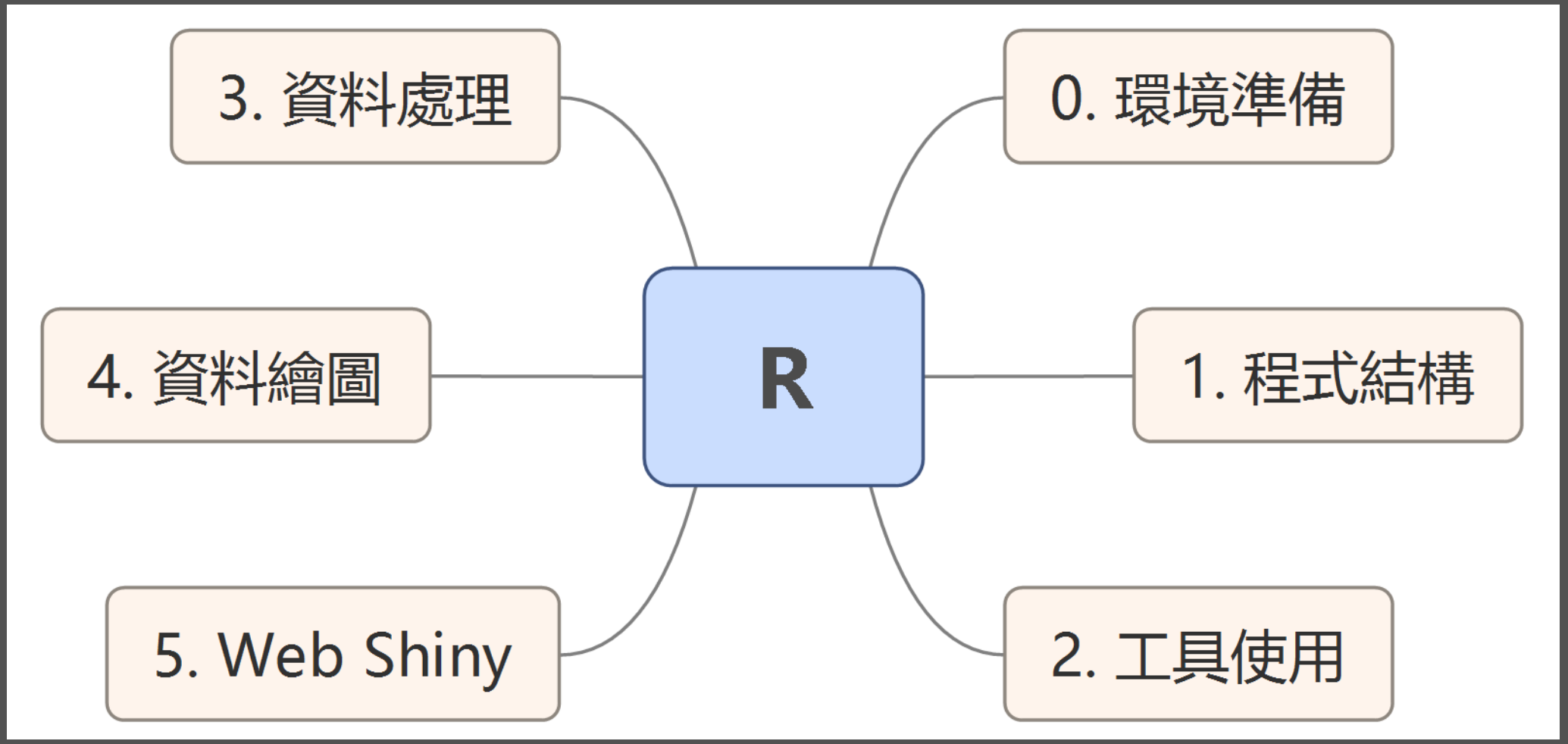
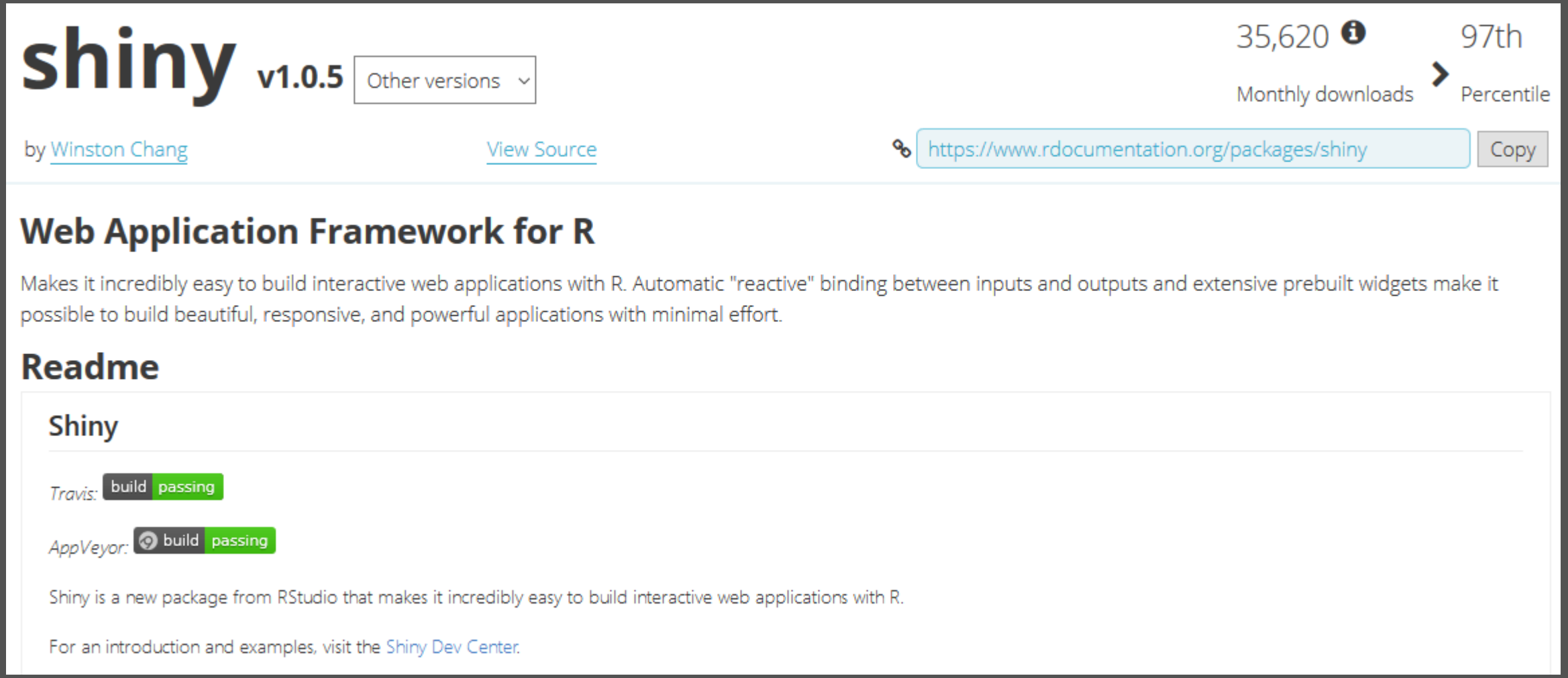
R Web Shiny

目的

在此講述 R Shiny 入門。



R Shiny packages



shiny v1.0.5 Other versions

35,620 Monthly downloads

97th Percentile

by Winston Chang View Source https://www.rdocumentation.org/packages/shiny Copy

Web Application Framework for R

Makes it incredibly easy to build interactive web applications with R. Automatic "reactive" binding between inputs and outputs and extensive prebuilt widgets make it possible to build beautiful, responsive, and powerful applications with minimal effort.

