Review Session 2, POE 2018

Yuanyuan Cheng

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Download and Install R

R is a free software environment for statistical computing and graphics. Please choose your preferred version when you **download R**.
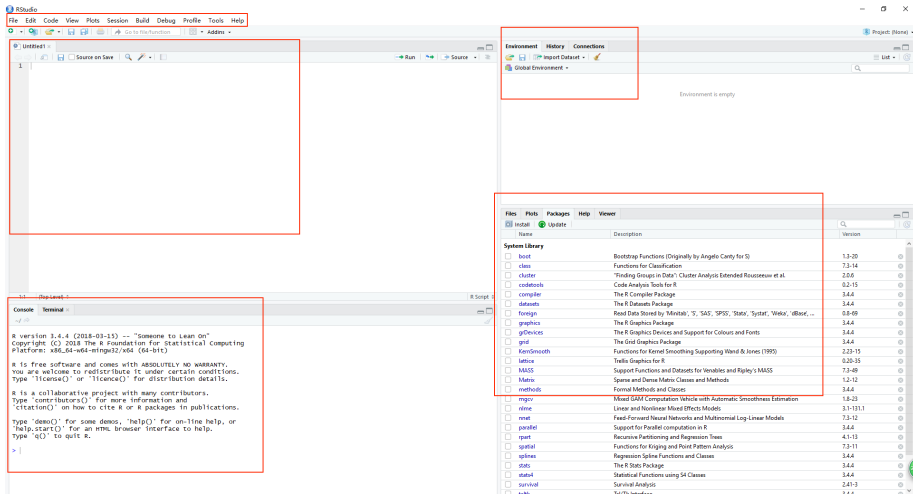
Download and Install RStudio

RStudio is a set of integrated tools designed to help you be more productive with R. You can just select *RStudio Desktop for free* when you **download RStudio**, and then choose the suitable version for your platform.

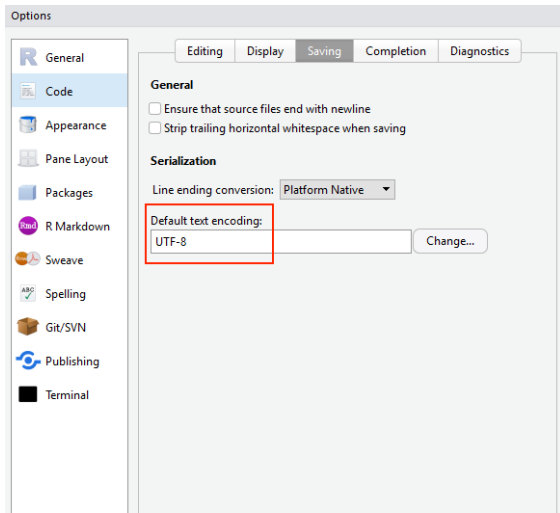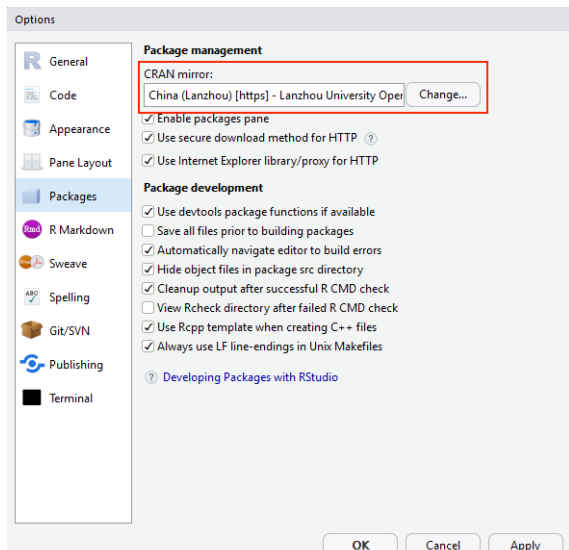| RStudio Desktop Open Source License	RStudio Desktop Commercial License	RStudio Server Open Source License	RStudio Server Pro Commercial License	RStudio Server Pro + RStudio Connect Commercial License
FREE	$995 per year	FREE	$9,995 per year	$29,995 per year
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RStudio Introduction

- Interface

RStudio Introduction

Firstly, you should set the text encoding as UTF-8 (Tools -> Global Options -> Code -> Saving) to prevent Chinese characters being displayed unproperly.

RStudio Introduction

Secondly, you should change the CRAN mirror to the server beginning with China (Tools -> Global Options -> Packages).

Markdown Syntax

1. Section headers

- `# First-level header`
- `## Second-level header`
- `### Third-level header`

There are at most six levels.

