

R 语言编程概述：1. 软件安装和配置

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学习目标

- 搭建 R 编程环境
- 熟悉 R 语言基础操作
- 编写 R 函数
- 使用 Rmarkdown 文档
- 编写 R 程序包
- 使用 git 和 github 进行版本控制

操作系统 Windows 10

- R (<https://www.r-project.org/>) # Windows
- Rtools (<https://cran.r-project.org/bin/windows/Rtools/>) #
- MikTeX (<https://miktex.org/download>)
- Rstudio (<https://www.rstudio.com/>)
- git (<https://git-scm.com/>)

要安装的文本编辑器

- Rstudio (<https://www.rstudio.com/>)
- Notepad++ (<https://notepad-plus-plus.org/download/>)
- atom (<https://atom.io/>)

要安装的 R 程序包

```
install.packages("devtools", dependencies = TRUE)
install.packages("rticles")
install.packages("ape")
install.packages("vegan")
install.packages("picante")
install.packages("EcoSimR")
install.packages("HK80")
install.packages("lubridate")
```

将 Rcmd.exe 添加到启动路径

- R 默认安装在 (请注意 R 的版本) :

C:\Program Files\R\R-3.5.0\bin\i386

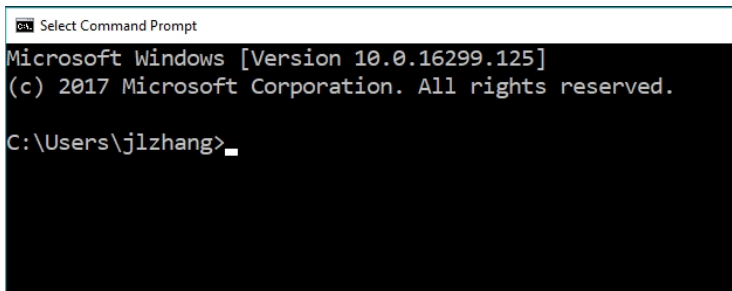


图 1: 打开 Windows CMD

添加启动路径 1

我的电脑，右键，属性

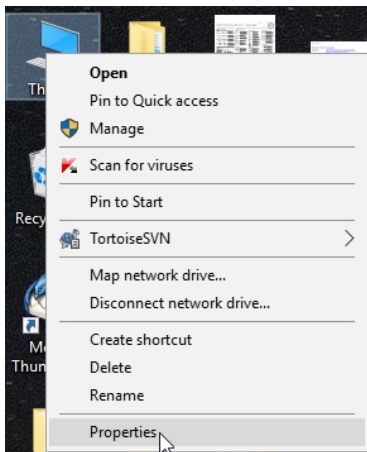


图 2：桌面 > 我的电脑 > 属性

添加启动路径 2

导航栏，我的电脑，右键，属性

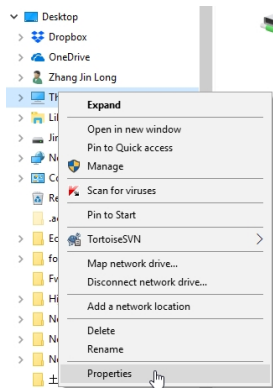


图 3: 导航栏 > 我的电脑 > 属性

Windows10 系统页面