Readme

Shiny

Travis: build passing

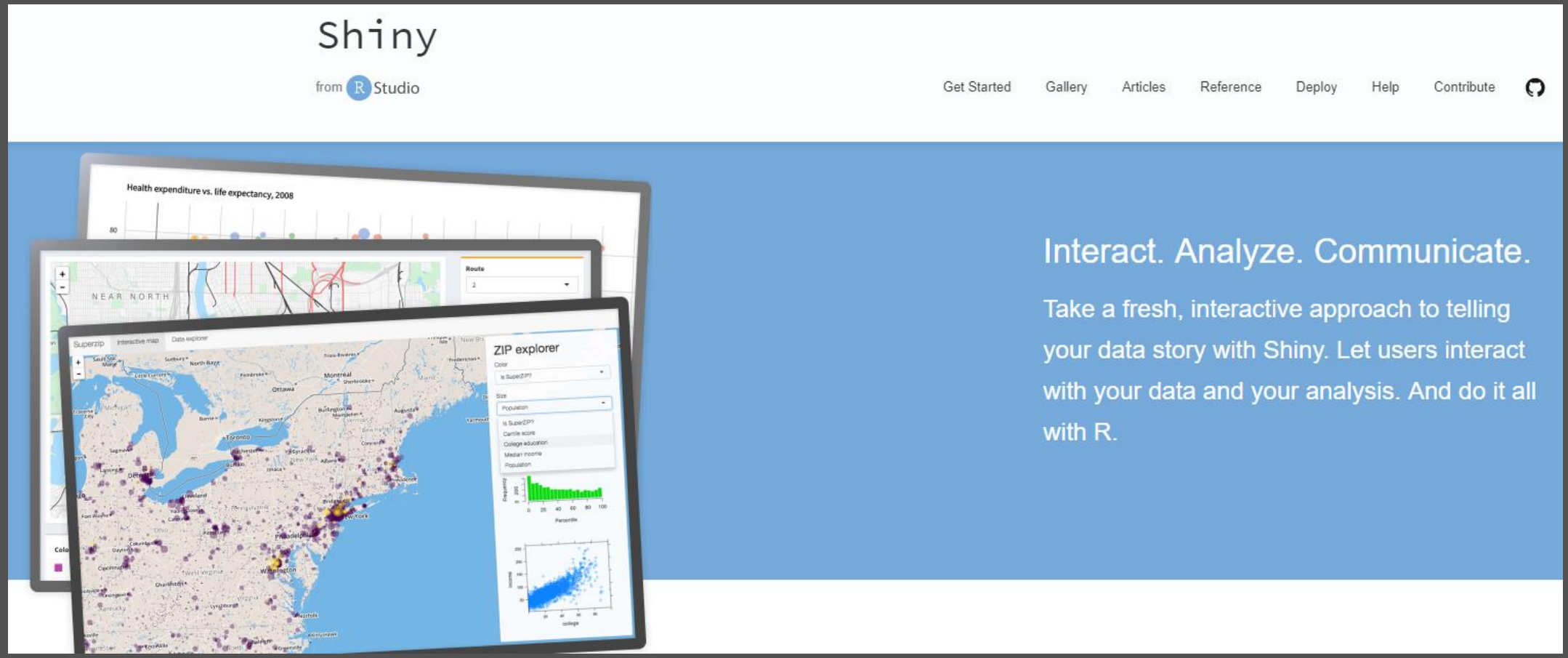
AppVeyor: build passing

Shiny is a new package from RStudio that makes it incredibly easy to build interactive web applications with R.

For an introduction and examples, visit the Shiny Dev Center.

