Shiny의 또 다른 활용

RStudio Addin 함수 및 패키지의 제작

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패키지 설치

이번 강의를 위해 다음 패키지의 설치가 필요하다.

- install.packages(c("miniUI","dplyrAssist","editData","ggplotAssist","nycflights13"))
- install.packages("rstudioapi", type = "source")
- devtools::install_github("rstudio/addinexamples", type = "source")

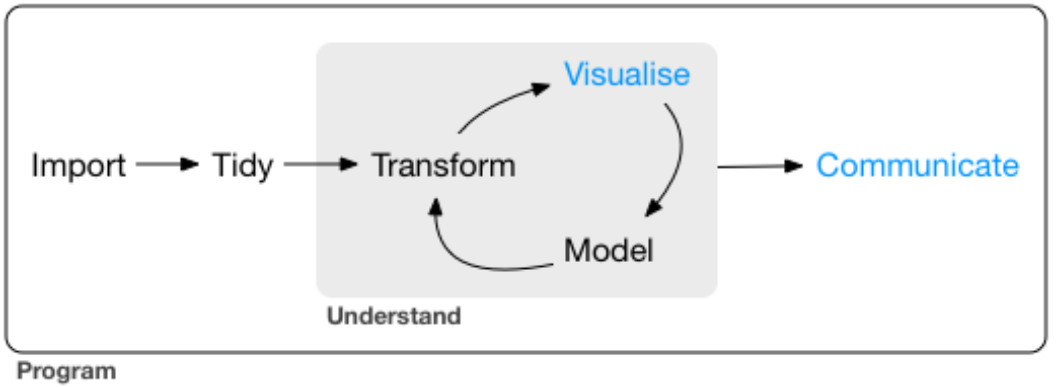
예제 소스 파일

이번 강의에 사용되는 예제 소스 파일들은 다음 github에서 다운로드 받을수 있다.

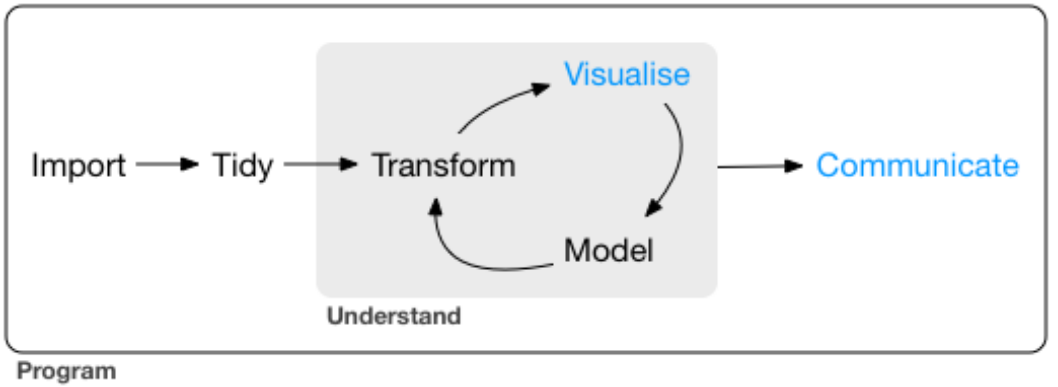
https://github.com/cardiomoon/shinyLecture2

- ggbrush.R
- pick_points.R
- tower_of_hanoi.R

Typical Data Science Project



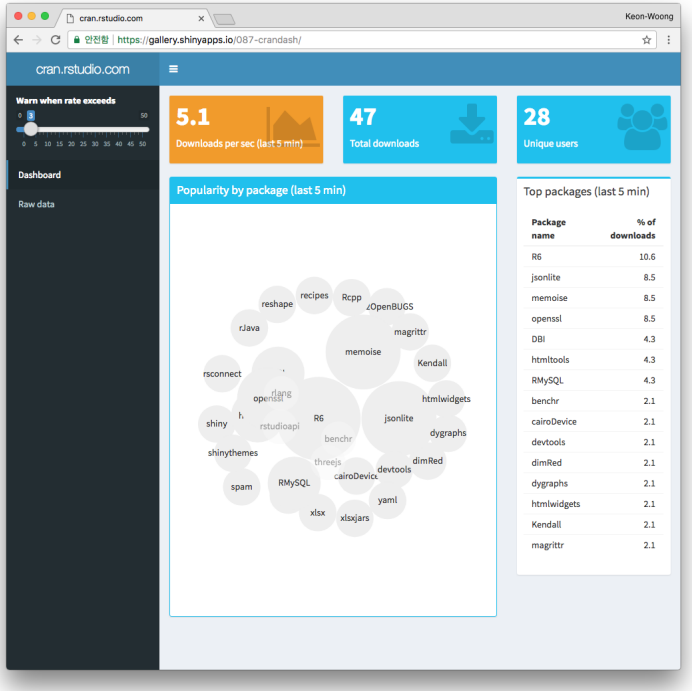
Typical Data Science Project



Shiny

A medium for interactively communicating *ideas* and *results*

A shiny app



https://gallery.shinyapps.io/087-crandash/

Shiny Applications

- 나의 데이터, 분석 결과, 모형 등을
- 다른 사람들 특히 R을 잘 모르는 사람들과 communication하기 위해 제작
- 주로 분석의 결과를 나타냄
- Server(Shiny server, ShinyApps.io)에 위치하여 웹 browser를 통해 접근

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Shiny Gadgets

- R programming 을 도와주기 위한 interactive tool
- R을 모르는 end user가 아닌 R 을 사용하는 user가 사용하도록 제작
- 분석의 결과가 아니라 분석의 과정 중에 사용
- R console이나 R code로 불러오거나 RStudio 내에서 사용
- RStudio Addins 중 하나로 등록하여 GUI 환경에서 사용할 수 있다.