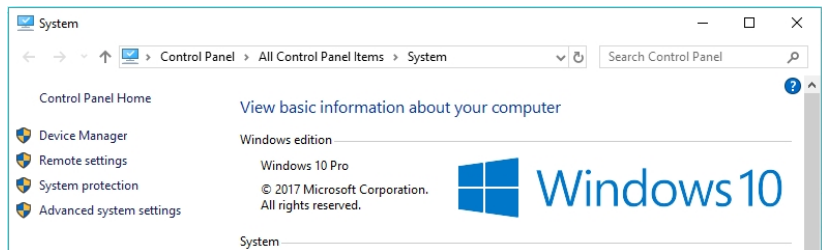


图 4: Window10 系统信息

添加启动路径 4

系统属性窗口，点击环境变量按钮

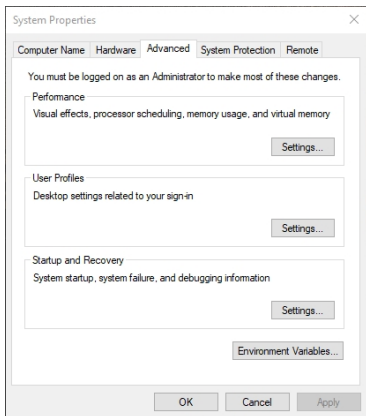


图 5：高级 > 环境变量

添加启动路径 5

在下面一栏，系统变量中，找到 PATH 变量，点击“编辑 Edit”

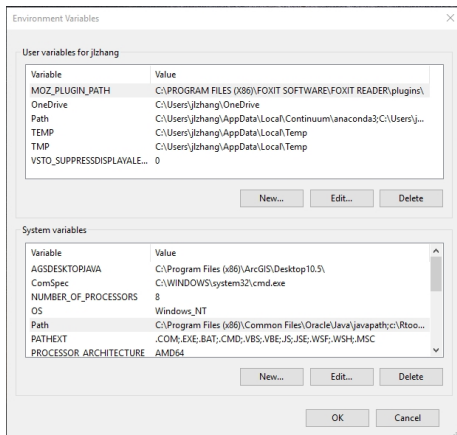


图 6: 系统变量 > Path > 编辑

添加启动路径 6

编辑环境变量窗口，点击新建 New

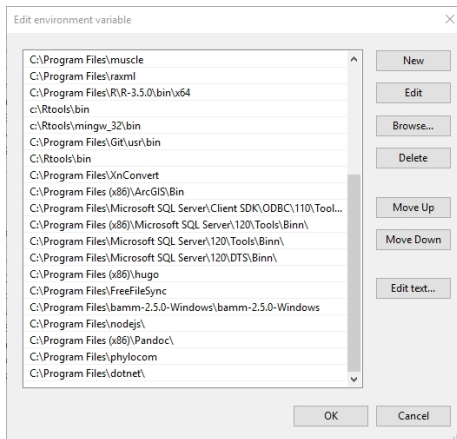
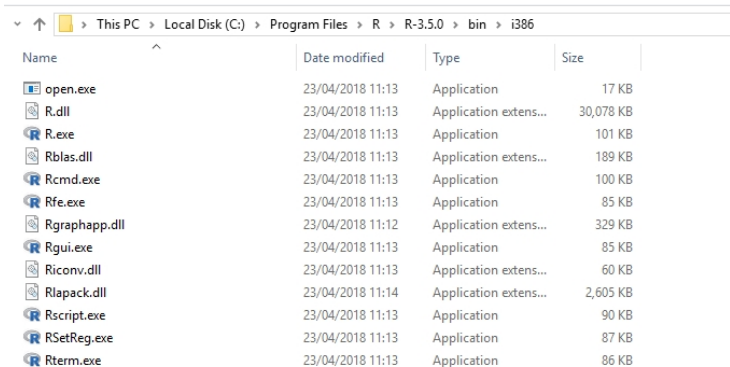


图 7：编辑环境变量 > 新建

添加启动路径 7

找到 R 安装路径 1



This PC > Local Disk (C:) > Program Files > R > R-3.5.0 > bin > i386				
Name	Date modified	Type	Size	
open.exe	23/04/2018 11:13	Application	17 KB	
R.dll	23/04/2018 11:13	Application extens...	30,078 KB	
R.exe	23/04/2018 11:13	Application	101 KB	
Rblas.dll	23/04/2018 11:13	Application extens...	189 KB	
Rcmd.exe	23/04/2018 11:13	Application	100 KB	
Rfe.exe	23/04/2018 11:13	Application	85 KB	
Rgraphapp.dll	23/04/2018 11:12	Application extens...	329 KB	
Rgui.exe	23/04/2018 11:13	Application	85 KB	
Riconv.dll	23/04/2018 11:13	Application extens...	60 KB	
Rlapack.dll	23/04/2018 11:14	Application extens...	2,605 KB	
Rscript.exe	23/04/2018 11:13	Application	90 KB	
RSetReg.exe	23/04/2018 11:13	Application	87 KB	
Rterm.exe	23/04/2018 11:13	Application	86 KB	