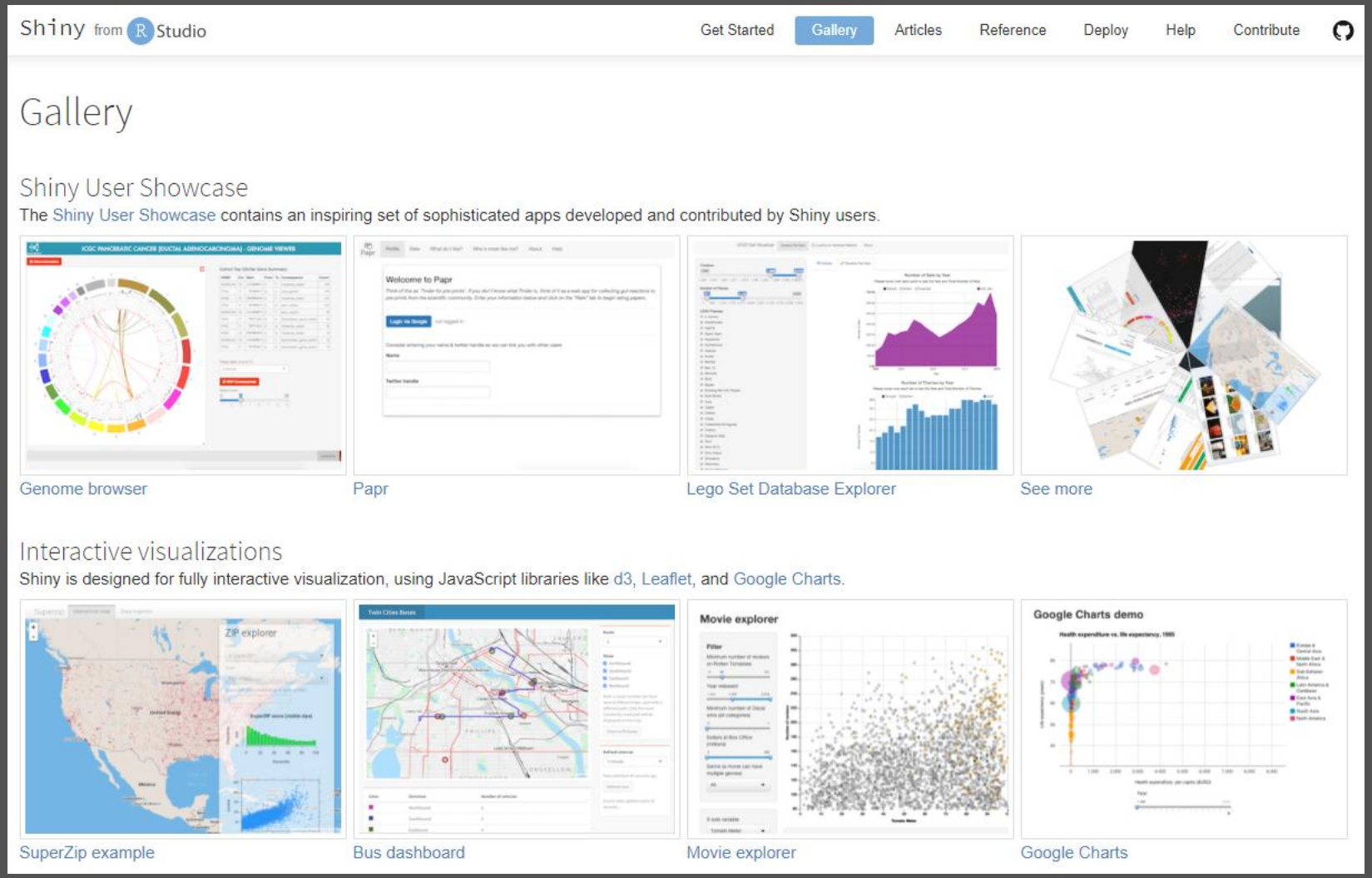
R Shiny

https://shiny.rstudio.com/



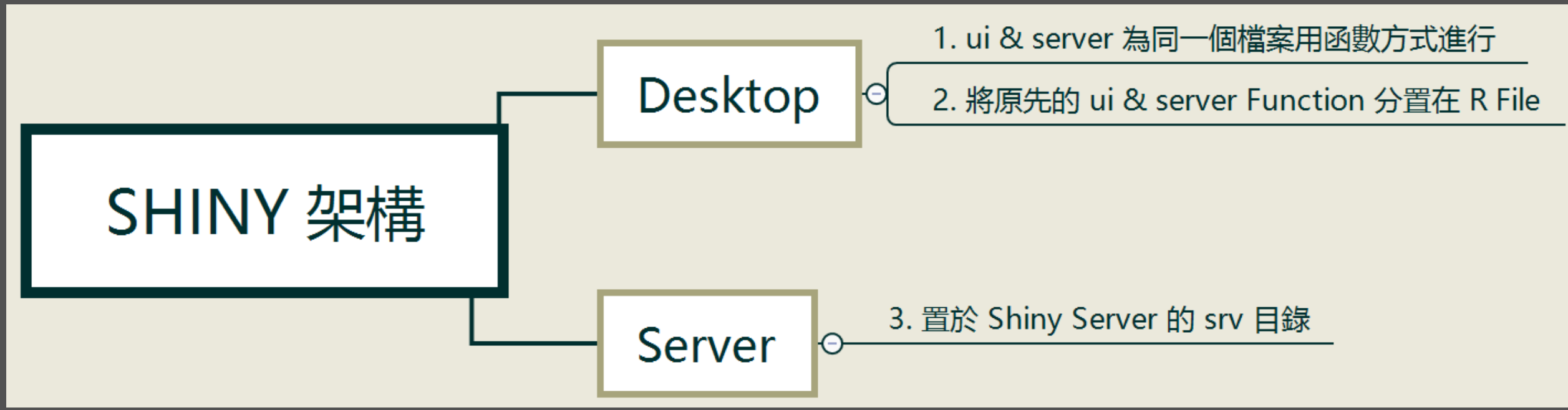
R Shiny Gallery 官網範例

https://shiny.rstudio.com/gallery/



R Shiny 架構

1. ui & server 為同一個檔案用函數方式進行
2. 將原先的 ui & server Function 分置在 R File
3. 置於 Shiny Server 的 srv 目錄



R Shiny 架構

1. ui & server 為同一個檔案用函數方式進行

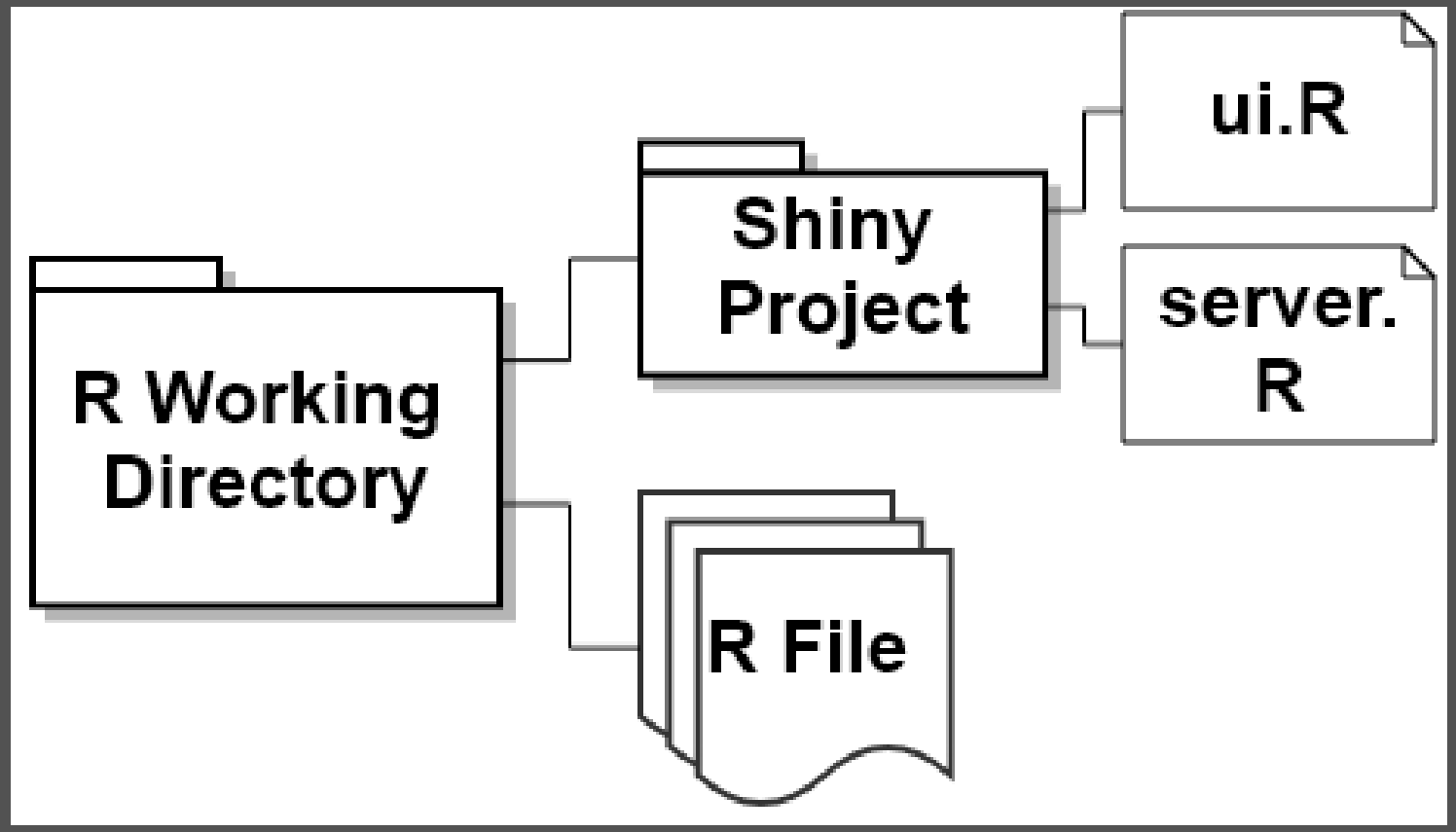
```
ui = shinyUI(fluidPage(
  ...
))

server = function(input, output) {
  ...
}

shinyApp( ui = ui, server = server)
```


```
ui = shinyUI(fluidPage(
        ...
))

server = function(input, output) {
        ...
}

shinyApp( ui = ui, server = server)
```

