

R Markdown

解決轉換中文字型PDF

R 大數據分析

李明昌

2024-09-15

第 1 章 R Markdown 簡介

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

這是一個 R Markdown 文件。Markdown 是一種用於創作 HTML、PDF 和 MS Word 文件的簡單格式語法。有關使用 R Markdown 的更多詳細信息，請參閱 <http://rmarkdown.rstudio.com>。

Lee, Ming-Chang

<https://www.youtube.com/@alan9956>

<http://rwepa.blogspot.com/>

alan9956@gmail.com

Outline

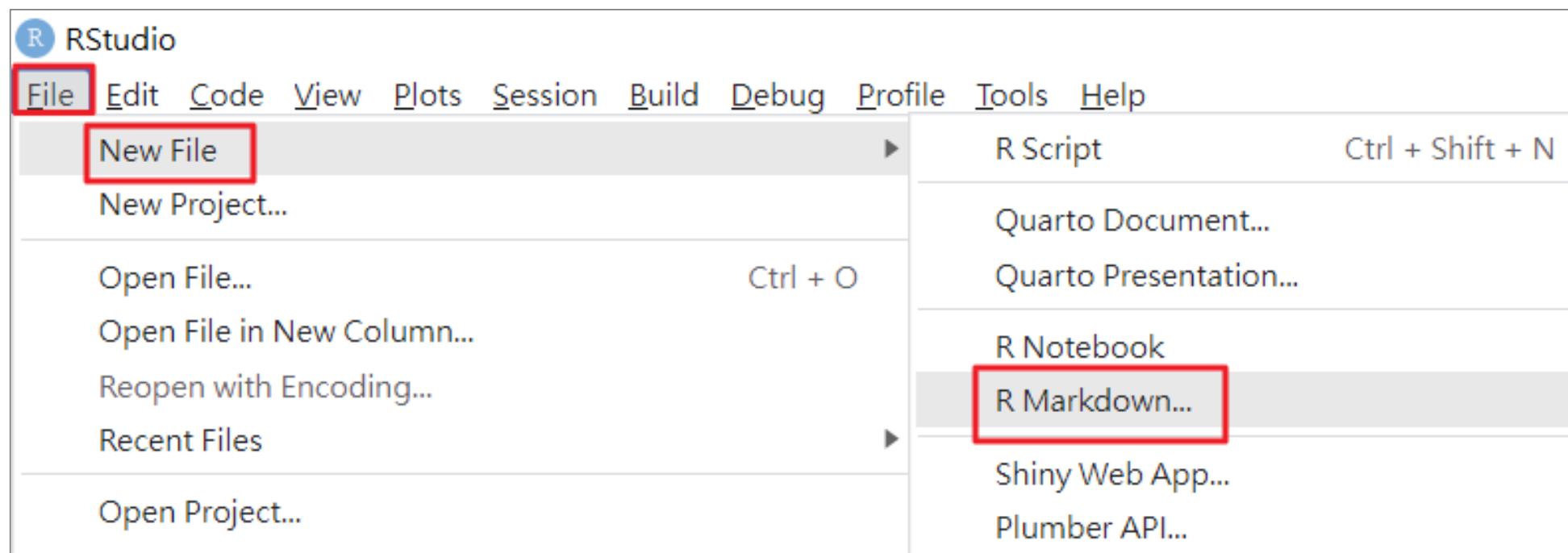
- 1.建立 R Markdown
- 2.加入中文字型
- 3.解決轉換中文字型PDF
- 4.R Markdown 使用
- 5.結論

1.建立 R Markdown

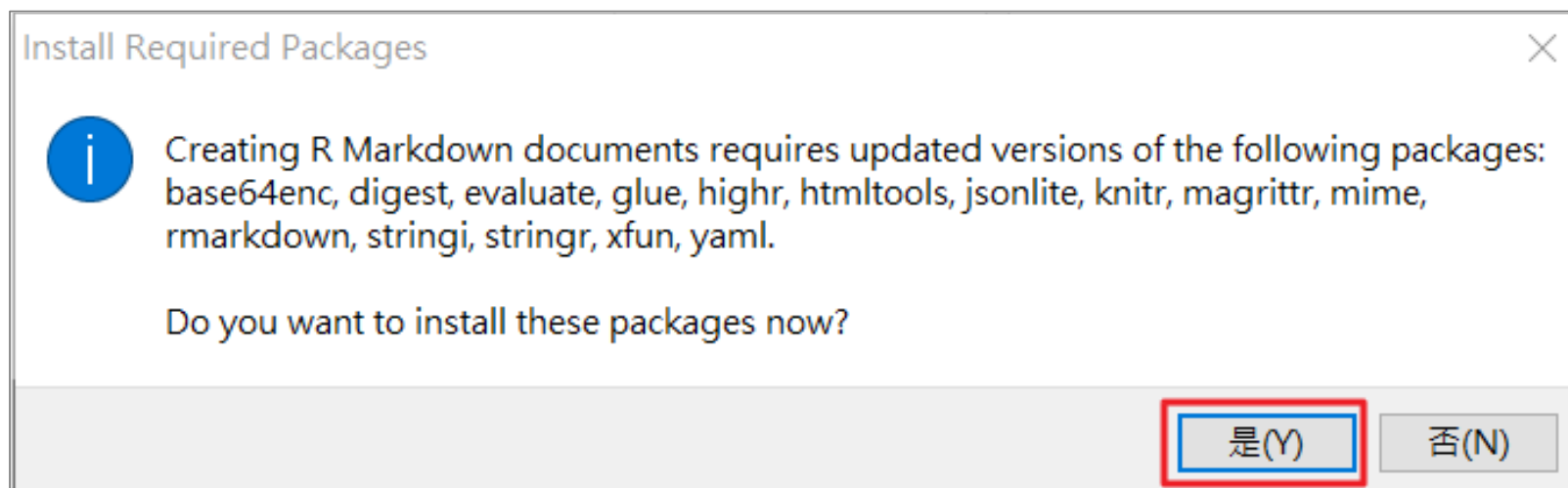
下載: <https://github.com/rwepa/DataDemo/blob/master/rmarkdown-test.Rmd>

新增 Rmd 檔案

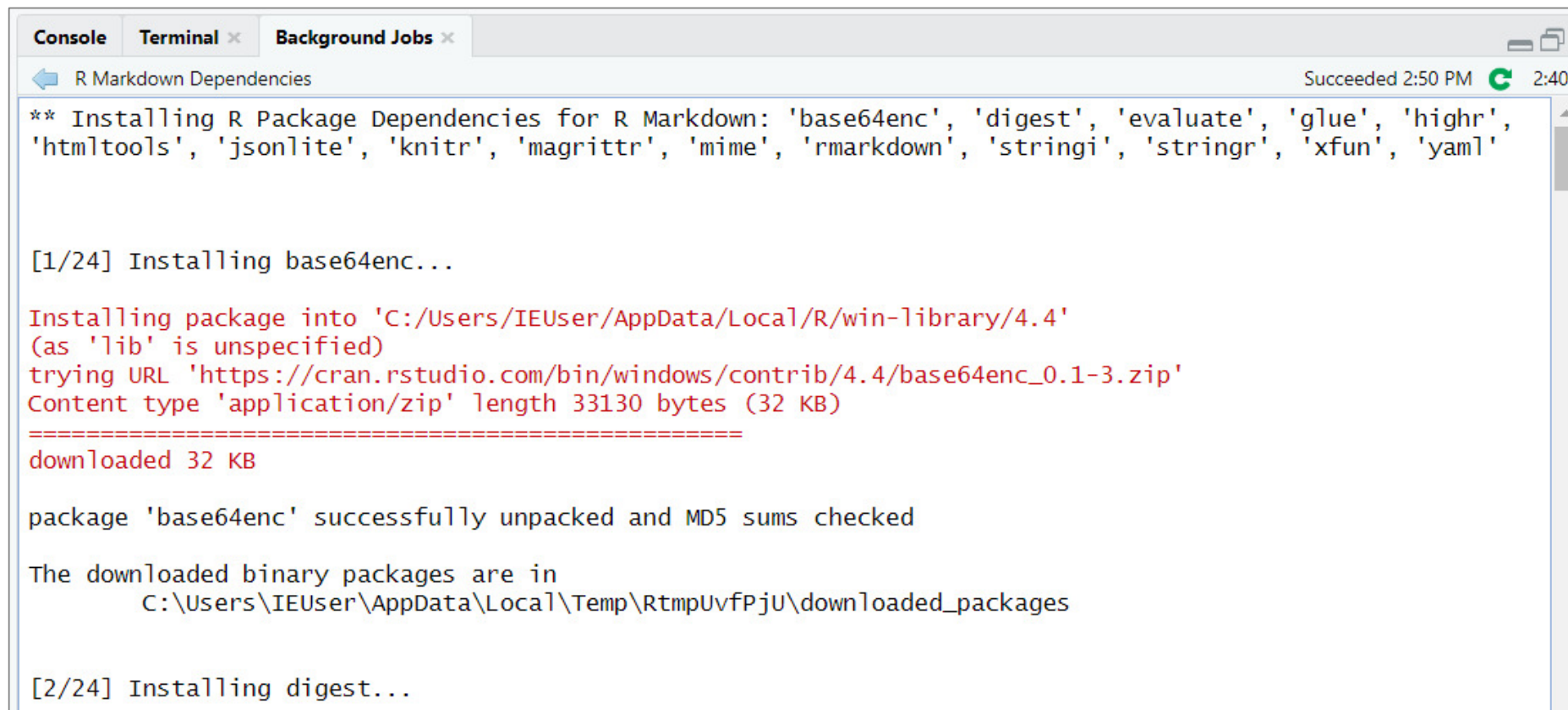
- File \ New File \ R Markdown



第一次使用須安裝套件



安裝24個套件畫面



The screenshot shows the R Studio console window with three tabs: Console, Terminal, and Background Jobs. The Console tab is active, displaying the output of the R Markdown dependencies installation. The text in the console is as follows:

```
R Markdown Dependencies Succeeded 2:50 PM 2:40

** Installing R Package Dependencies for R Markdown: 'base64enc', 'digest', 'evaluate', 'glue', 'highr',
'htmltools', 'jsonlite', 'knitr', 'magrittr', 'mime', 'rmarkdown', 'stringi', 'stringr', 'xfun', 'yaml'

[1/24] Installing base64enc...

Installing package into 'C:/Users/IEUser/AppData/Local/R/win-library/4.4'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.4/base64enc_0.1-3.zip'
Content type 'application/zip' length 33130 bytes (32 KB)
=====
downloaded 32 KB

package 'base64enc' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:\Users\IEUser\AppData\Local\Temp\RtmpUvfPjU\downloaded_packages

[2/24] Installing digest...
```

New R Markdown 視窗

New R Markdown

☒ Document

☐ Presentation

☐ Shiny

☐ From Template

Title: R big data

Author: ALAN LEE

Date: 2024-09-15

☐ Use current date when rendering document

Default Output Format:

☒ HTML
Recommended format for authoring (you can switch to PDF or Word output anytime).

☐ PDF
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).

