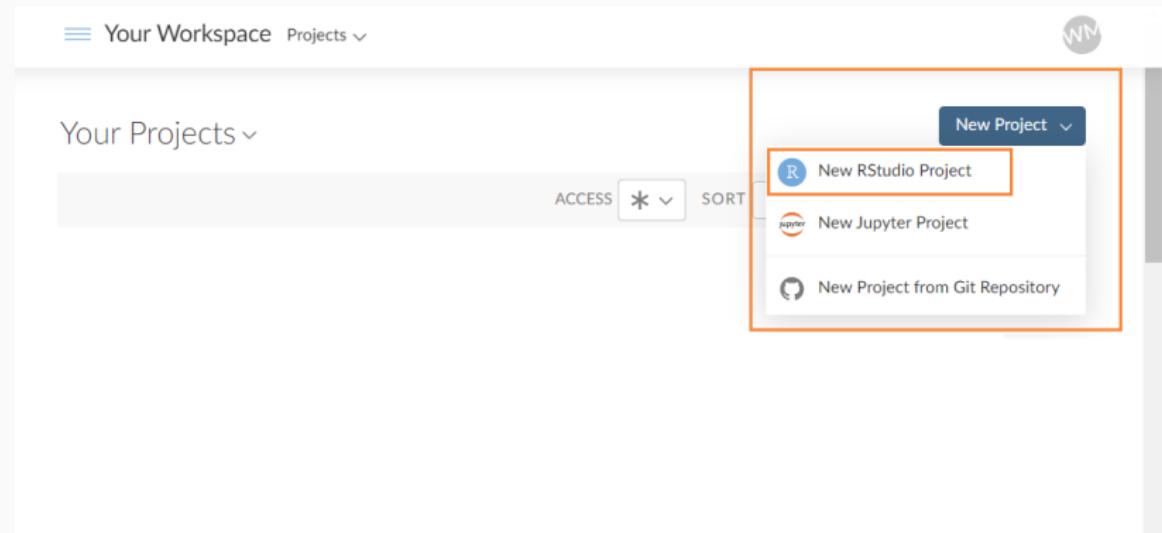
导出到本地

The screenshot shows the RStudio interface with the following elements:

- File Menu:** File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Help.
- Toolbar:** Go to file/function, Addins.
- Environment Tab:** RAM, Settings, Help, Global Environment (df).
- Code Editor (Chunk 4):** R Markdown code for generating an HTML file.
- Console Tab:** R 4.1.2 - /cloud/project/
- File Explorer:** Shows files in the project: .., data, images, keyboard_inser, my_adv_doc.Rmd, my_doc.Rmd, Rmd_Literate_p.
- More Options Menu (highlighted with red box 2):** Contains options like Copy..., Copy To..., Move..., Copy Folder Path to Clipboard, Export..., Set As Working Directory, Go To Working Directory, Synchronize Working Directory, Open New Terminal Here, and Show Hidden Files.
- Export Option (highlighted with red box 3):** The "Export..." option is highlighted in the "More" menu.
- Numbered Labels:** Red numbers 1, 2, and 3 are placed on the interface to identify specific components.

创建自己的工作空间

创建自己的项目



项目名称

Your Workspace / Untitled Project + Click to name your project 修改项目名

File Edit Code View Plots Session Build Debug Profile Tools Help

RAM R 4.1.2

Console Terminal Jobs

R 4.1.2 - /cloud/project/

```
R version 4.1.2 (2021-11-01) -- "Bird Hippie"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R
```