R Shiny 架構

2. 將原先的 ui & server Function 分置在 R File

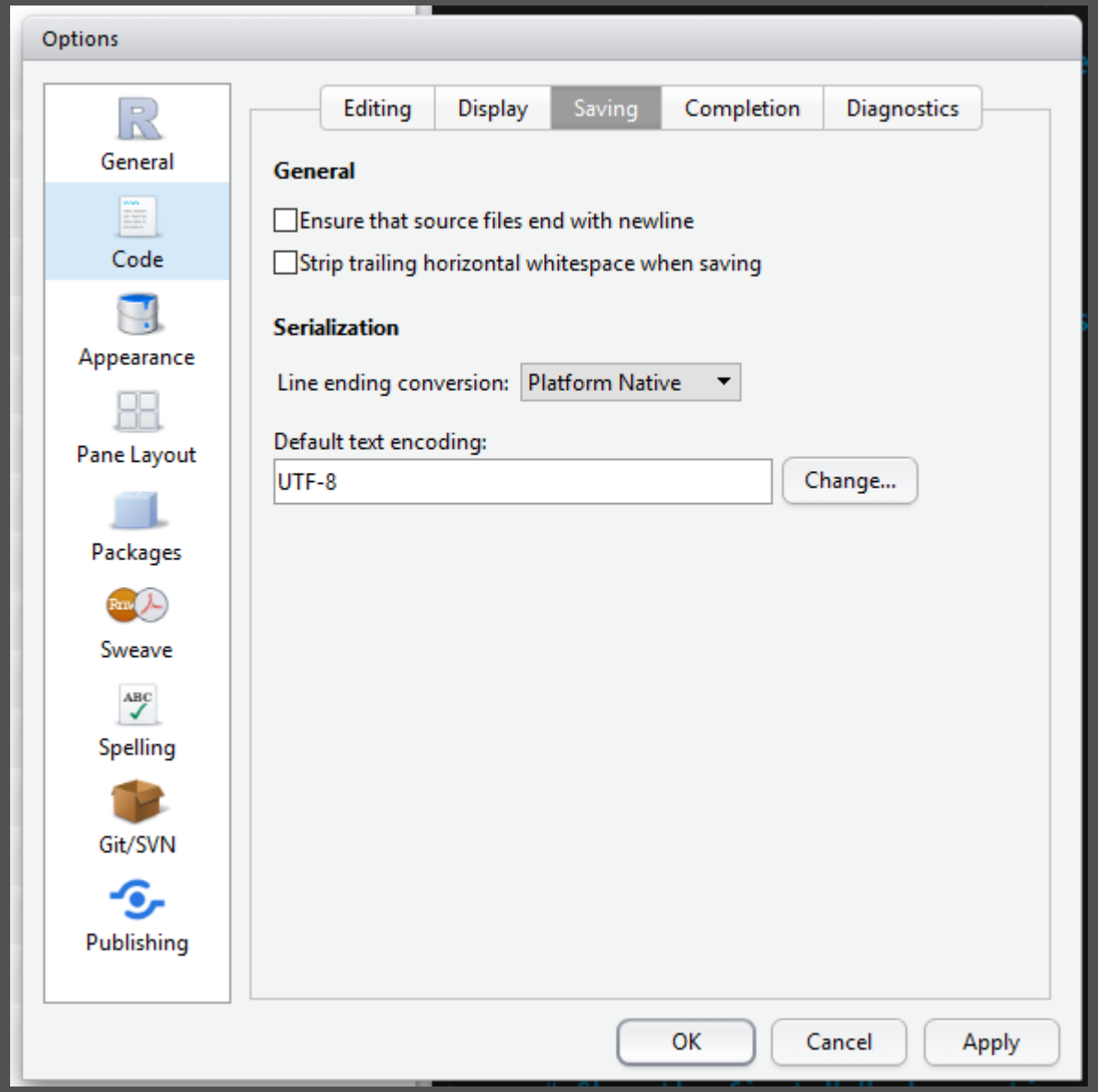
```
setwd("[指定目錄]")
getwd()
library(shiny)
runApp("[Shiny 專案的目錄名稱]")
```



R Shiny 架構

3. 置於 Shiny Server 的 srv 目錄

這裡要注意的一件事情，如果是 Windows 與 Linux 一起使用的開發者，要注意這兩者的編碼問題， Windows 的編碼是 Big5，Linux 為 UTF-8，如果習慣在 Windows 上進行編寫，到了完成才會正式放上 Linux 環境的 R Shiny Server 的人，建議用 RStudio IDE 工具將預設編碼一開始就設為 UTF-8。



R Shiny Hello, World!

server.R (後端)
使用 iris 與 ggplot2 套件下的 diamonds資料。

C05 - haoyehowld

server.R - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

```
library(shiny)
library(ggplot2)

function(input, output) {

  datasetInput <- reactive({
    switch(input$dataset,
                "iris" = iris,
                "dimd" = diamonds)
  })

  output$summary <- renderPrint({
    dataset = datasetInput()
    summary(dataset)
  })

  # Show the first "n" observations
  output$view <- renderTable({
    head(datasetInput(), n = input$obs)
  })
}
```

R Shiny Hello, World!

ui.R (前端)

