

第一章：配置 R 语言环境

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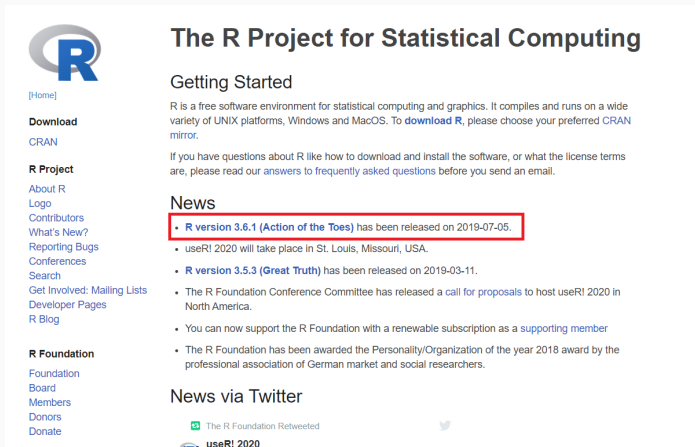
配置 R 语言环境

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. On the left is a navigation menu with links like [Home], Download, CRAN, R Project, About R, Logo, Contributors, What's New?, Reporting Bugs, Conferences, Search, Get Involved: Mailing Lists, Developer Pages, R Blog, R Foundation, Foundation, Board, Members, Donors, and Donate. The main content area has the title 'The R Project for Statistical Computing' and a 'Getting Started' section. Below this is a 'News' section with a red box highlighting the entry for 'R version 3.6.1 (Action of the Toes)' released on 2019-07-05. Other news items include 'useR! 2020' and 'R version 3.5.3 (Great Truth)'. At the bottom, there is a 'News via Twitter' section showing a tweet from 'The R Foundation' retweeted by 'useR! 2020'.



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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 MacOS. 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 for Supported Platforms

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	a4d8ee737818158b272450eaa4bd4cf
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

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，这样就好
 - D:/R
 - D:/Rstudio

RStudio 很友好

The screenshot shows the RStudio desktop environment. The interface is divided into several panes. The top-left pane is the Code Editor, showing R code for loading data and creating a plot. The top-right pane is the Workspace and History pane, showing the loaded data object 'diamonds'. The bottom-left pane is the R Console, showing the output of the R code. The bottom-right pane is the Plots pane, showing a scatter plot titled 'Diamond Pricing'.

1- Code Editor

```
1 library(ggplot2)
2
3 view(diamonds)
4 summary(diamonds)
5
6 summary(diamonds$price)
7 aveSize <- round(mean(diamonds$carat), 4)
8 cl <- levels(diamonds$clarity)
9
10 p <- ggplot(diamonds, aes(carat, price, color=clarity))
11
12
13 theme_minimal()
14 main="Diamond Pricing")
```

3- Workspace and History

Workspace History

Data
diamonds 53940 obs. of 10 variables

Values
aveSize 0.7979

2- R Console

```
> summary(diamonds)
      x      y      z
Min.   0.000 Min.   0.000 Min.   0.000
1st Qu. 4.710 1st Qu. 4.720 1st Qu. 2.910
Median  5.700 Median  5.710 Median  3.530
Mean    3.539
3rd Qu. 4.040
Max.    1.800
> summary(diamonds$price)
      Min.      1st Qu.      Median      Mean      3rd Qu.      Max.
326.0000   950.0000  2401.0000  3933.0000  5324.0000 18820.0000
> aveSize <- round(mean(diamonds$carat), 4)
> clarity <- levels(diamonds$clarity)
> p <- ggplot(diamonds, color=clarity,
+ data=diamonds,
+ xlab="carat", ylab="Price",
+ main="Diamond Pricing")
> format.plot(plot=p, size=23)
```

4 - Plots and files

Diamond Pricing

Price

Carat

R 与 RStudio 是什么关系呢

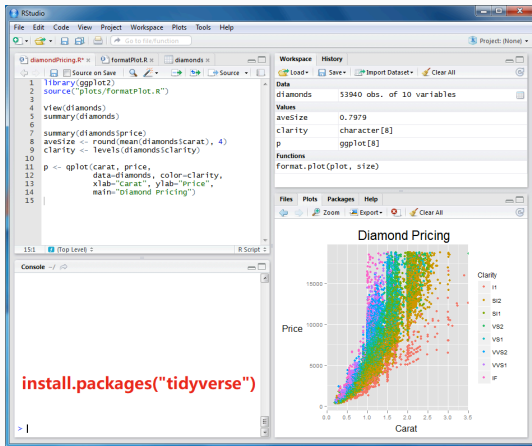
R



RStudio



第三步安装宏包



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

如果想生成 pdf 文档，可能需要 \LaTeX ，然而，这个软件会比较大，动辄 4 个 G. 因此，我推荐安装轻量级的 `tinytex`. 安装方法如下，

- `install.packages("tinytex")`
- `tinytex::install_tinytex(dir = "D:\\Tinytex", force = T)`