图 8: R 软件默认安装路径

添加启动路径 8

拷贝 R 安装路径 2

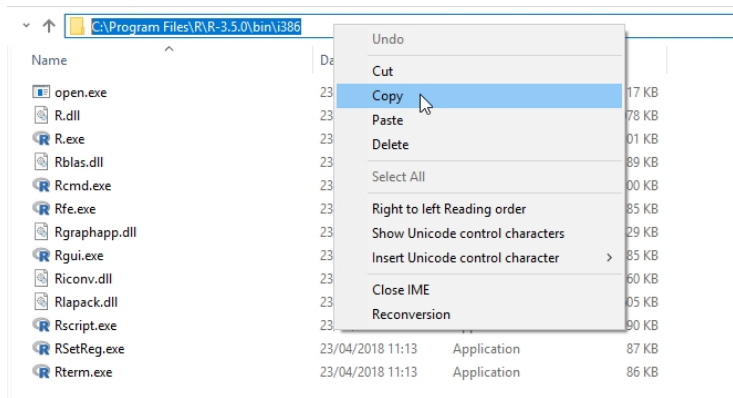


图 9: 拷贝 R 安装路径

添加启动路径之后 9

添加到 Path 之后，点击确定，关闭所有窗口

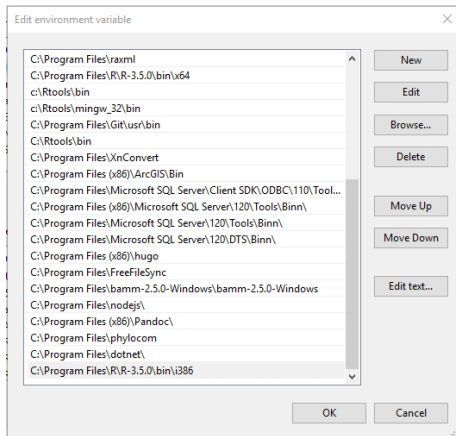


图 10: 添加 R 安装路径到启动路径效果图

MikTeX 安装

选择 32bit 版本，下载和安装。因为 64bit 软件与 64 位系统并不是完全兼容。

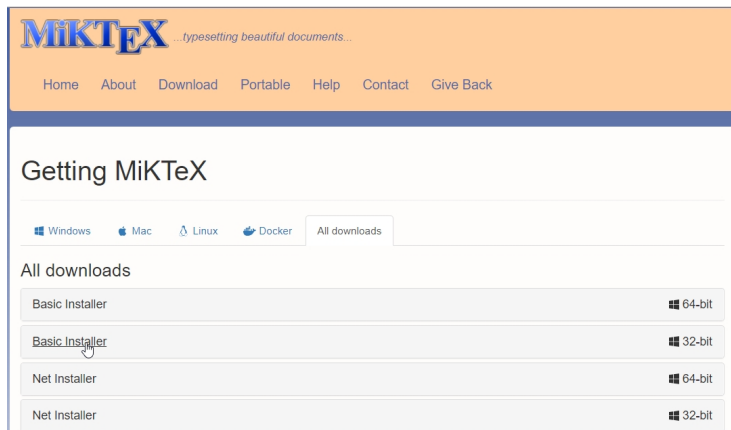
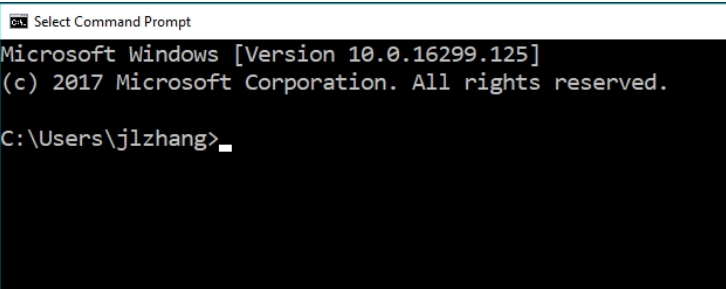