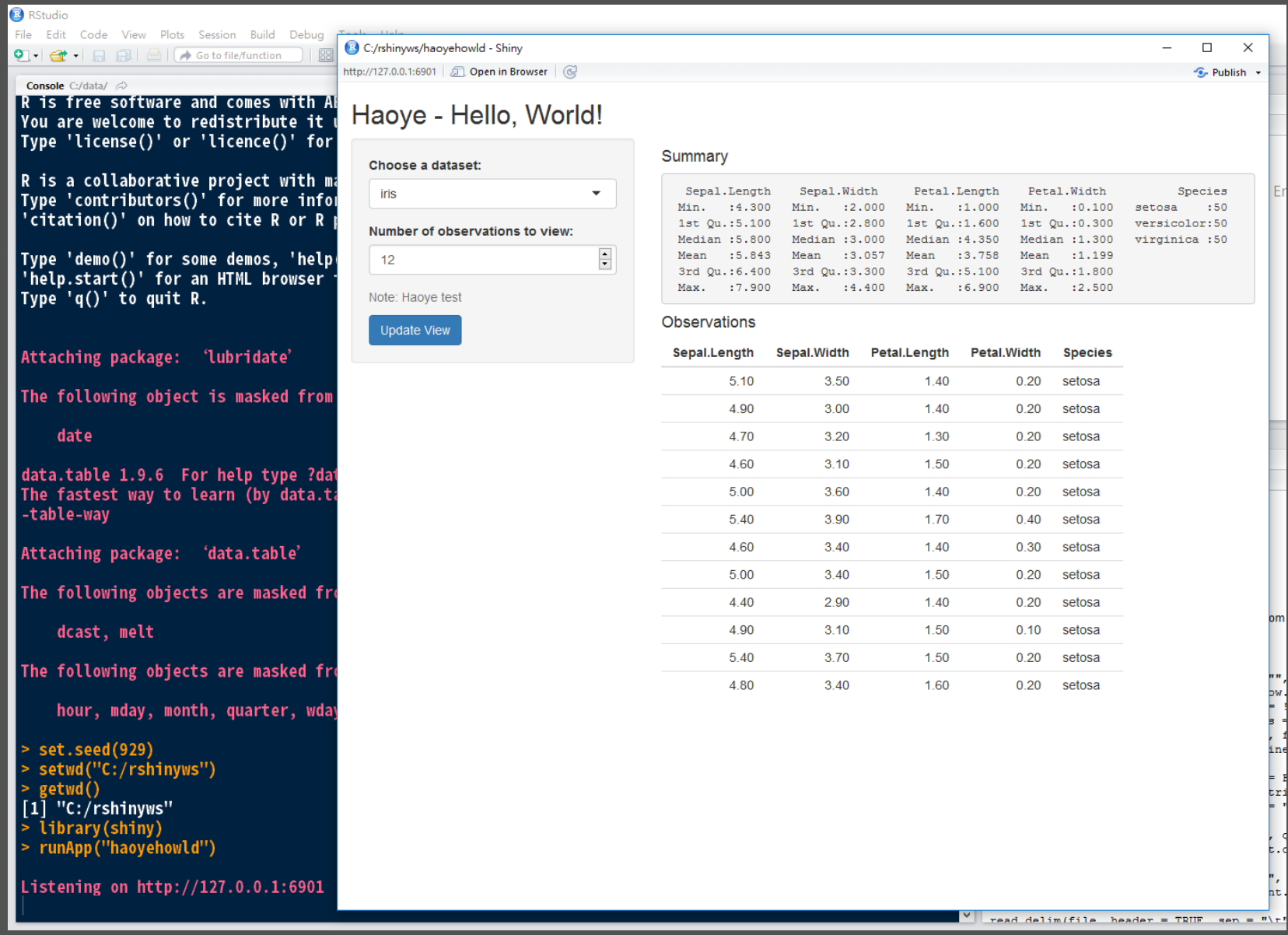
ui.r - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

```
library(shiny)
library(ggplot2)

fluidPage(

 titlePanel("Haoye - Hello, World!"),

 sidebarLayout(
  sidebarPanel(
   selectInput("dataset", "Choose a dataset:",
               choices = c( "iris", "dimd")),

   numericInput("obs", "Number of observations to view:", 10),

   helpText("Note: Haoye test"),

   submitButton("Update View")
  ),

  mainPanel(
   h4("Summary"),
   verbatimTextOutput("summary"),

   h4("Observations"),
   tableOutput("view")
  )
 )
)
```

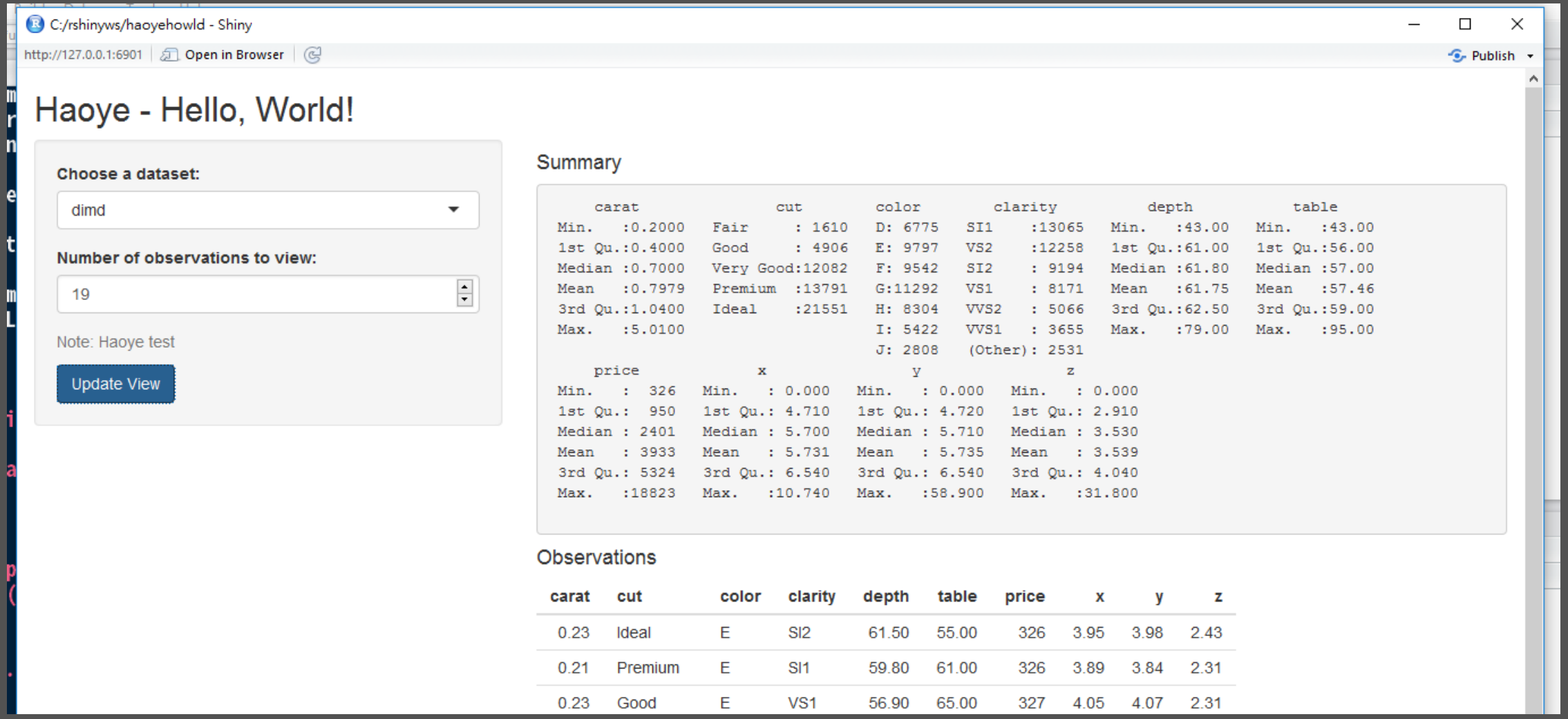
R Shiny Hello, World!

可以檢視 iris 的資料與欄位



R Shiny Hello, World!