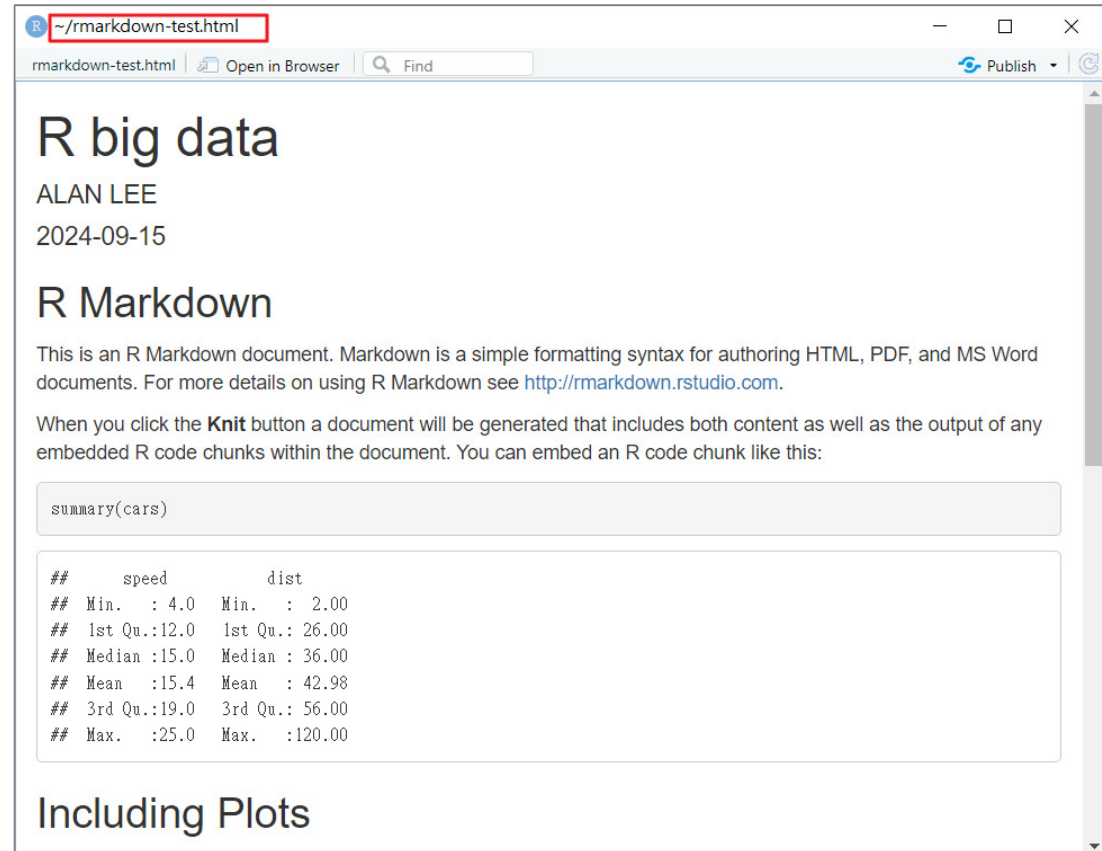
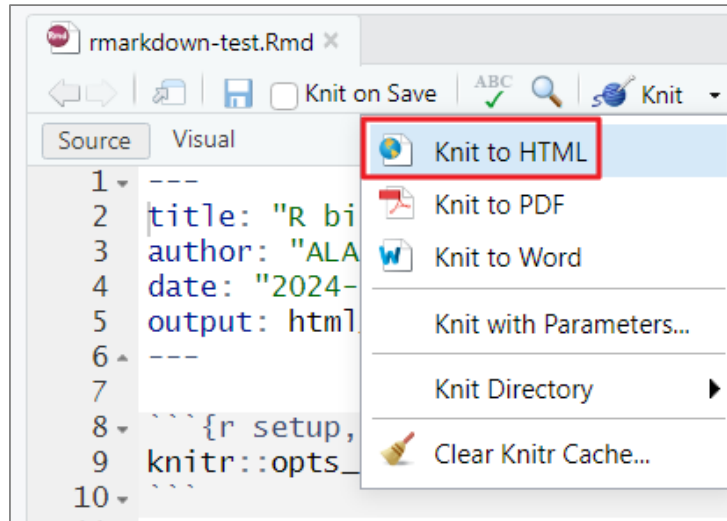
☐ Word
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

Create Empty Document

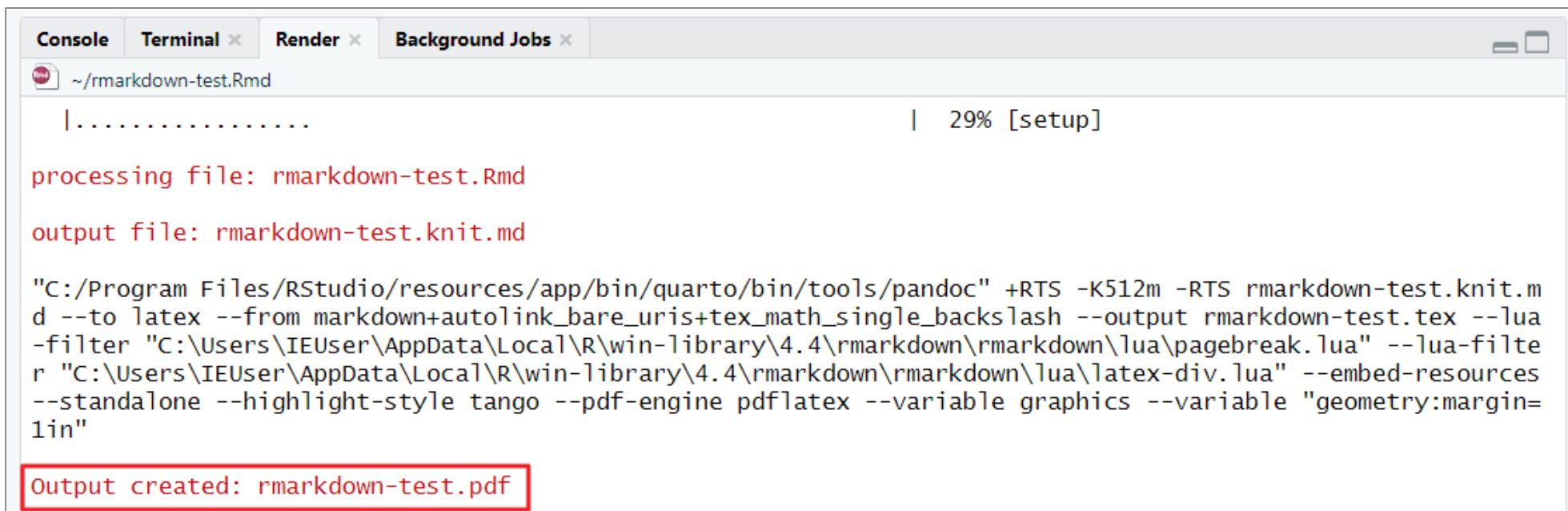
OK Cancel

Knit to HTML

- File \ Save \ rmarkdown-test.Rmd



Knit to PDF



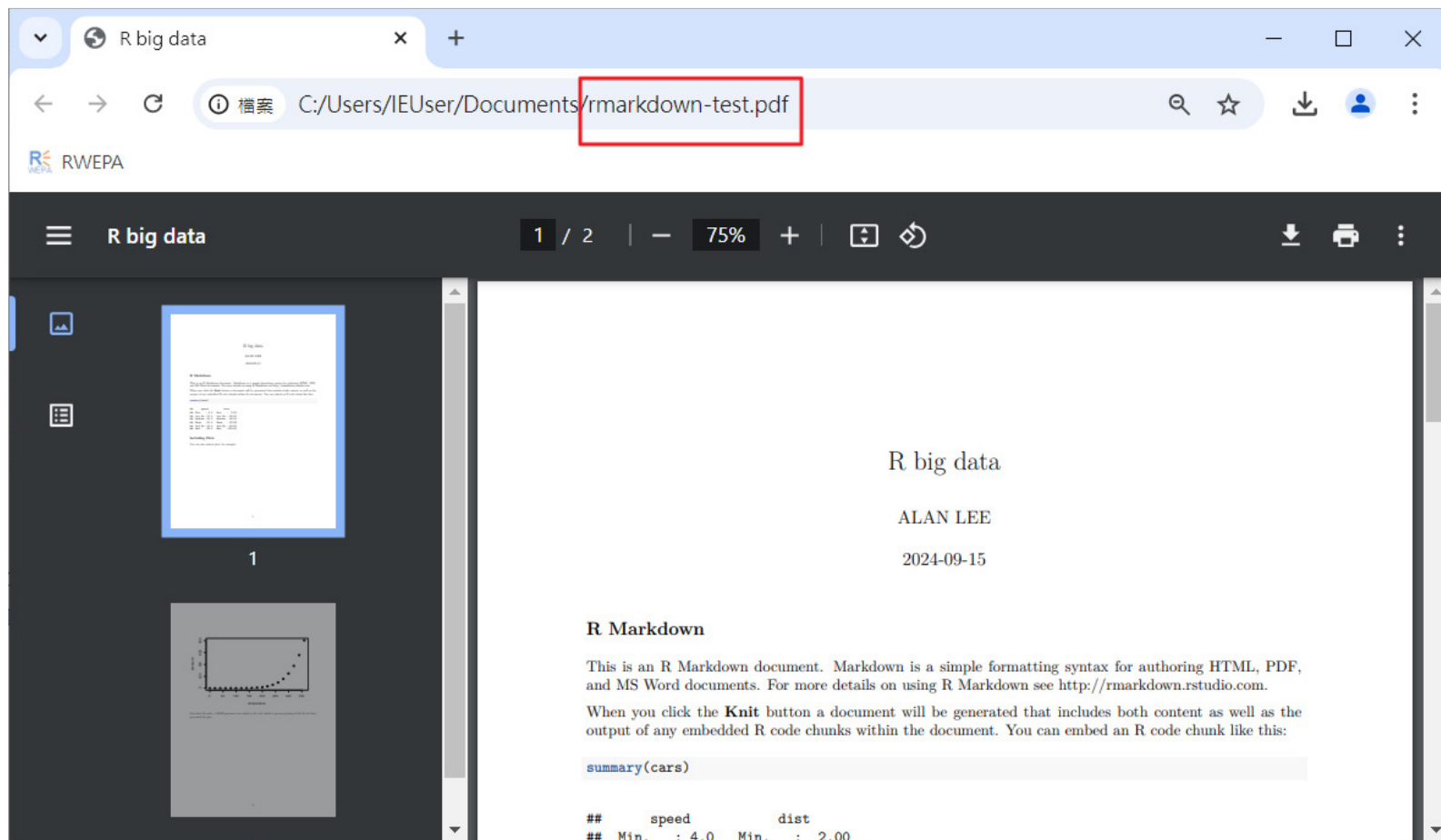
The screenshot shows the RStudio interface with the Console tab selected. The console displays the progress of knitting the file `~/rmarkdown-test.Rmd`. It shows the file is being processed and the output file `rmarkdown-test.knit.md` is generated. The command used to knit the file is shown, including options for the pandoc engine, output format (latex), and various options for the LaTeX engine (pdflatex). The command is: `"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-test.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output rmarkdown-test.tex --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\latex-div.lua" --embed-resources --standalone --highlight-style tango --pdf-engine pdflatex --variable graphics --variable "geometry:margin=1in"`. The final output is `Output created: rmarkdown-test.pdf`, which is highlighted with a red box.

```
Console Terminal x Render x Background Jobs x
~/rmarkdown-test.Rmd
|.....| 29% [setup]
processing file: rmarkdown-test.Rmd
output file: rmarkdown-test.knit.md

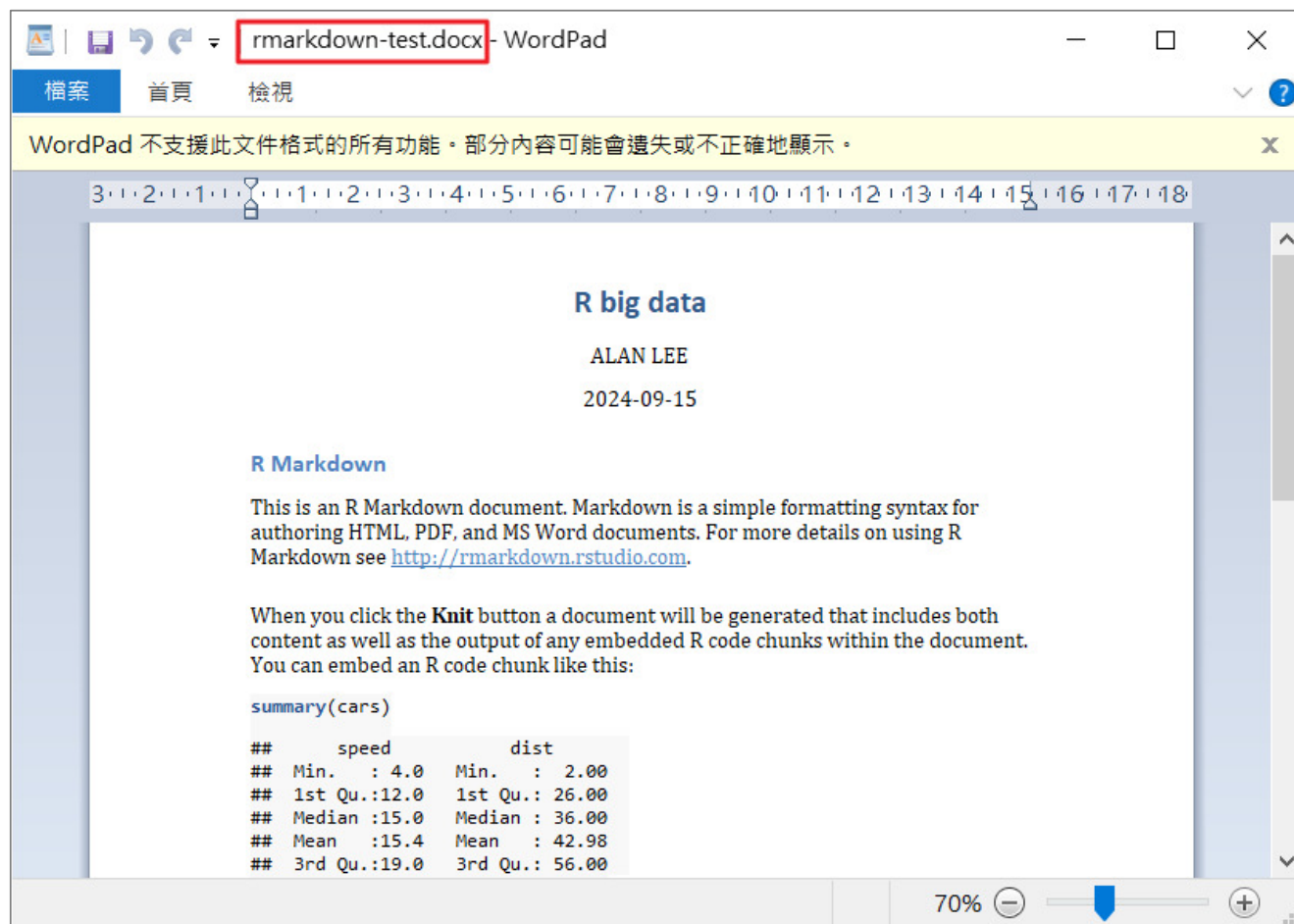
"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-test.knit.m
d --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output rmarkdown-test.tex --lua
-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\pagebreak.lua" --lua-filte
r "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\latex-div.lua" --embed-resources
--standalone --highlight-style tango --pdf-engine pdflatex --variable graphics --variable "geometry:margin=
1in"

Output created: rmarkdown-test.pdf
```