Markdown Syntax

2. Emphasis

- `_italic_` or `*italic*` prints *italic*
- `**bold**` prints **bold**

Markdown Syntax

③ Lists

3.1 Unordered list

```
*list or -list or +list
```

The output is:

- list

- you can nest one list within another list by indenting the sub-list

e.g.,

```
- list
    - list
    - list
```

The output is:

- list
    - list
    - list

3.2 Ordered list

```
1. the first item
2. the second item
```

The output is:

1. the first item
2. the second item

Markdown Syntax

4. Images

```
![image title](the path of image)
```
e.g., `![Fig. 1](/Users/cyy/Documents/myRprojects/fig.1)`

5. Links

```
[text](link)
```
e.g., `[download R](http://cran.r-project.org)`

Markdown Syntax

6. Math expressions

- $formula$ prints inline LaTeX equations.
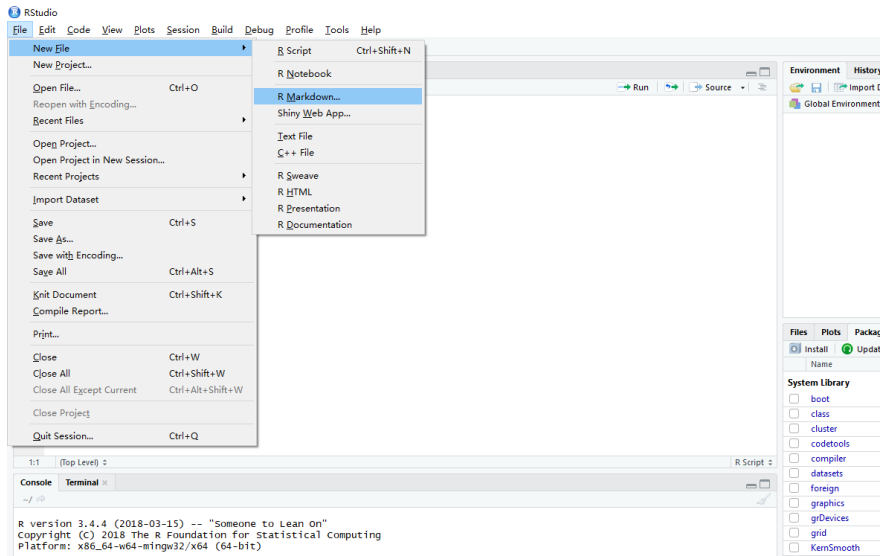- $$formula$$ list the LaTeX equations separately.

- Subscript: CO_2 prints CO_2
- Superscript: X^2 prints X^2
- Fraction: $\frac{a}{b}$ prints $\frac{a}{b}$
- Integration: $\int_0^1$ prints $\int_0^1$
- Summation: $\sum\nolimits_{i=1}$ prints $\sum_{i=1}$ or
  $\sum\limits_{i=1}$ prints $\sum\limits_{i=1}$
- Limit: $\lim\limits_{x\rightarrow 0}$ prints $\lim\limits_{x\rightarrow 0}$

Markdown Syntax

For more information, you can click at **The guide of R Markdown**.

Markdown File Creation

1. File -> New File -> R Markdown

Markdown File Creation

2. In RStudio, it will ask you to download all necessary packages automatically. And then you can select the particular type of the markdown file you want to create, e.g., word, HTML and pdf.

R Install Required Packages   ?   ×

Creating R Markdown documents requires updated versions of the following packages: evaluate, digest, highr, markdown, stringr, yaml, Rcpp, htmltools, caTools, bitops, knitr, jsonlite, base64enc, rprojroot, rmarkdown.

Do you want to install these packages now?

Yes   No

Markdown File Output

1. Two settings

- Tools -> Global Option -> Sweave -> Weave Rnw files using -> knitr
- Tools -> Global Option -> Sweave -> Typeset LaTeX into PDF using -> XeLaTeX

2. Notes

When you finish your markdown file, you should click at **Knit** button to build the final file. There is no problem to create a word or HTML file. But when you want to create a pdf, you should download **Tex** extra.

- **Download Link For Windows (MiKTeX)**
- **Download Link For Mac (MacTeX)**

About Chinese characters Output in pdf

Similarly, there is no problem in exporting Chinese characters in word or HTML, but you need to pay attention to it in pdf.

1. For Windows

Download CTeX, which contains MiKTeX (so you don't need to download MiKTeX additionally). And at the beginning of the markdown file, edit the following settings:

```
output:
  pdf_document:
    LaTeX_engine: xeLaTeX
    header-includes:
      - \usepackage{ctex}
```

2. For Mac

After downloading MacTeX, please try to *install.packages("rticles")*. There are many templates in this package, includes CTeX document.

Other Online Editors Recommended

1. https://dillinger.io/ (limited math capability)
2. https://stackedit.io/editor (latex support, no pdf convertibility)