切換至 dimd 也能看到 ggplot2
套件下的 diamonds 資料



R Shiny - reactiveValues

一開始接觸 Shiny 的人，除了建議參考官方給予的範例進行做中學之外，還有一個地方必須注意，在 R 本身處理跟 Shiny 有些地方的處理不太一樣。

例如平常使用 R Function 進行分析，在複雜的工作下，有時候會選擇利用 assign() 建立物件賦值，然後把待分析或者暫存的資料塞進去，但是在 R Shiny 的世界中，如果是用這種方式建立物件，並用該物件暫時存放待處理的資料則會有很大的問題，尤其是在 assign() 根據其參數 env = .GlobalEnv 所建立的物件在 R 的世界中為全域變數，這個東西在 Shiny 運作時非常麻煩，你會看到用這類方式所建立的物件，Shiny 根本無法改變它。

所以這個時候會建議使用 reactiveValues() 這個方式進行建立暫存，所建立的物件在使用上會跟 List 類似。

R Shiny - reactiveValues

步驟

1. 假設在 server.R 建立一個名為 tmsp 的 reactiveValues() 物件。
tmsp = reactiveValues()

2. 之後要存放資料則可以用此方式指定
tmsp$values1 = c(1, 2, 3, 4, 5)

3. 當然也可以放從 ui.R input 進來的資料
tmsp$values2 = input$values3

4. 從 server.R 輸出則可以用這種方式
output$summary = renderPrint({
  summary(tmsp$values1)
})

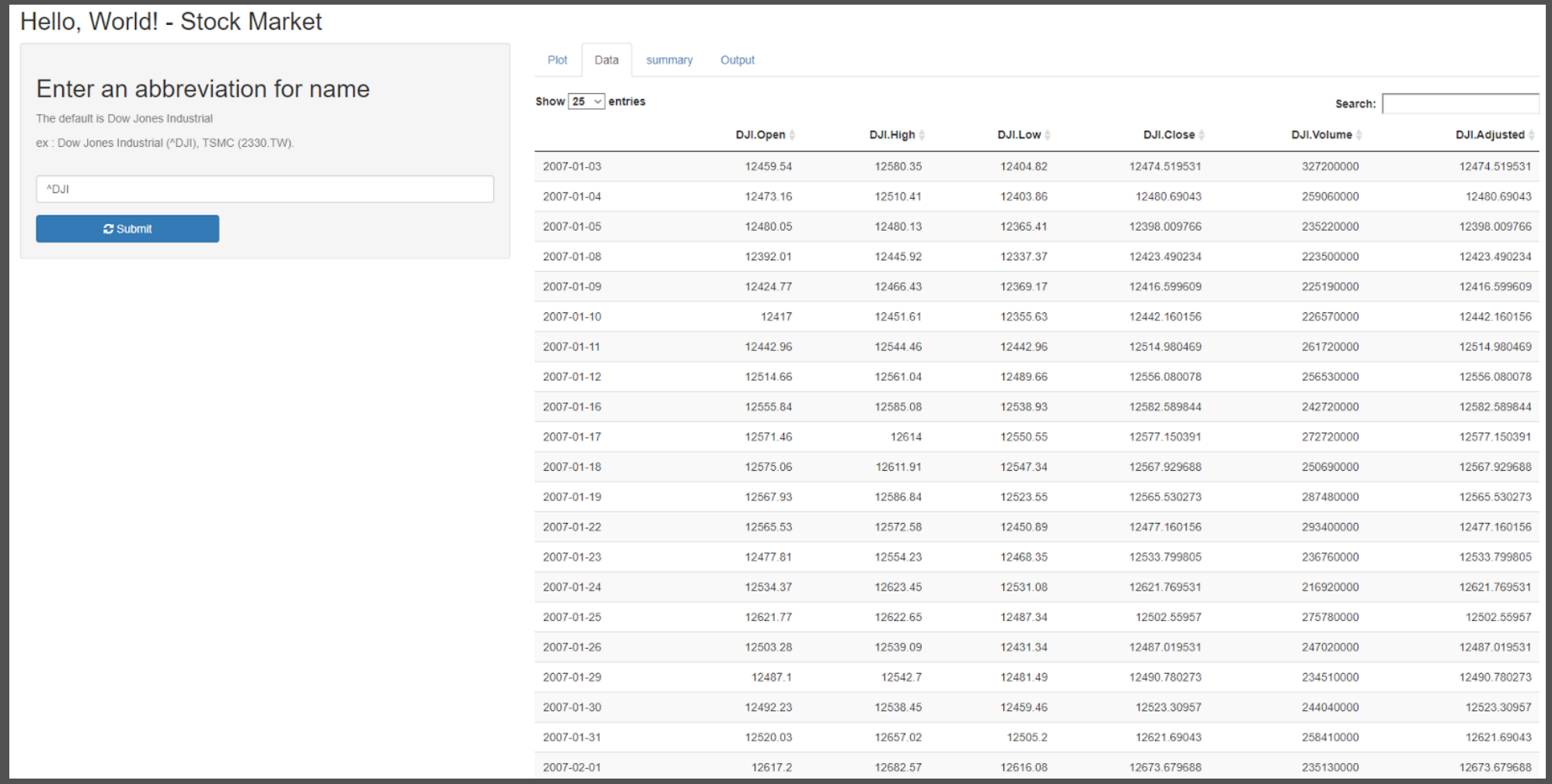
```
ui = shinyUI(fluidPage(
  textInput("values3", "", value = "Text" )
 ...
  verbatimTextOutput("summary")
 ...
))

server = function(input, output) {
 ...
 tmsp = reactiveValues()
 ...
 tmsp$values1 = c( 1, 2, 3, 4, 5)
 ...
 tmsp$values2 =  input$values3
 ...
 output$summary = renderPrint({
  summary(tmsp$values1)
 })
}

shinyApp( ui = ui, server = server)
```