Knit to PDF (續)



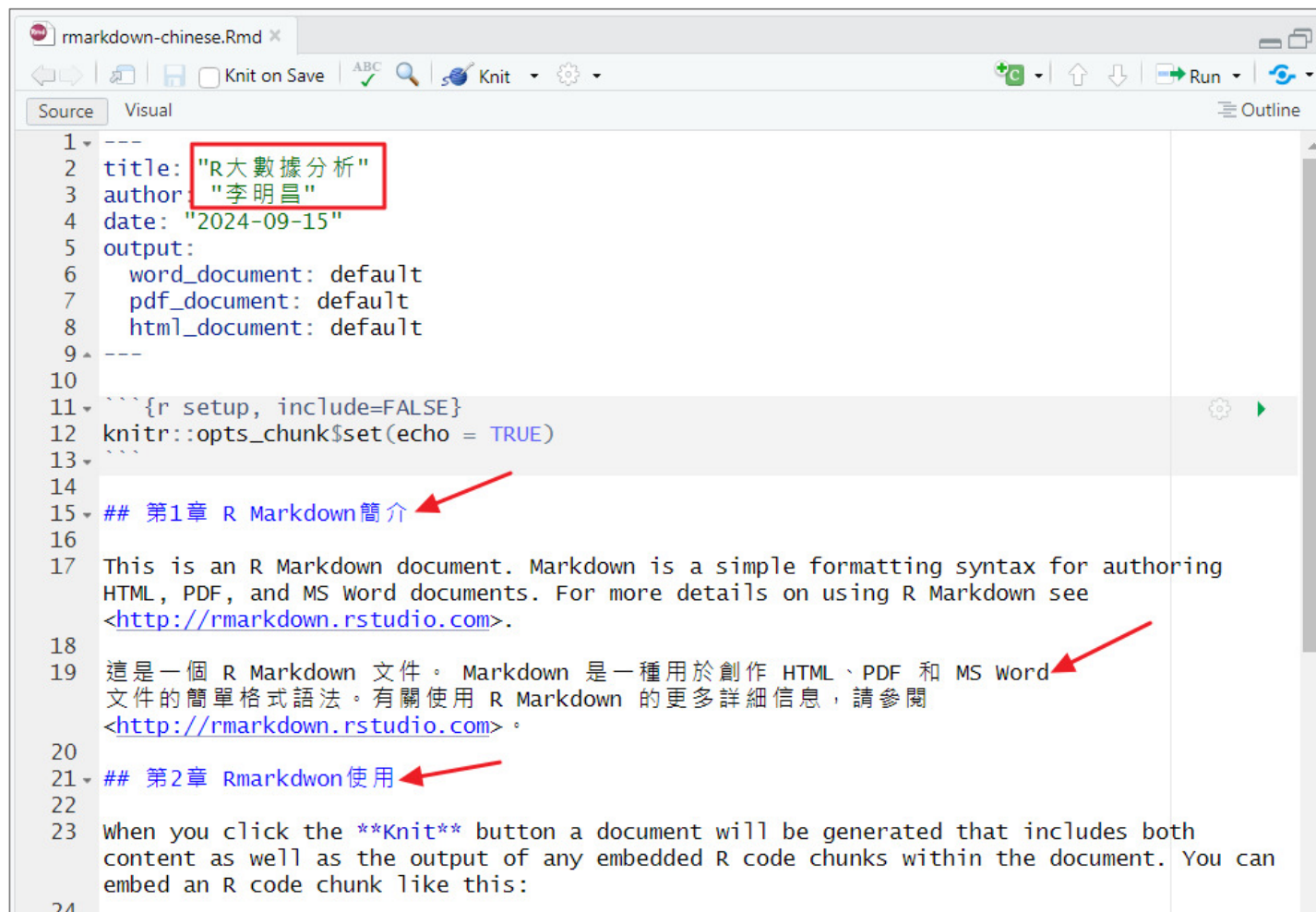
Knit to Word



2.加入中文字型

下載: <https://github.com/rwepa/DataDemo/blob/master/rmarkdown-chinese.Rmd>

rmarkdown-chinese.Rmd



```
1 ---
2 title: "R大數據分析"
3 author: "李明昌"
4 date: "2024-09-15"
5 output:
6   word_document: default
7   pdf_document: default
8   html_document: default
9 ---
10
11 ```{r setup, include=FALSE}
12 knitr::opts_chunk$set(echo = TRUE)
13 ```
14
15 ## 第1章 R Markdown簡介
16
17 This is an R Markdown document. Markdown is a simple formatting syntax for authoring
18 HTML, PDF, and MS Word documents. For more details on using R Markdown see
19 <http://rmarkdown.rstudio.com>.
20
21 這是一個 R Markdown 文件。Markdown 是一種用於創作 HTML、PDF 和 MS Word
22 文件的簡單格式語法。有關使用 R Markdown 的更多詳細信息，請參閱
23 <http://rmarkdown.rstudio.com>。
24
25 ## 第2章 Rmarkdwon使用
26
27 When you click the Knit button a document will be generated that includes both
28 content as well as the output of any embedded R code chunks within the document. You can
29 embed an R code chunk like this:
```

Knit to HTML – 中文正常顯示



R大數據分析

李明昌

2024-09-15

第1章 R Markdown簡介

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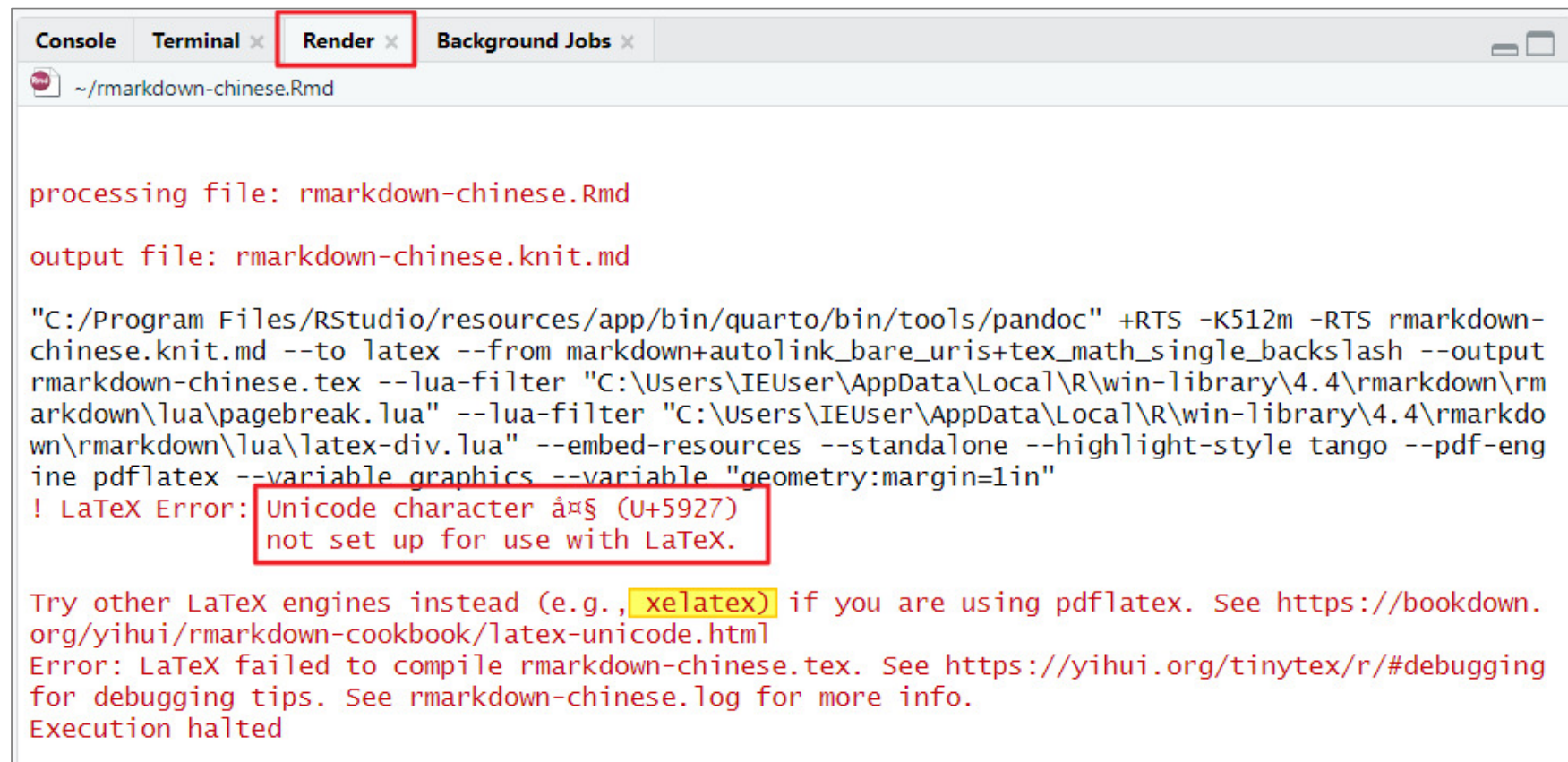
第2章 Rmarkdwon使用