图 11: 下载 MikTeX 32 位版本

检查软件安装：调用 cmd

Windows, 在搜索 > 输入 cmd> 提示 Command Prompt

A screenshot of a Windows Command Prompt window. The title bar at the top reads "Select Command Prompt". The window has a black background with white text. The text inside the window reads: "Microsoft Windows [Version 10.0.16299.125]" followed by "(c) 2017 Microsoft Corporation. All rights reserved." on the next line. The third line shows the current directory as "C:\Users\jllzhang>" with a white cursor at the end.

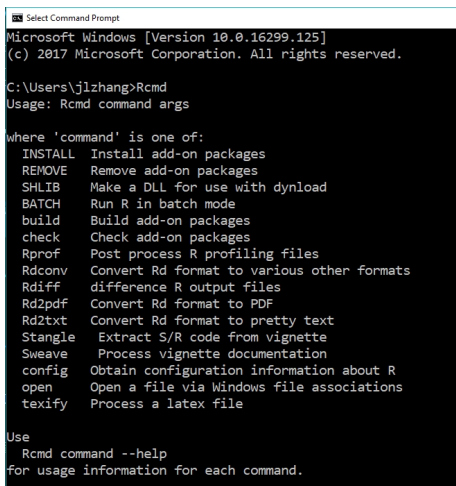
```
Microsoft Windows [Version 10.0.16299.125]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\jllzhang>
```

图 12: 在 command prompt 中输入 Rcmd

检查软件安装: Rcmd

添加 R 的启动路径, 在 command prompt 中输入 Rcmd 检查



```
Select Command Prompt
Microsoft Windows [Version 10.0.16299.125]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\jlzhang>Rcmd
Usage: Rcmd command args

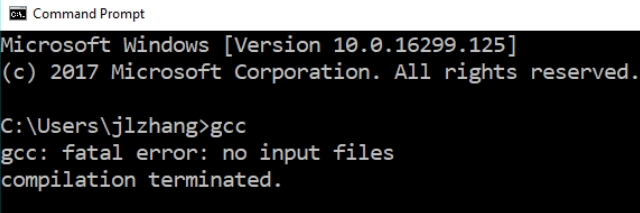
where 'command' is one of:
  INSTALL  Install add-on packages
  REMOVE   Remove add-on packages
  SHLIB     Make a DLL for use with dynload
  BATCH    Run R in batch mode
  build     Build add-on packages
  check     Check add-on packages
  Rprof     Post process R profiling files
  Rdconv    Convert Rd format to various other formats
  Rdiff     difference R output files
  Rd2pdf    Convert Rd format to PDF
  Rd2txt    Convert Rd format to pretty text
  Stangle   Extract S/R code from vignette
  Sweave    Process vignette documentation
  config    Obtain configuration information about R
  open      Open a file via Windows file associations
  texify    Process a latex file

Use
  Rcmd command --help
for usage information for each command.
```

图 13: 在 command prompt 中输入 Rcmd

检查软件安装: Rtools

若 Rtools 已经安装好, 则应在 command prompt 输入 gcc 检查



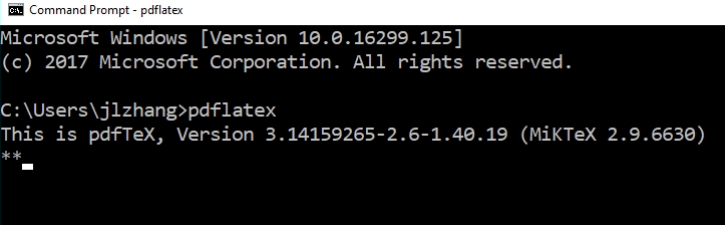
```
Command Prompt
Microsoft Windows [Version 10.0.16299.125]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\jllzhang>gcc
gcc: fatal error: no input files
compilation terminated.
```