R Shiny 股市資料 - quantmod

C05 - smhwR
在此可以輸入公司的縮寫，而縮寫名稱則根據 Yahoo Finance 的別名。輸入縮寫後則可顯示 2007 - 2017 年間的資料。

R Shiny 股市資料 - quantmod

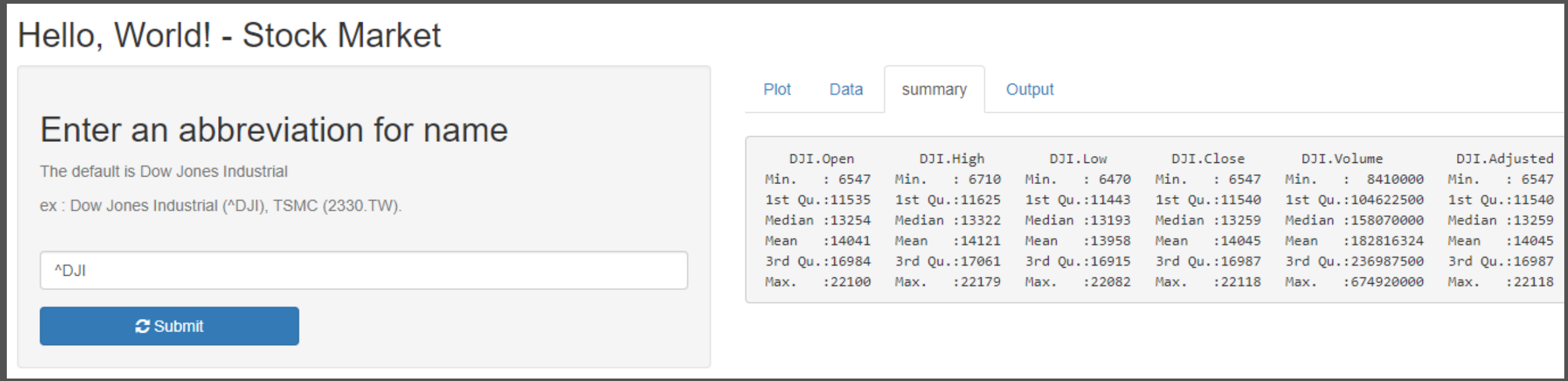
C05 - smhwR
Data 頁面則是呈現每筆資料的細節。



	DJI.Open	DJI.High	DJI.Low	DJI.Close	DJI.Volume	DJI.Adjusted
2007-01-03	12459.54	12580.35	12404.82	12474.519531	327200000	12474.519531
2007-01-04	12473.16	12510.41	12403.86	12480.69043	259060000	12480.69043
2007-01-05	12480.05	12480.13	12365.41	12398.009766	235220000	12398.009766
2007-01-08	12392.01	12445.92	12337.37	12423.490234	223500000	12423.490234
2007-01-09	12424.77	12466.43	12369.17	12416.599609	225190000	12416.599609
2007-01-10	12417	12451.61	12355.63	12442.160156	226570000	12442.160156
2007-01-11	12442.96	12544.46	12442.96	12514.980469	261720000	12514.980469
2007-01-12	12514.66	12561.04	12489.66	12556.080078	256530000	12556.080078
2007-01-16	12555.84	12585.08	12538.93	12582.589844	242720000	12582.589844
2007-01-17	12571.46	12614	12550.55	12577.150391	272720000	12577.150391
2007-01-18	12575.06	12611.91	12547.34	12567.929688	250690000	12567.929688
2007-01-19	12567.93	12586.84	12523.55	12565.530273	287480000	12565.530273
2007-01-22	12565.53	12572.58	12450.89	12477.160156	293400000	12477.160156
2007-01-23	12477.81	12554.23	12468.35	12533.799805	236760000	12533.799805
2007-01-24	12534.37	12623.45	12531.08	12621.769531	216920000	12621.769531
2007-01-25	12621.77	12622.65	12487.34	12502.55957	275780000	12502.55957
2007-01-26	12503.28	12539.09	12431.34	12487.019531	247020000	12487.019531
2007-01-29	12487.1	12542.7	12481.49	12490.780273	234510000	12490.780273
2007-01-30	12492.23	12538.45	12459.46	12523.30957	244040000	12523.30957
2007-01-31	12520.03	12657.02	12505.2	12621.69043	258410000	12621.69043
2007-02-01	12617.2	12682.57	12616.08	12673.679688	235130000	12673.679688

R Shiny 股市資料 - quantmod

C05 - smhwR
進行單純的敘述統計。



R Shiny 股市資料 - quantmod

C05 - smhwR

該頁可以匯出 CSV 檔案，預設資料格式編碼則為 UTF-8 。

Hello, World! - Stock Market

Enter an abbreviation for name

The default is Dow Jones Industrial

ex : Dow Jones Industrial (^DJI), TSMC (2330.TW).