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed      dist
##  Min.   : 4.0   Min.   : 2.00
##  1st Qu.:12.0   1st Qu.:26.00
##  Median :15.0   Median :36.00
##  Mean   :15.4   Mean   :42.00
##  Max.   :44.0   Max.   :53.00
```

Knit to PDF – 中文 Error!



The screenshot shows the RStudio interface with the 'Render' tab selected. The console displays the output of the 'knit' function, including the file being processed, the output file, and the command used to generate the PDF. A red box highlights the error message: '! LaTeX Error: Unicode character ǎǎǎ (U+5927) not set up for use with LaTeX.' Below the error, there is a suggestion to try other LaTeX engines like xelatex and a link to a troubleshooting page. The console also shows that the execution was halted.

```
processing file: rmarkdown-chinese.Rmd

output file: rmarkdown-chinese.knit.md

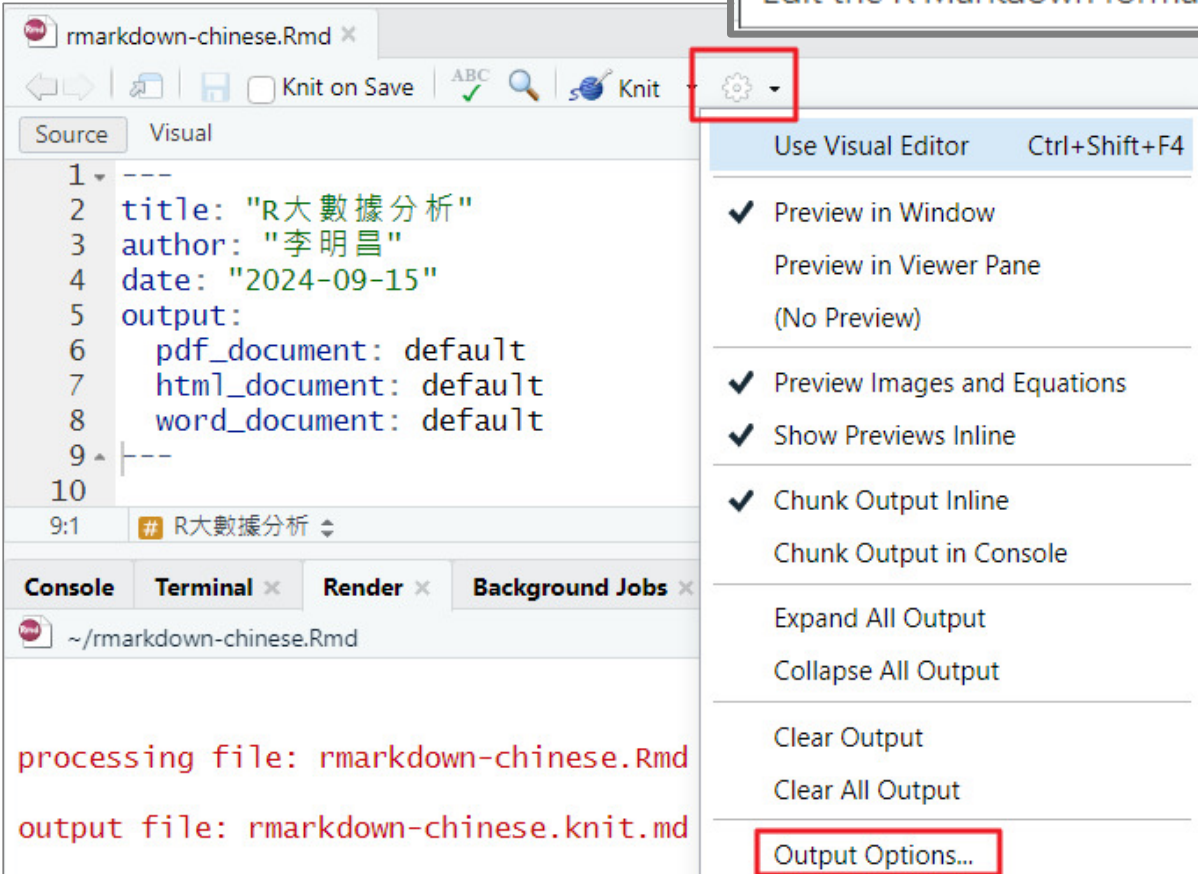
"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-
chinese.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output
rmarkdown-chinese.tex --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rm
arkdown\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdo
wn\rmarkdown\lua\latex-div.lua" --embed-resources --standalone --highlight-style tango --pdf-eng
ine pdflatex --variable graphics --variable "geometry:margin=1in"
! LaTeX Error: Unicode character ǎǎǎ (U+5927)
not set up for use with LaTeX.