图 14: 在 command prompt 中输入 gcc

检查软件安装: MikTeX

若 MikTeX 已经安装好, 则应在 command prompt 输入 pdflatex 检查



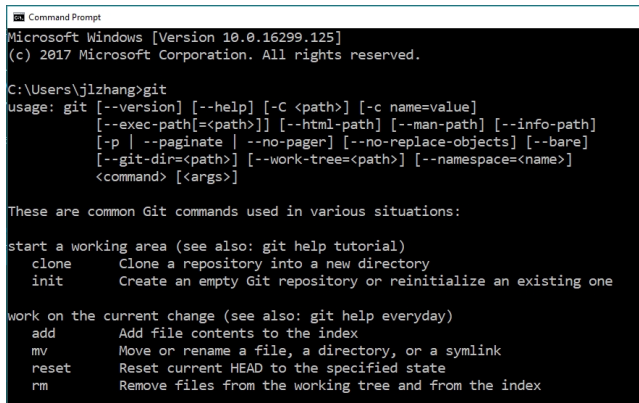
```
Command Prompt - pdflatex
Microsoft Windows [Version 10.0.16299.125]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\j1zhang>pdflatex
This is pdfTeX, Version 3.14159265-2.6-1.40.19 (MiKTeX 2.9.6630)
**
_
```

图 15: 在 command prompt 中输入 pdflatex

检查软件安装: git

若 git 已经安装好, 则应在 command prompt 输入 git 检查



```
Microsoft Windows [Version 10.0.16299.125]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\j1zhang>git
usage: git [--version] [--help] [-C <path>] [-c name=value]
         [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
         [-p | --paginate | --no-pager] [--no-replace-objects] [--bare]
         [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
         <command> [<args>]

These are common Git commands used in various situations:

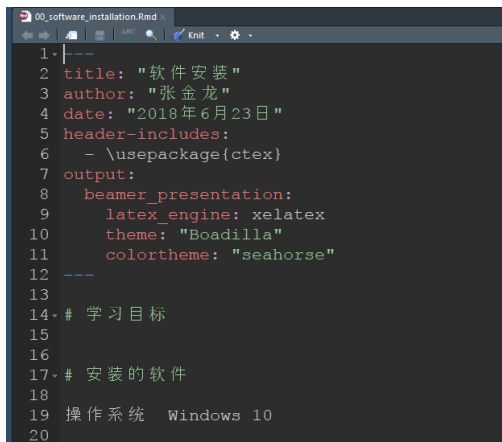

start a working area (see also: git help tutorial)
    clone      Clone a repository into a new directory
    init       Create an empty Git repository or reinitialize an existing one

work on the current change (see also: git help everyday)
    add        Add file contents to the index
    mv         Move or rename a file, a directory, or a symlink
    reset      Reset current HEAD to the specified state
    rm         Remove files from the working tree and from the index
```

图 16: 在 command prompt 中输入 git

MikTeX 下载编译 beamer 用的字体

请先用 Studio 打开./beamer/00_software_installation.Rmd 文件, 点击 Knit, 编译 Rmarkdown 文档, 以便让 MikTeX 下载相应字体。



```
1 |---
2 |title: "软件安装"
3 |author: "张金龙"
4 |date: "2018年6月23日"
5 |header-includes:
6 |  - \usepackage{ctex}
7 |output:
8 |  beamer_presentation:
9 |    latex_engine: xelatex
10 |    theme: "Boadilla"
11 |    colortheme: "seahorse"
12 |---
13 |
14 |# 学习目标
15 |
16 |
17 |# 安装的软件
18 |
19 |操作系统    Windows 10
20 |
```

图 17: 编译 Rmarkdown 文档