Environment History Connections Tutorial

Import 123 MiB List C

Global Environment

Environment is empty

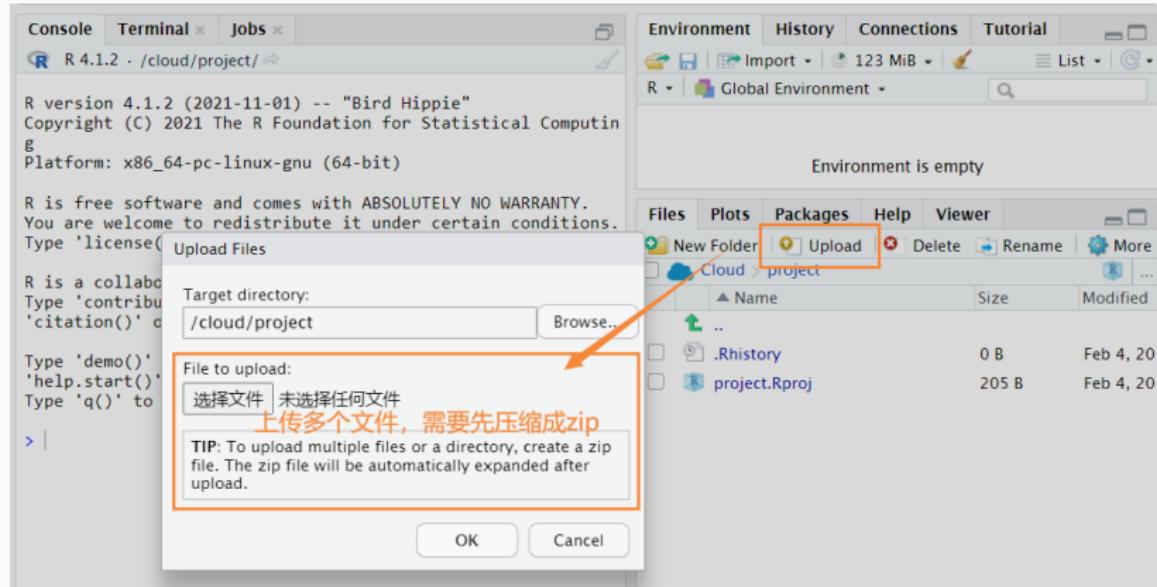
Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Cloud > project

Name	Size	Modified
..		
.Rhistory	0 B	Feb 4, 20
project.Rproj	205 B	Feb 4, 20

本地文件上传到云端



上传文件夹

Your Workspace / myhomework

File Edit Code View Plots Session Build Debug Profile Tools Help

RAM ... WM

Console Terminal Jobs

R 4.1.2 · /cloud/project/

```
R version 4.1.2 (2021-11-01) -- "Bird Hippie"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

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'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
```

Environment History Connections Tutorial

Import 122 MiB List

Global Environment

Environment is empty

Files Plots Packages Help Viewer

New Folder Upload Delete Rename More

Name	Size	Modified
..		
.Rhistory	0 B	Feb 4, 20
project.Rproj	205 B	Feb 4, 20
hw01		

愉快地玩耍

The screenshot shows the RStudio interface. In the top-left, the code.Rmd file contains R code with Chinese annotations:

```
27 | kid_score | 小孩考试分数
28 | mom_hs   | 母亲是否完成高中
29 | mom_iq   | 母亲IQ值
30 | mom_age  | 母亲年龄
31 |
32 |
33 ````{r}
34 df <- readRDS("data/kidiq.RDS")
35 df
36 ````
```

An orange arrow points from the text "愉快地玩耍" to the code area. Below the code, a data preview window shows the following table:

kid_score	mom_hs	mom_iq	mom_age
65	1	121.11753	27
98	1	89.36188	25
85	1	115.44316	27
83	1	99.44964	25
115	1	92.74571	27
98	0	107.90184	18

In the top-right, the Environment pane shows the global environment with a dataset df containing 434 observations and 4 variables.

Annotations in the interface:

- "愉快地玩耍" (Play happily) is highlighted in orange with an arrow pointing to the code area.
- "双击打开" (Double-click to open) is highlighted in orange with an arrow pointing to the code.Rmd file in the Files pane.

Welcome to R, RStudio, and
the tidyverse!