^DJI

Submit

Plot | Data | summary | Output

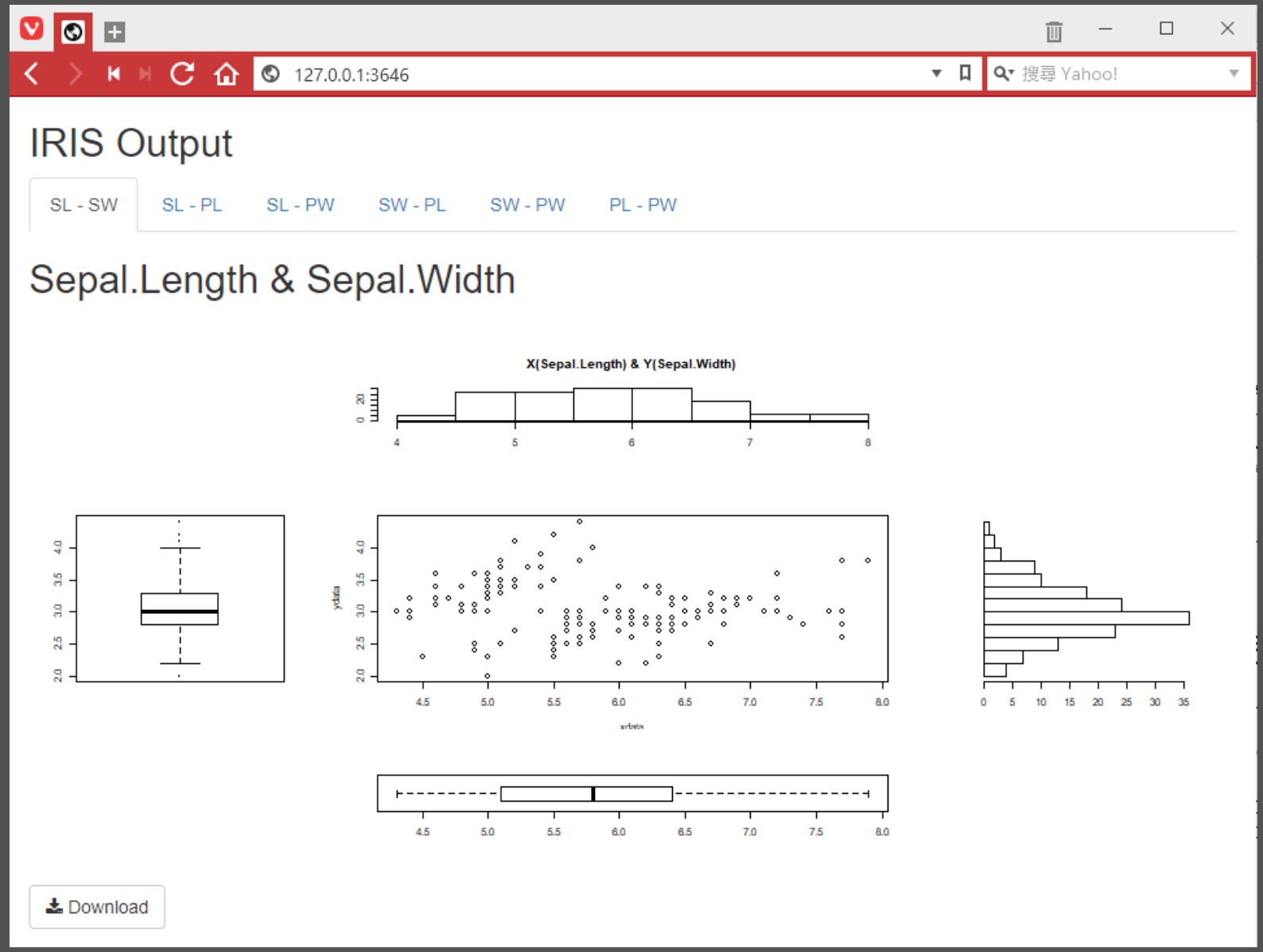
Download

sm_20170816023508.csv - LibreOffice Calc

	A	B	C	D	E	F
1	DJI.Open	DJI.High	DJI.Low	DJI.Close	DJI.Volume	DJI.Adjusted
2	12459.54	12580.35	12404.82	12474.519531	327200000	12474.5195
3	12473.16	12510.41	12403.86	12480.69043	259060000	12480.6904
4	12480.05	12480.13	12365.41	12398.009766	235220000	12398.0098
5	12392.01	12445.92	12337.37	12423.490234	223500000	12423.4902
6	12424.77	12466.43	12369.17	12416.599609	225190000	12416.5996
7	12417	12451.61	12355.63	12442.160156	226570000	12442.1602
8	12442.96	12544.46	12442.96	12514.980469	261720000	12514.9805
9	12514.66	12561.04	12489.66	12556.080078	256530000	12556.0801
10	12555.84	12585.08	12538.93	12582.589844	242720000	12582.5898
11	12571.46	12614	12550.55	12577.150391	272720000	12577.1504
12	12575.06	12611.91	12547.34	12567.929688	250690000	12567.9297
13	12567.93	12586.84	12523.55	12565.530273	287480000	12565.5303
14	12565.53	12572.58	12450.89	12477.160156	293400000	12477.1602
15	12477.81	12554.23	12468.35	12533.799805	236760000	12533.7998
16	12534.37	12623.45	12531.08	12621.769531	216920000	12621.7695
17	12621.77	12622.65	12487.34	12502.55957	275780000	12502.5596

R Shiny 視覺化匯出 PNG

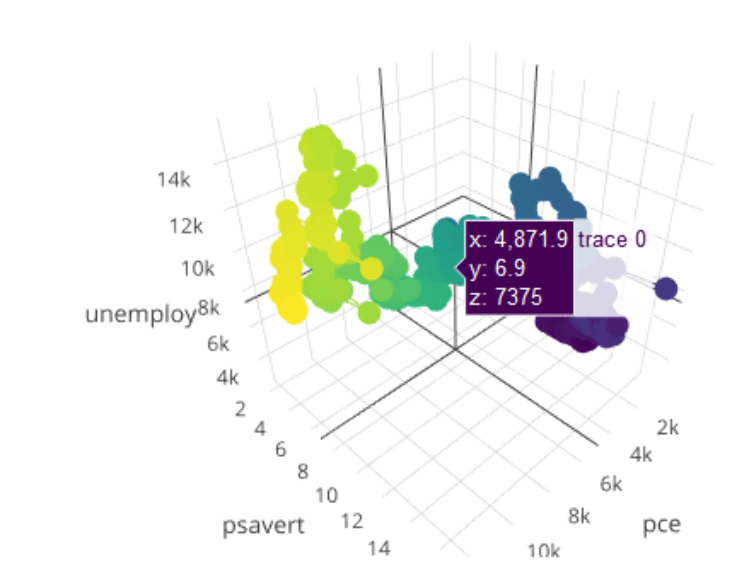
C05 - dlplot
該頁可以匯出 PNG 檔案。



R Shiny 視覺化 - plotly

C05 – plotly.R

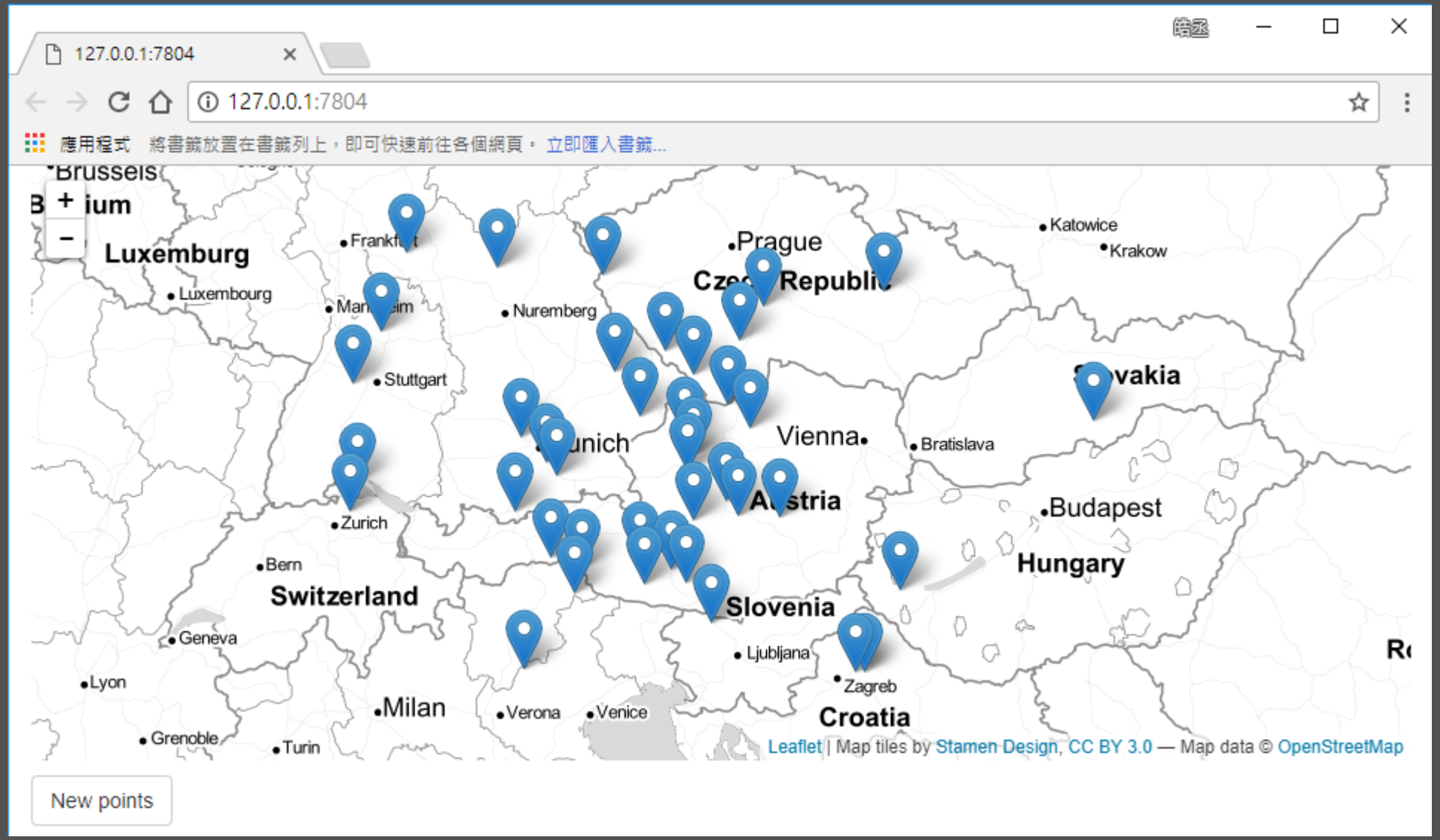
動態視覺化



R Shiny地圖視覺化 - leaflet

C05 – leaflet.R

地圖視覺化



R Shiny Server 架設流程

C05 – RSSer