Try other LaTeX engines instead (e.g., xelatex) if you are using pdflatex. See https://bookdown.
org/yihui/rmarkdown-cookbook/latex-unicode.html
Error: LaTeX failed to compile rmarkdown-chinese.tex. See https://yihui.org/tinytex/r/#debugging
for debugging tips. See rmarkdown-chinese.log for more info.
Execution halted
```


Output Options

- Edit \ Output Options

Edit the R Markdown format options for the current file

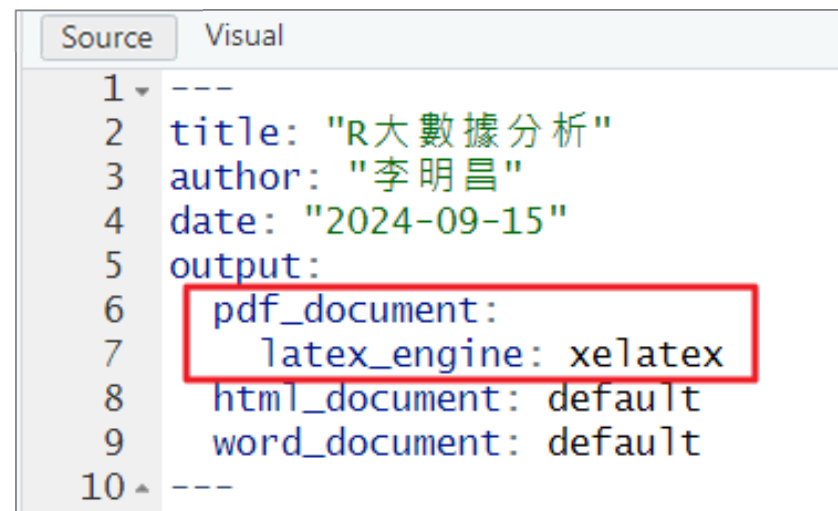
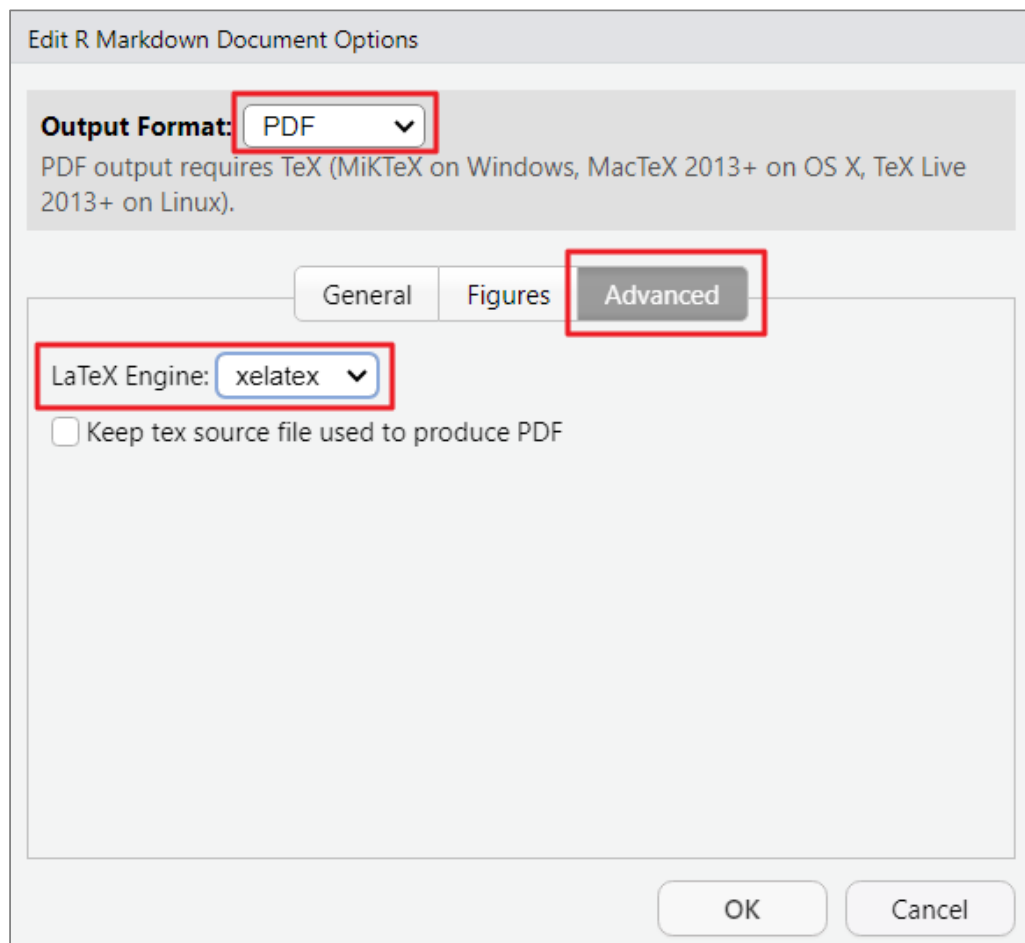


The screenshot shows the RStudio interface with the 'rmarkdown-chinese.Rmd' file open. The 'Knit' button in the toolbar has a gear icon, which is highlighted with a red box. A context menu is open, displaying the following options:

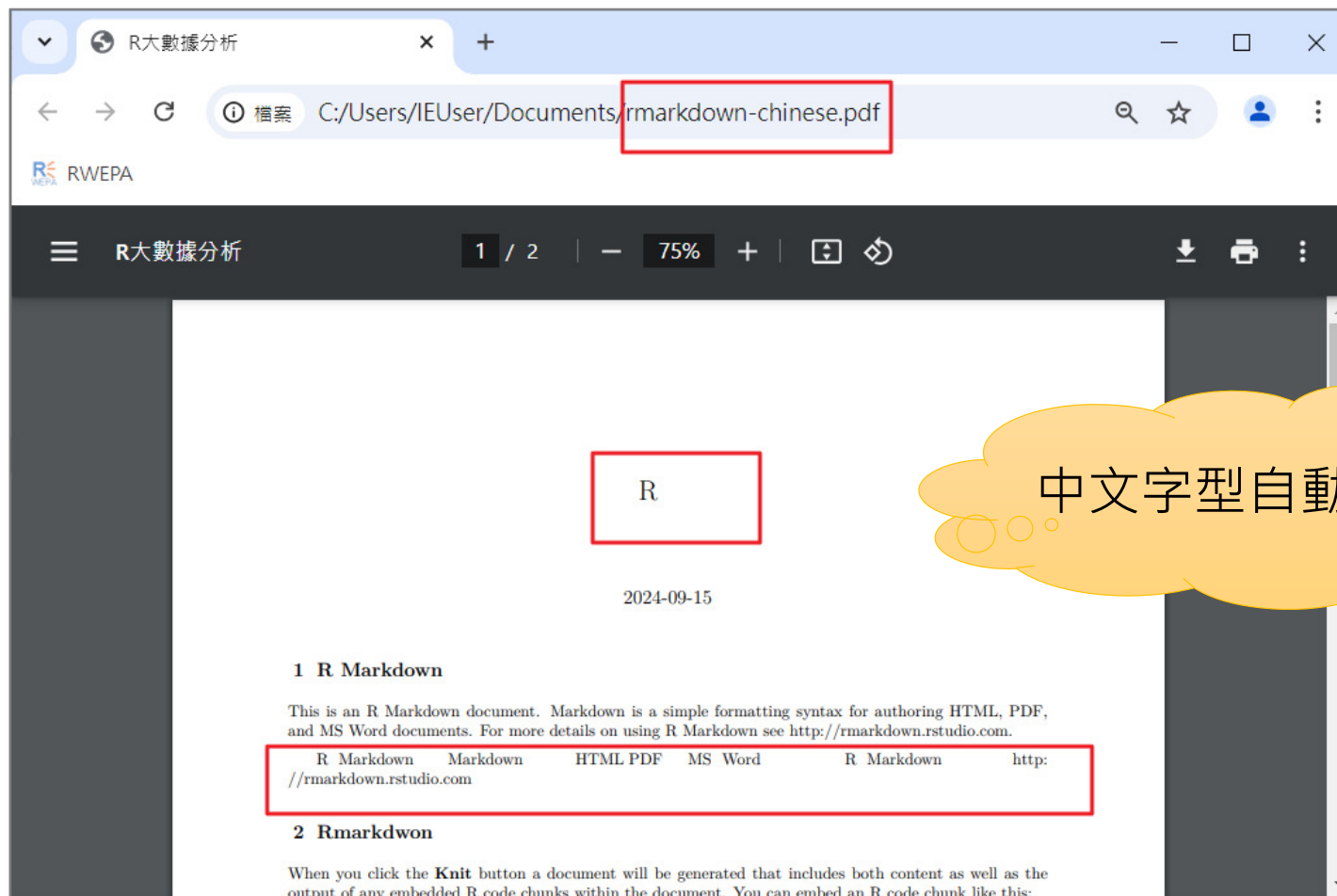
- Use Visual Editor (Ctrl+Shift+F4)
- ✓ Preview in Window
 - Preview in Viewer Pane
 - (No Preview)
- ✓ Preview Images and Equations
- ✓ Show Previews Inline
- ✓ Chunk Output Inline
 - Chunk Output in Console
- Expand All Output
- Collapse All Output
- Clear Output
- Clear All Output
- Output Options...** (highlighted with a red box)

The background shows the R Markdown source code with a title, author, date, and output settings. The console at the bottom displays the message: 'processing file: rmarkdown-chinese.Rmd' and 'output file: rmarkdown-chinese.knit.md'.

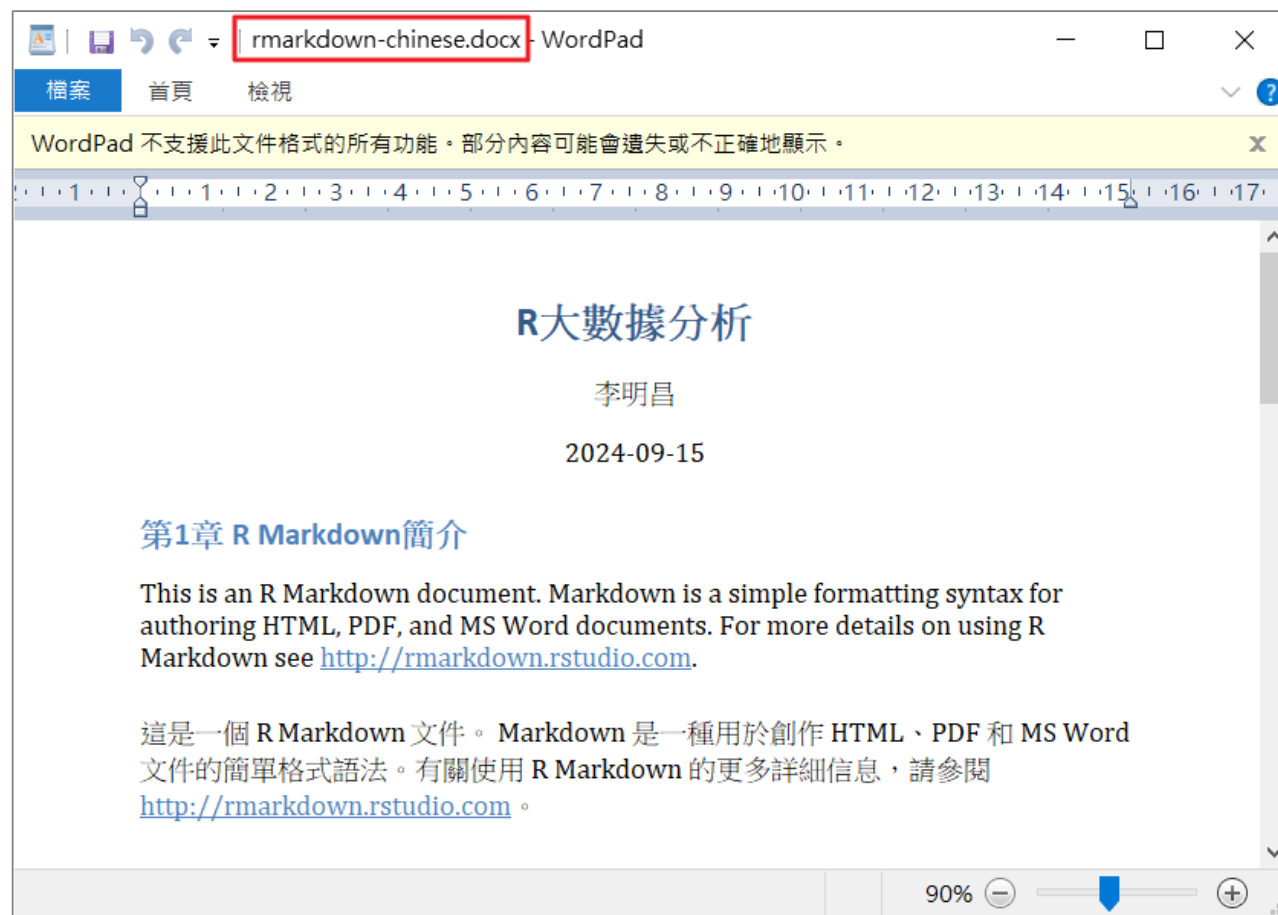
LaTex Engine: xelatex



Knit to PDF – 中文 仍有Error 唉!



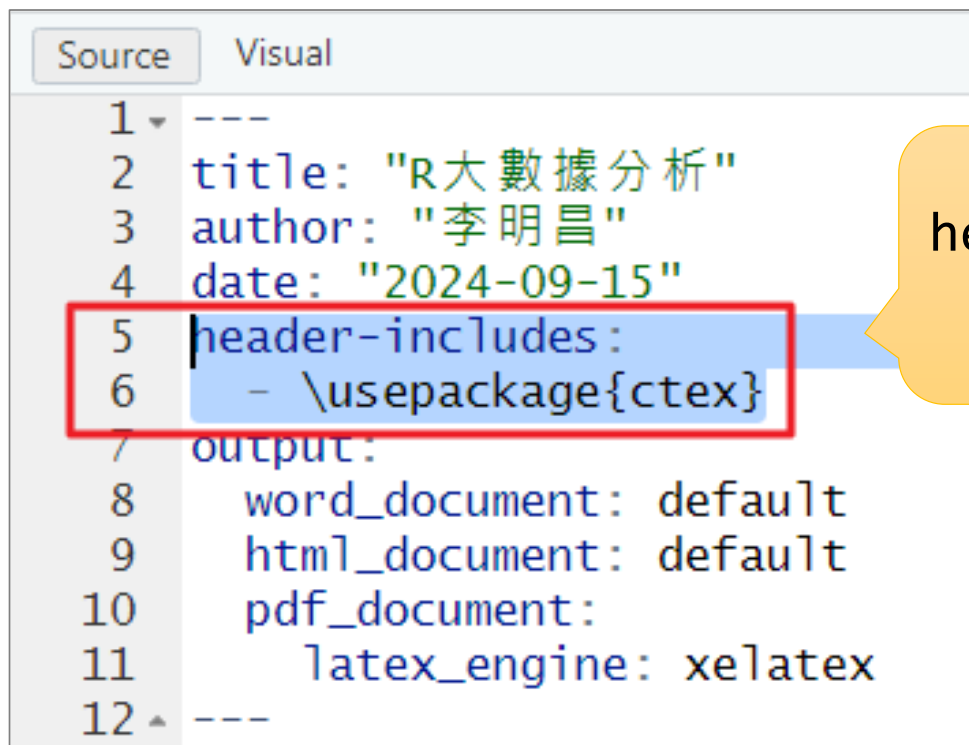
Knit to Word – 中文正常顯示



3.解決轉換中文字型PDF

usepackage{ctex}

- 使用 ctex 套件 (<https://ctex.org/>)
- 新增 2 行程式碼



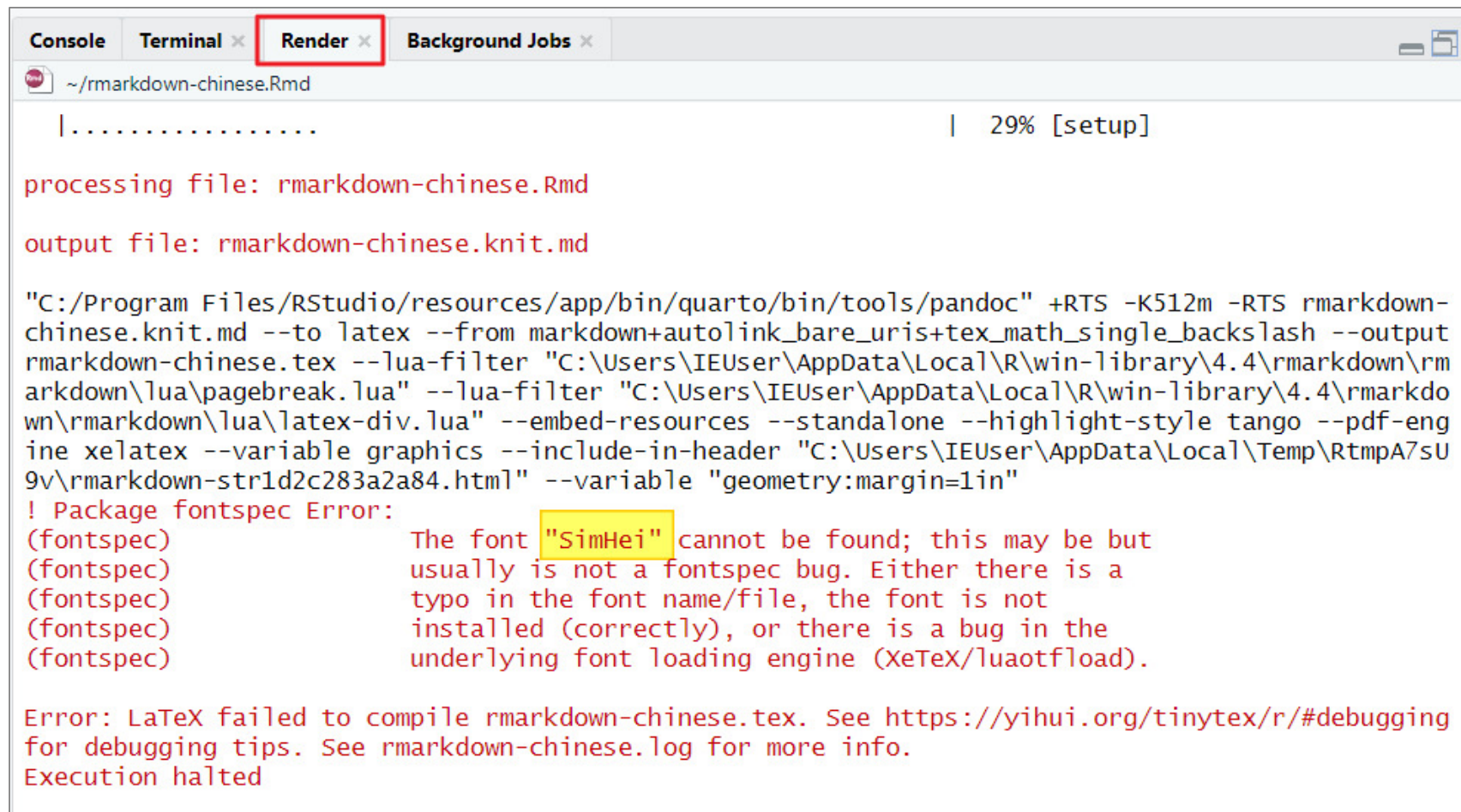
The screenshot shows a code editor with two tabs: 'Source' and 'Visual'. The 'Source' tab is active, displaying a YAML header for an R Markdown document. The code is as follows:

```
1 ---
2 title: "R大數據分析"
3 author: "李明昌"
4 date: "2024-09-15"
5 header-includes:
6   - \usepackage{ctex}
7 output:
8   word_document: default
9   html_document: default
10  pdf_document:
11    latex_engine: xelatex
12 ---
```

A red rectangular box highlights lines 5 and 6, which define the `header-includes` section. A blue arrow points from this box to a yellow callout box on the right.

header-includes:
- \usepackage{ctex}

第1次Render - 缺少 SimHei 字型 (黑體)



The screenshot shows the RStudio interface with the 'Render' tab selected. The console displays the output of rendering an R Markdown file. It shows the file being processed, the output file, and the command used to compile the LaTeX document. The command includes various options for the pandoc engine, including the use of XeLaTeX and specific Lua filters. The error message indicates that the font 'SimHei' cannot be found, which is a common issue when rendering Chinese documents in R Markdown. The error message is repeated five times, and the console ends with 'Error: LaTeX failed to compile rmarkdown-chinese.tex. See https://yihui.org/tinytex/r/#debugging for debugging tips. See rmarkdown-chinese.log for more info. Execution halted'.

```

Console Terminal Render Background Jobs
~/rmarkdown-chinese.Rmd
|.....| 29% [setup]

processing file: rmarkdown-chinese.Rmd

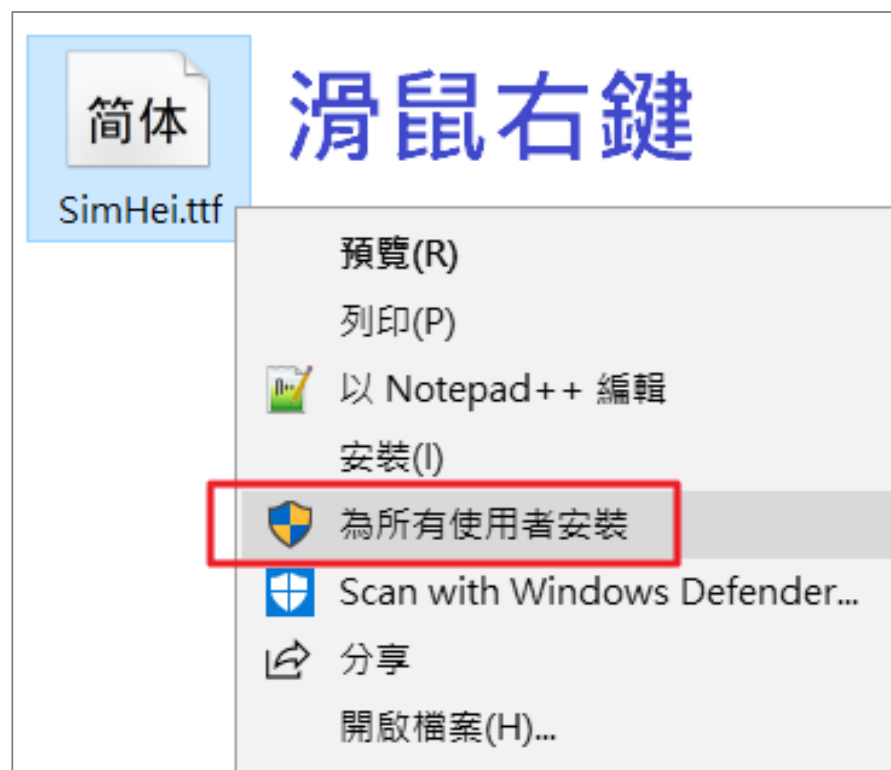
output file: rmarkdown-chinese.knit.md

"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-
chinese.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output
rmarkdown-chinese.tex --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rm
arkdown\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdo
wn\rmarkdown\lua\latex-div.lua" --embed-resources --standalone --highlight-style tango --pdf-eng
ine xelatex --variable graphics --include-in-header "C:\Users\IEUser\AppData\Local\Temp\RtmpA7SU
9v\rmarkdown-str1d2c283a2a84.html" --variable "geometry:margin=1in"
! Package fontspec Error:
(fontspec) The font "SimHei" cannot be found; this may be but
(fontspec) usually is not a fontspec bug. Either there is a
(fontspec) typo in the font name/file, the font is not
(fontspec) installed (correctly), or there is a bug in the
(fontspec) underlying font loading engine (XeTeX/luatex).

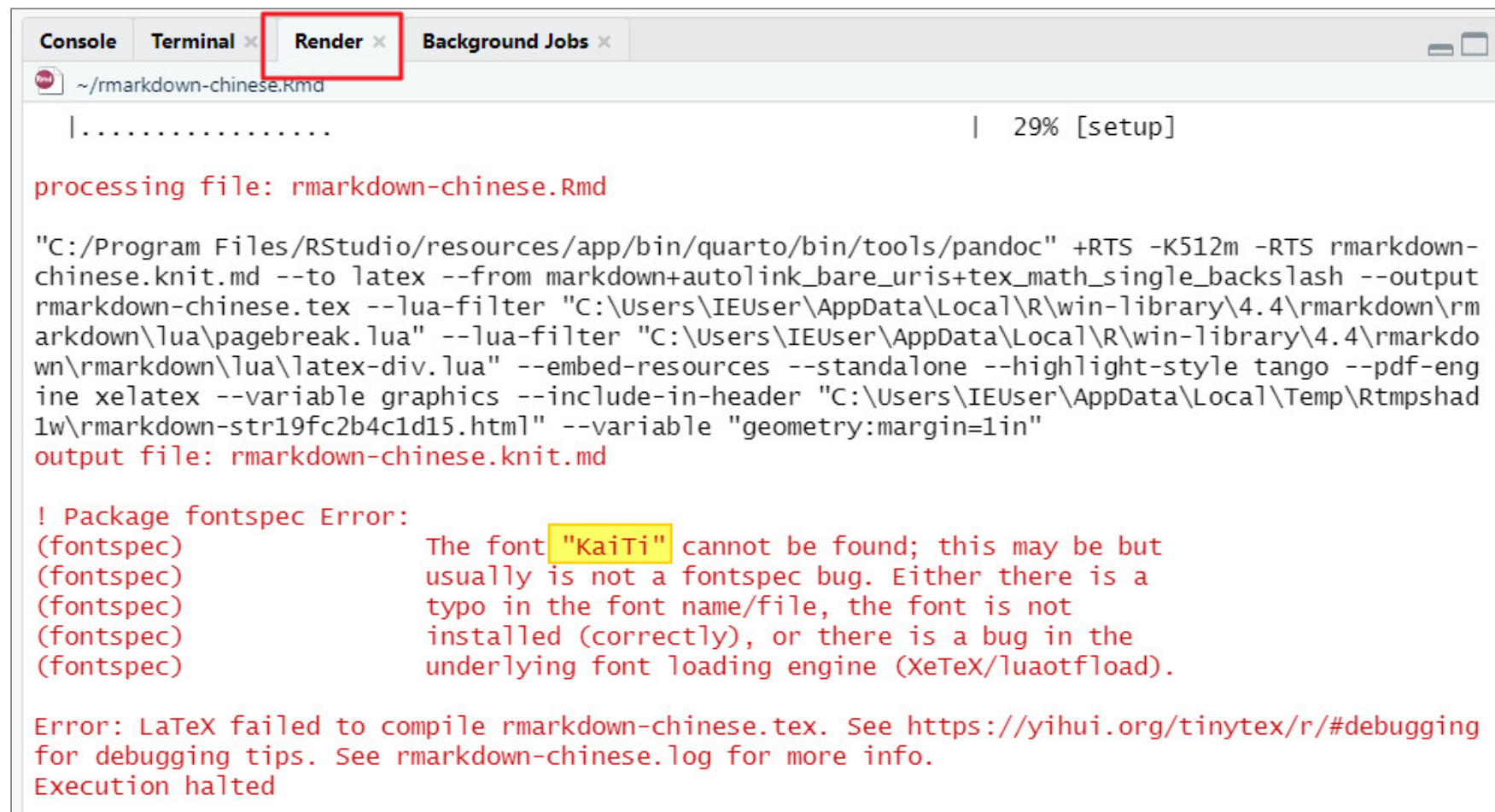
Error: LaTeX failed to compile rmarkdown-chinese.tex. See https://yihui.org/tinytex/r/#debugging
for debugging tips. See rmarkdown-chinese.log for more info.
Execution halted
  
```

下載與安裝 SimHei.ttf

- 下載: <https://github.com/rwepa/DataDemo/blob/master/fonts/SimHei.ttf>
- 安裝: 滑鼠右鍵 \ 為所有使用者安裝



第2次Render - 缺少 KaiTi 字型 (楷體)



The screenshot shows the RStudio interface with the 'Render' tab selected. The console displays the following output:

```

|.....| 29% [setup]

processing file: rmarkdown-chinese.Rmd

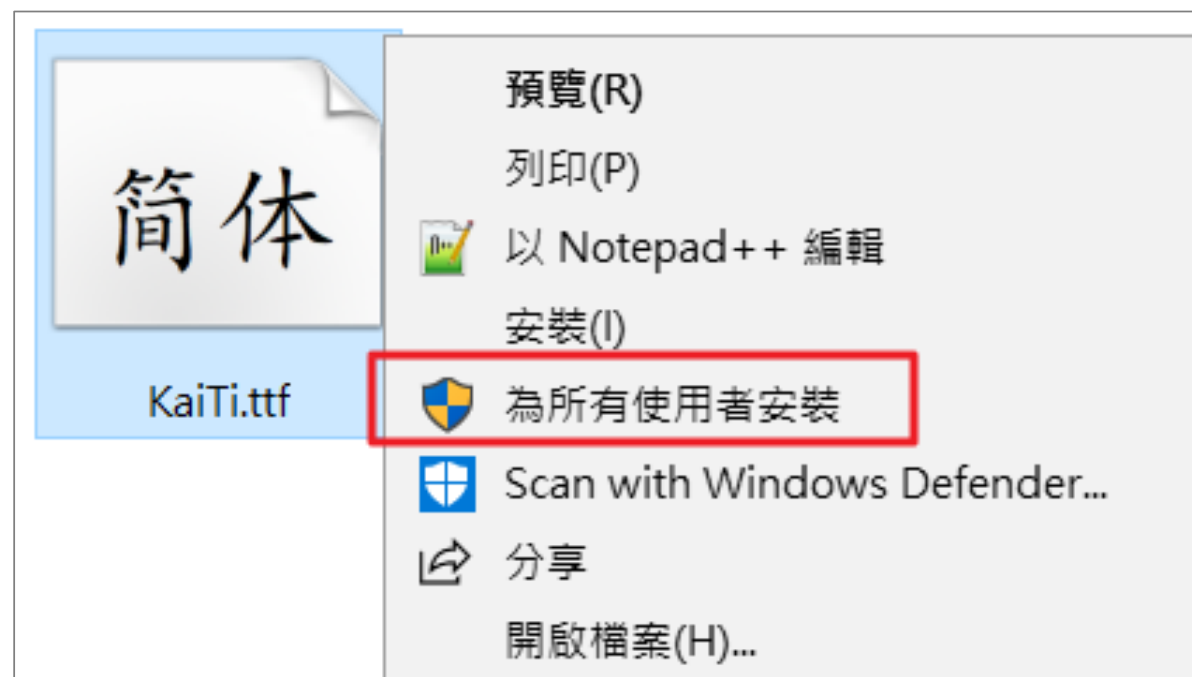
"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-
chinese.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output
rmarkdown-chinese.tex --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rm
arkdown\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdo
wn\rmarkdown\lua\latex-div.lua" --embed-resources --standalone --highlight-style tango --pdf-eng
ine xelatex --variable graphics --include-in-header "C:\Users\IEUser\AppData\Local\Temp\Rtmpshad
1w\rmarkdown-str19fc2b4c1d15.html" --variable "geometry:margin=1in"
output file: rmarkdown-chinese.knit.md

! Package fontspec Error:
(fontspec) The font "KaiTi" cannot be found; this may be but
(fontspec) usually is not a fontspec bug. Either there is a
(fontspec) typo in the font name/file, the font is not
(fontspec) installed (correctly), or there is a bug in the
(fontspec) underlying font loading engine (XeTeX/luatex).

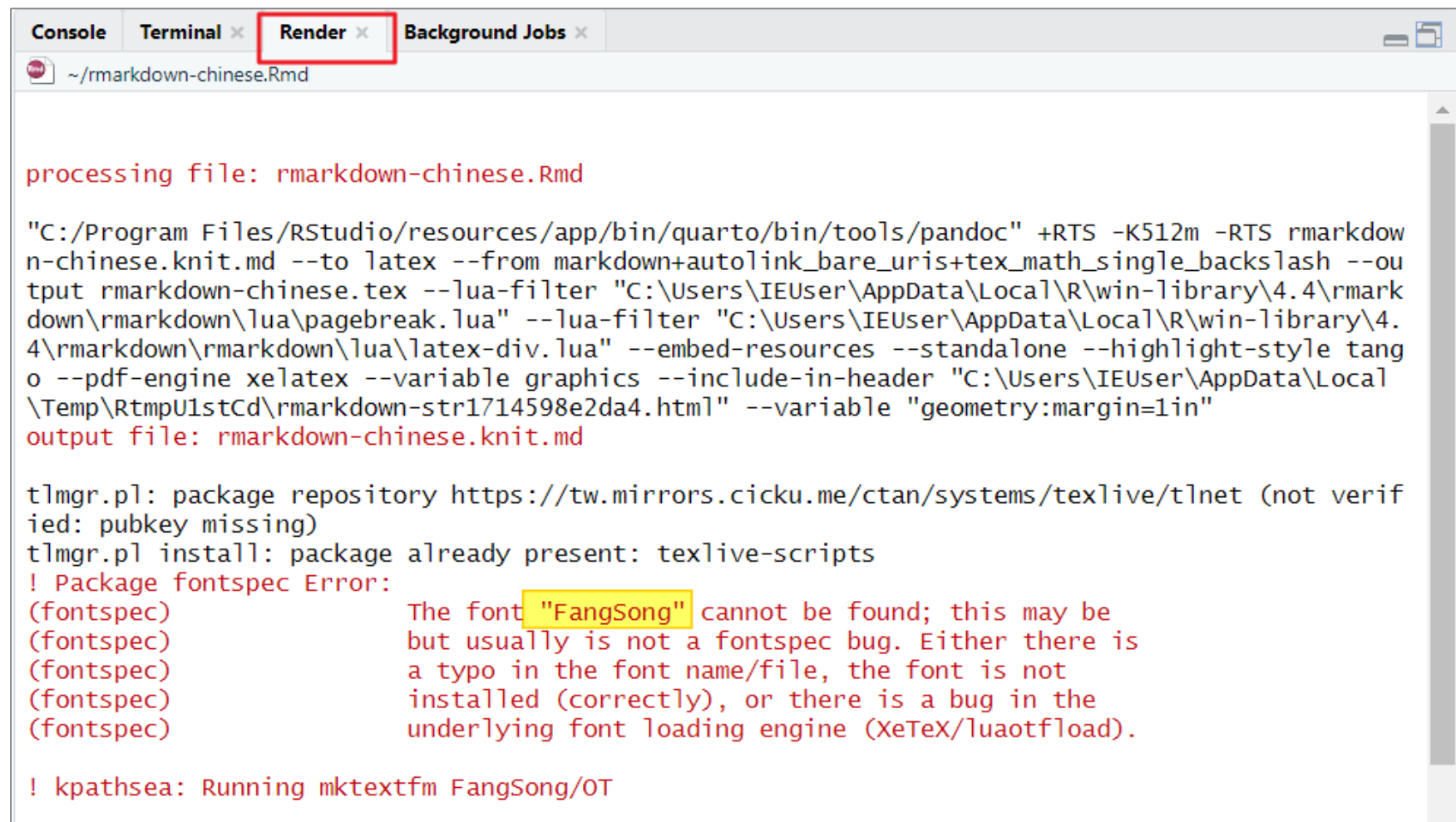
Error: LaTeX failed to compile rmarkdown-chinese.tex. See https://yihui.org/tinytex/r/#debugging
for debugging tips. See rmarkdown-chinese.log for more info.
Execution halted
    
```


下載與安裝 KaiTi.ttf

- 下載: <https://github.com/rwepa/DataDemo/blob/master/fonts/KaiTi.ttf>
- 安裝: 滑鼠右鍵 \ 為所有使用者安裝



第3次Render - 缺少 FangSong 字型 (仿宋)



The screenshot shows the RStudio interface with the 'Render' tab selected. The console displays the output of rendering an R Markdown file. It shows the command used to run pandoc, the output file, and the installation of texlive-scripts. A red error message indicates that the font 'FangSong' cannot be found. The error message is: '! Package fontspec Error: (fontspec) The font "FangSong" cannot be found; this may be (fontspec) but usually is not a fontspec bug. Either there is (fontspec) a typo in the font name/file, the font is not (fontspec) installed (correctly), or there is a bug in the (fontspec) underlying font loading engine (XeTeX/luatex). ! kpathsea: Running mktexfm FangSong/OT'.

```
processing file: rmarkdown-chinese.Rmd

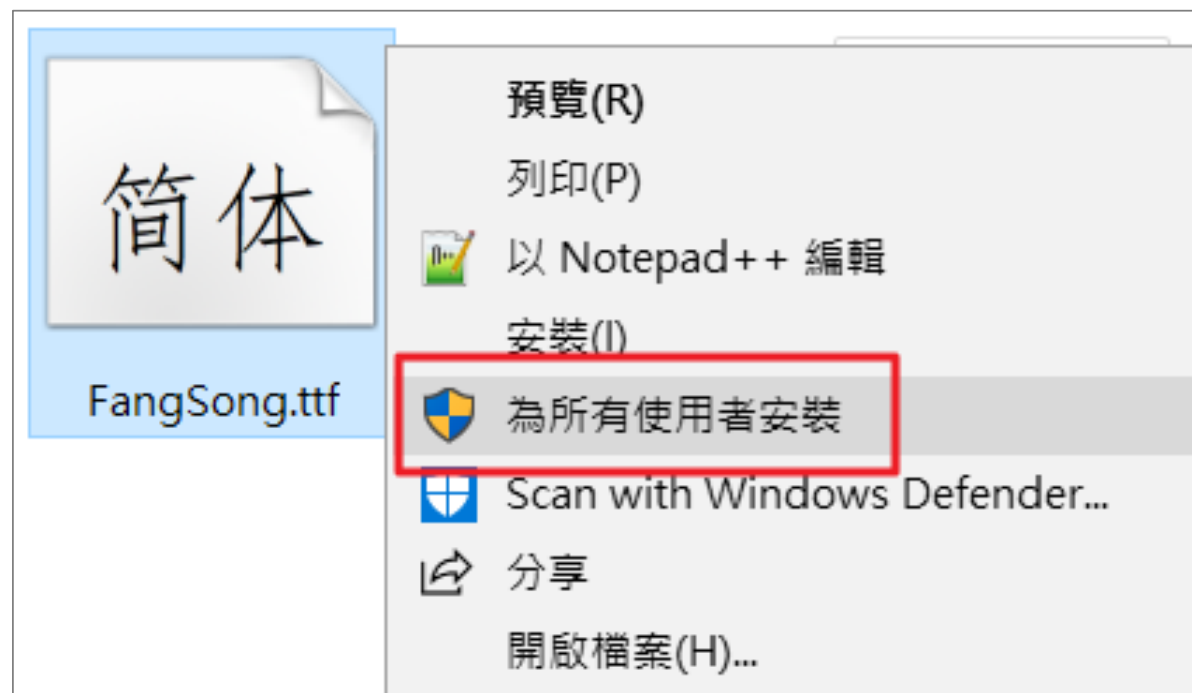
"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-chinese.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output rmarkdown-chinese.tex --lua-filter "C:\Users\IEUser\AppData\Local\Temp\1714598e2da4\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\Temp\1714598e2da4\lua\latex-div.lua" --embed-resources --standalone --highlight-style tang --pdf-engine xelatex --variable graphics --include-in-header "C:\Users\IEUser\AppData\Local\Temp\1714598e2da4\lua\include-in-header.lua" --variable "geometry:margin=1in"
output file: rmarkdown-chinese.knit.md

tlmgr.pl: package repository https://tw.mirrors.cicku.me/ctan/systems/texlive/tlnet (not verified: pubkey missing)
tlmgr.pl install: package already present: texlive-scripts
! Package fontspec Error:
(fontspec) The font "FangSong" cannot be found; this may be
(fontspec) but usually is not a fontspec bug. Either there is
(fontspec) a typo in the font name/file, the font is not
(fontspec) installed (correctly), or there is a bug in the
(fontspec) underlying font loading engine (XeTeX/luatex).