中途会有两次警告，按“确定”就可以了

获取帮助很便捷

The screenshot shows the RStudio interface. The editor pane on the left contains a markdown document with the following content:

```
1: ---
2: title: "Untitled"
3: author: "wmj"
4: date: "2019/10/31"
5: output: html_document
6: ---
7:
8: ```{r setup, include=FALSE}
9: knitr::opts_chunk$set(echo = TRUE)
10: ```
11:
12: ## R Markdown
13:
14: This is an R Markdown document. Markdown is a simple formatting
15: syntax for authoring HTML, PDF, and MS word documents. For more
16: details on using R Markdown see http://rmarkdown.rstudio.com.
```

The console pane at the bottom left shows the command `?glm` being entered. The environment pane on the right shows "Environment is empty". The R Documentation pane on the right displays the documentation for the `glm` function, titled "Fitting Generalized Linear Models".

glm (stats)
R Documentation

Fitting Generalized Linear Models

Description

`glm` is used to fit generalized linear models, specified by giving a symbolic description of the linear predictor and a description of the error distribution.

Usage

```
glm(formula, family = gaussian, data, weights, subset,
na.action, start = NULL, etastart, mustart, offset,
control = list(), model = TRUE, method = "glm.fit",
x = FALSE, y = TRUE, singular.ok = TRUE, contrasts = NULL, ...)
```

```
glm.fit(x, y, weights = rep(1, nobs),
start = NULL, etastart = NULL, mustart = NULL,
offset = rep(0, nobs), family = gaussian(),
control = list(), intercept = TRUE, singular.ok = TRUE)
```

```
## S3 method for class "glm"
weights(object, type = c("prior", "working"), ...)
```

Arguments

formula	an object of class <code>"formula"</code> (or one that can be coerced to that class): a symbolic description of the model to be fitted. The details of model specification are given under <code>Details</code> .
family	a description of the error distribution and link function to be used in the model. For <code>glm</code> this can be a character string naming a family function, a family function or the result of a call to a family function. For <code>glm.fit</code> only the first option is supported. (See family for details of family functions.)
data	an optional data frame, list or environment (or object coercible by <code>as.data.frame</code> to a data frame) containing the variables in the model. If not found in <code>data</code> , the variables are taken from <code>environment(formula)</code> , typically the environment from which <code>glm</code> is called.
weights	an optional vector of 'prior weights' to be used in the fitting process. Should be <code>NULL</code> or a numeric vector.
subset	an optional vector specifying a subset of observations to be used in the fitting process.

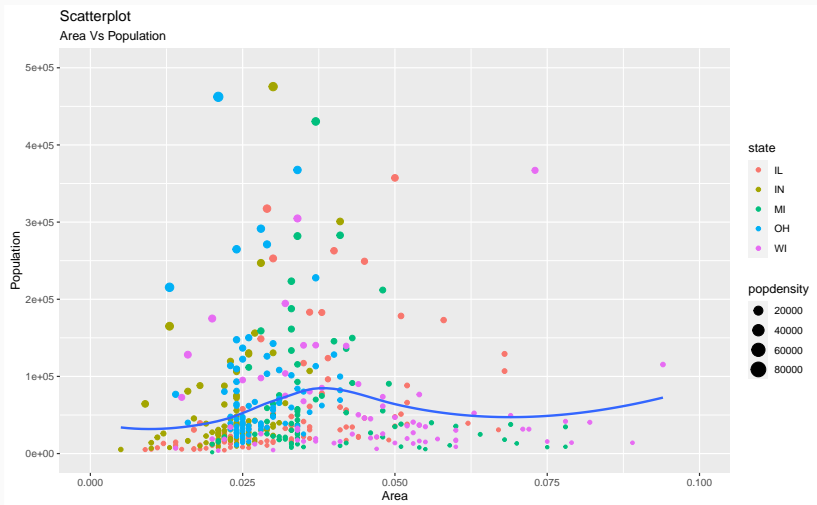
测试

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...” ？