! kpathsea: Running mktexfm FangSong/OT
```

下載與安裝 FangSong.ttf

- 下載: <https://github.com/rwepa/DataDemo/blob/master/fonts/FangSong.ttf>
- 安裝: 滑鼠右鍵 \ 為所有使用者安裝



第4次Render – OK



The screenshot shows the RStudio interface with the 'Render' tab selected in the top bar. The console window displays the following text:

```
processing file: rmarkdown-chinese.Rmd

"C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/pandoc" +RTS -K512m -RTS rmarkdown-chinese.knit.md --to latex --from markdown+autolink_bare_uris+tex_math_single_backslash --output rmarkdown-chinese.tex --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\pagebreak.lua" --lua-filter "C:\Users\IEUser\AppData\Local\R\win-library\4.4\rmarkdown\rmarkdown\lua\latex-div.lua" --embed-resources --standalone --highlight-style tango --pdf-engine xelatex --variable graphics --include-in-header "C:\Users\IEUser\AppData\Local\Temp\RtmpYXsNT\rmarkdown-strc4c61e45ac3.html" --variable "geometry:margin=1in"
output file: rmarkdown-chinese.knit.md

Output created: rmarkdown-chinese.pdf
```

The 'Render' tab and the 'Output created: rmarkdown-chinese.pdf' line are highlighted with red boxes.

rmarkdown-chinese.pdf

The screenshot shows a PDF viewer window with the title 'R 大數據分析'. The address bar shows the file path 'C:/Users/IEUser/Documents/rmarkdown-chinese.pdf'. The document content includes:

- Title Page:**
 - Title: R 大數據分析
 - Author: 李明昌
 - Date: 2024-09-15
- Table of Contents:**
 - 第 1 章 R Markdown 簡介
 - 第 2 章 Rmarkdown 使用
- Chapter 1 Content:**
 - Text: This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.
 - Text: 這是一個 R Markdown 文件。Markdown 是一種用於創作 HTML、PDF 和 MS Word 文件的簡單格式語法。有關使用 R Markdown 的更多詳細信息，請參閱 <http://rmarkdown.rstudio.com>。
- Chapter 2 Content:**
 - Text: When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:
 - R Code Chunk:

```
summary(cars)
```
 - Output:

```
##      speed      dist
##  Min.   : 4.0   Min.   : 2.00
##  1st Qu.:12.0   1st Qu.: 26.00
```
- Scatter Plot:**
 - Y-axis: pressure
 - X-axis: temperature
 - Plot shows a positive correlation between temperature and pressure.
- Note:** Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

A yellow callout bubble with the text '中文正常顯示' points to the title page.

4.R Markdown 使用

認識 Rmd 檔案

The image shows a screenshot of an R Markdown document editor with the 'Source' tab selected. The document content is as follows:

```

1 ---
2 title: "R big data"
3 author: "李明昌"
4 date: "2024-09-16"
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 syntax for authoring HTML, PDF, and
15 MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.
16 
17 When you click the Knit button a document will be generated that includes both content as well
18 as the output of any embedded R code chunks within the document. You can embed an R code chunk like
19 this:
20 
21 {r cars}
22 summary(cars)
23 
24 ## Including Plots
25 
```

Annotations and their corresponding parts in the document:

- 1**: Points to the header section (lines 1-6).
- 2**: Points to the R code chunk header and options (lines 8-9).
- 3**: Points to the section title (line 12).
- 4**: Points to the main text paragraph (lines 14-16).
- 5**: Points to the R code chunk body (lines 18-19).

Callout boxes provide additional information:

- Callout 1**: 1. r: 使用 R 語言
2. setup: Chunk 名稱
3. 參數設定: 程式碼與結果顯示設定
 - include = FALSE 不顯示程式碼及結果
 - echo = FALSE 不顯示程式碼，僅顯示結果
 - results = "hide" 顯示程式碼，不顯示結果
- Callout 3**: 章節名稱
- Callout 5**: Chunk 程式碼區塊，使用 `` 符號

R Markdown 參考資料

- R Markdown cheatsheet
 - <https://rstudio.github.io/cheatsheets/rmarkdown.pdf>
- R Markdown from Rstudio
 - <https://rmarkdown.rstudio.com/>
- Yihui Xie, J. J. Allaire, Garrett Grolemund, R Markdown: The Definitive Guide, 2023-12-30
 - <https://bookdown.org/yihui/rmarkdown/>
- Yihui Xie, Christophe Dervieux, Emily Riederer, R Markdown Cookbook, 2024-02-29
 - <https://bookdown.org/yihui/rmarkdown-cookbook/>

5. 結論

Rmarkdown → Quarto

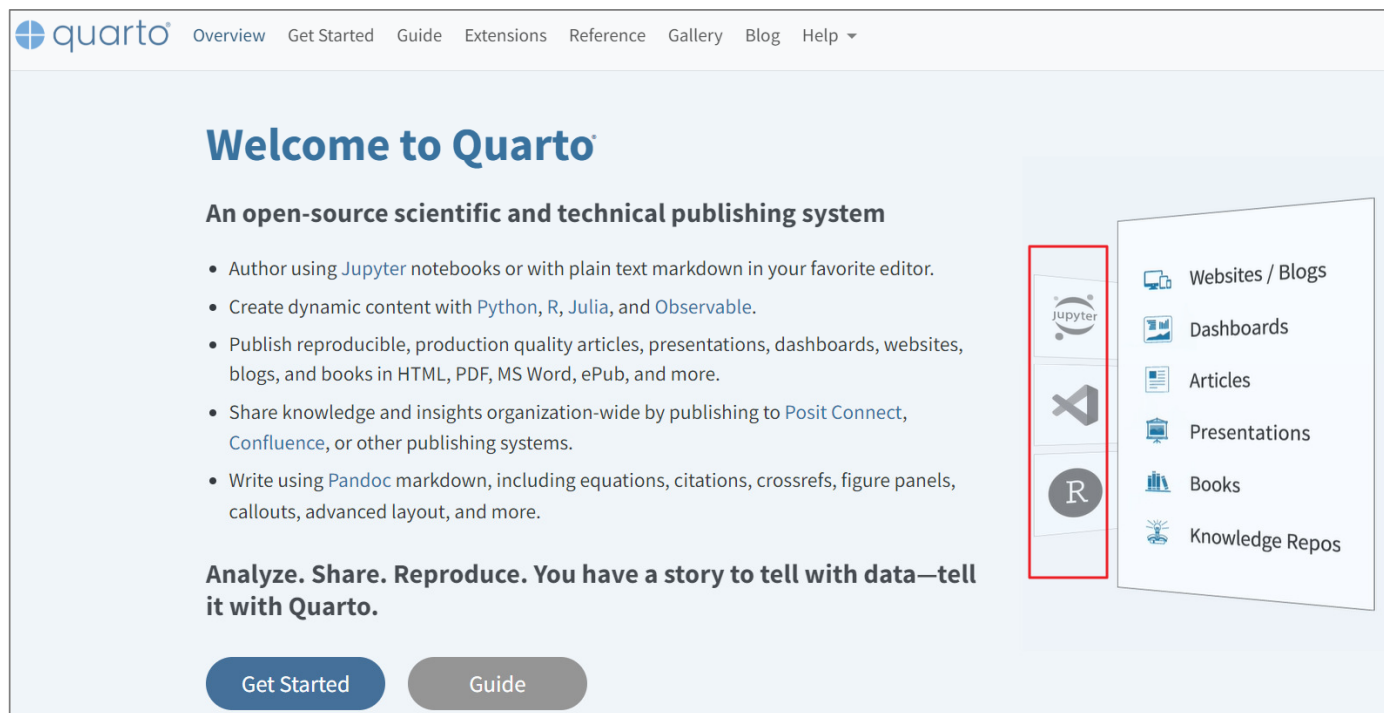


Quarto

- R Markdown 進階版
- 支援 R, Python, Julia, Observable JS

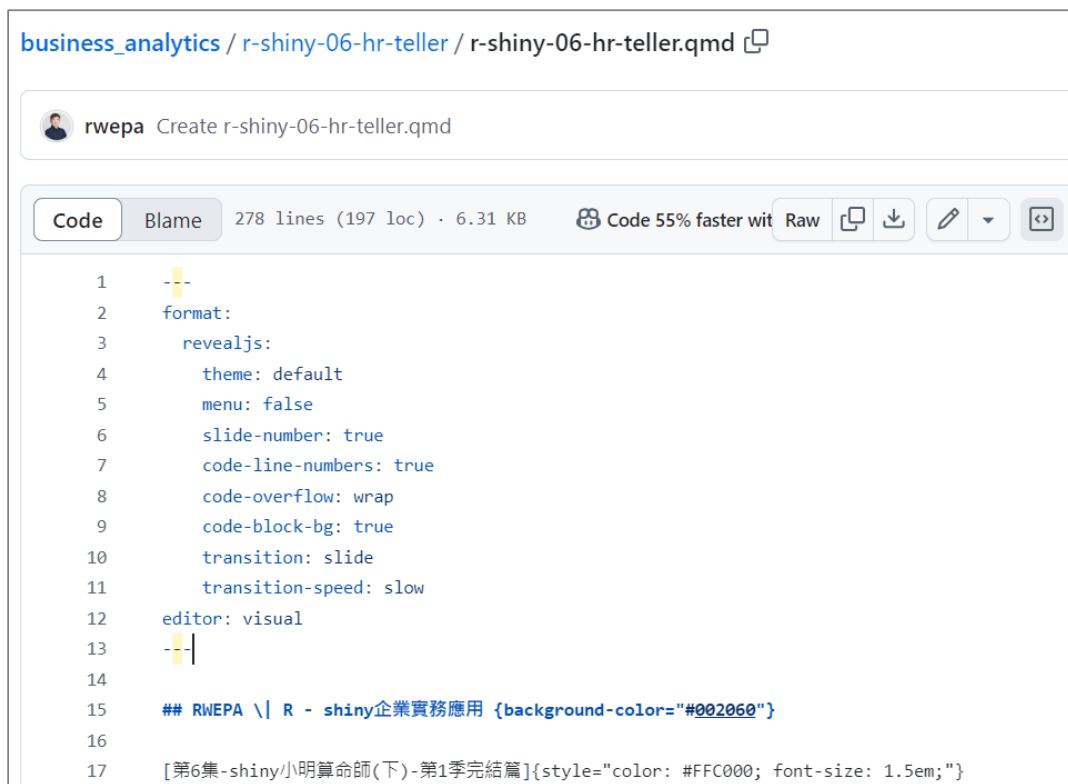
Quarto, Since 2022.8 (v1.0.38)

- Quarto: RMarkdown 的下一世代產品.
- 參考: <https://quarto.org/>



Quarto 應用

- RWEPA | shiny企業實務應用 第6集-小明算命師(下) 【附小明算命師實作成果、投影片與中文字幕】
- r-shiny-06-hr-teller.qmd
- https://github.com/rwepa/business_analytics/blob/main/r-shiny-06-hr-teller/r-shiny-06-hr-teller.qmd



```
business_analytics / r-shiny-06-hr-teller / r-shiny-06-hr-teller.qmd

rwepa Create r-shiny-06-hr-teller.qmd

Code Blame 278 lines (197 loc) · 6.31 KB Code 55% faster wit Raw [copy] [download] [edit] [view raw]

1  ---
2  format:
3    revealjs:
4      theme: default
5      menu: false
6      slide-number: true
7      code-line-numbers: true
8      code-overflow: wrap
9      code-block-bg: true
10     transition: slide
11     transition-speed: slow
12  editor: visual
13  ---
14
15  ## RWEPA \ | R - shiny企業實務應用 {background-color="#002060"}
16
17  [第6集-shiny小明算命師(下)-第1季完結篇]{style="color: #FFC000; font-size: 1.5em;"}
```

謝謝您的聆聽

Q & A



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<http://rwepa.blogspot.tw/>