Potential Use of Shiny Gadgets

데이터 로딩, 데이터 정제, 데이터 조작, 데이터 시각화 등 거의 모든 업무에 대해 shiny gadget을 만들 수 있다.

- 복잡한 API를 통해 데이터을 다운로드하는 과정을 easy-to-use UI로 만듬
- 정규표현식을 이용한 검색/치환 등을 미리보기
- Visual Selection tools for subsetting or outlier exclusion

Shiny Gadgets by 문건웅

Install from CRAN

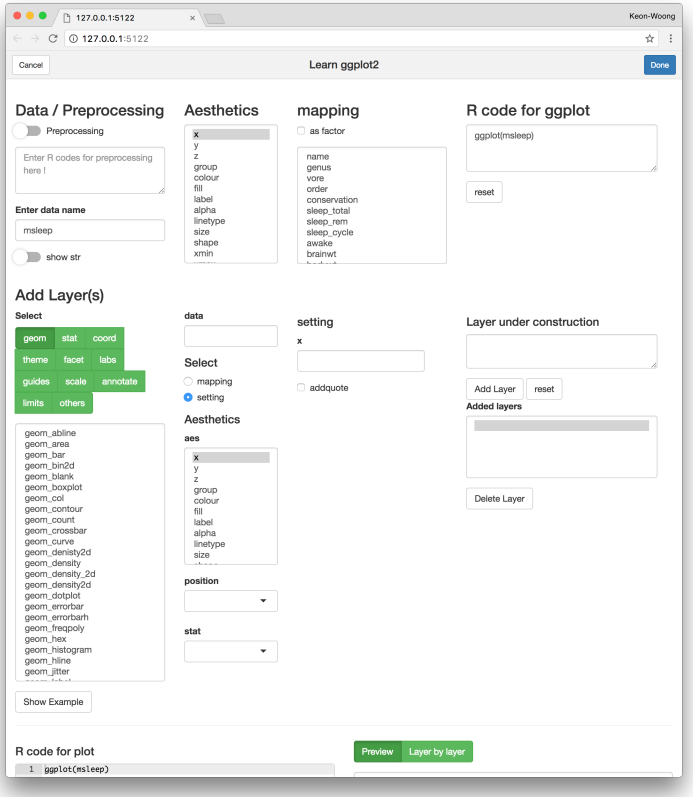
```
install.packages("dplyrAssist")
install.packages("editData")
install.packages("ggplotAssist")
```

Install from github

```
require(devtools)
install_github("cardiomoon/dplyrAssist")
install_github("cardiomoon/editData")
install_github("cardiomoon/ggplotAssist")
```

A Shiny Gadget - ggplotAssist

```
devtools::install_github("cardiomoon/ggplotAssist")
```



Writing Shiny Gadgets ... regular function

```
library(shiny)
library(miniUI)

myGadgetFunc <- function(inputValue1, inputValue2) {

  ui <- miniPage(
    gadgetTitleBar("My Gadget"),
    miniContentPanel(
      # Define layout, inputs, outputs
    )
  )

  server <- function(input, output, session) {
    # Define reactive expressions, outputs, etc.

    # When the Done button is clicked, return a value
    observeEvent(input$done, {
      returnValue <- ...
      stopApp(returnValue)
    })
  }

  runGadget(ui, server)
```

UI

```
ui <- miniPage(
   gadgetTitleBar("My Gadget"),
   miniContentPanel(
     # Define layout, inputs, outputs
   )
 )
```

UI

```
ui <- miniPage(
   gadgetTitleBar("My Gadget"),
   miniContentPanel(
     # Define layout, inputs, outputs
   )
 )
```

- Shiny Apps: fluidPage, sidebarLayout
- Shiny Gadgets: miniPage, miniContentPanel
- Shiny Gadget은 default로 RStudio의 Viewer pane에서 수행된다.
- Web browser보다 훨씬 적은 공간이므로 공간을 절약할 수 있는 miniUI 패키지를 사용

Server

```
server <- function(input, output, session) {
   # Define reactive expressions, outputs, etc.

   # When the Done button is clicked, return a value
   observeEvent(input$done, {
     returnValue <- ...
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   })
}

runGadget(ui, server)
```

Server

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   # Define reactive expressions, outputs, etc.

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     returnValue <- ...
     stopApp(returnValue)
   })
}

runGadget(ui, server)
```

- UI의 gadgetTitleBar("My Gadget")에서 Cancel과 Done 버튼을 제공한다.
- Done 버튼은 위와 같이 다룬다.
- Cancel 버튼을 누르면 runGadget()함수에서 자동으로 "User Cancel" 에러와 함께 앱을 종료해준다.

Cancel 버튼 이벤트 다루기

```
server <- function(input, output, session) {

   observeEvent(input$cancel, {
      stopApp(NULL)
   })

}

runGadget(ui, server,stopOnCancel = FALSE)
```

The First Shiny Gadget - ggbrush.R

```
library(shiny)
library(miniUI)
library(ggplot2)

ggbrush <- function(data, xvar, yvar) {

  ui <- miniPage(
    gadgetTitleBar("Drag to select points"),
    miniContentPanel(
      plotOutput("plot", height = "100%", brush = "brush")
    )
  )

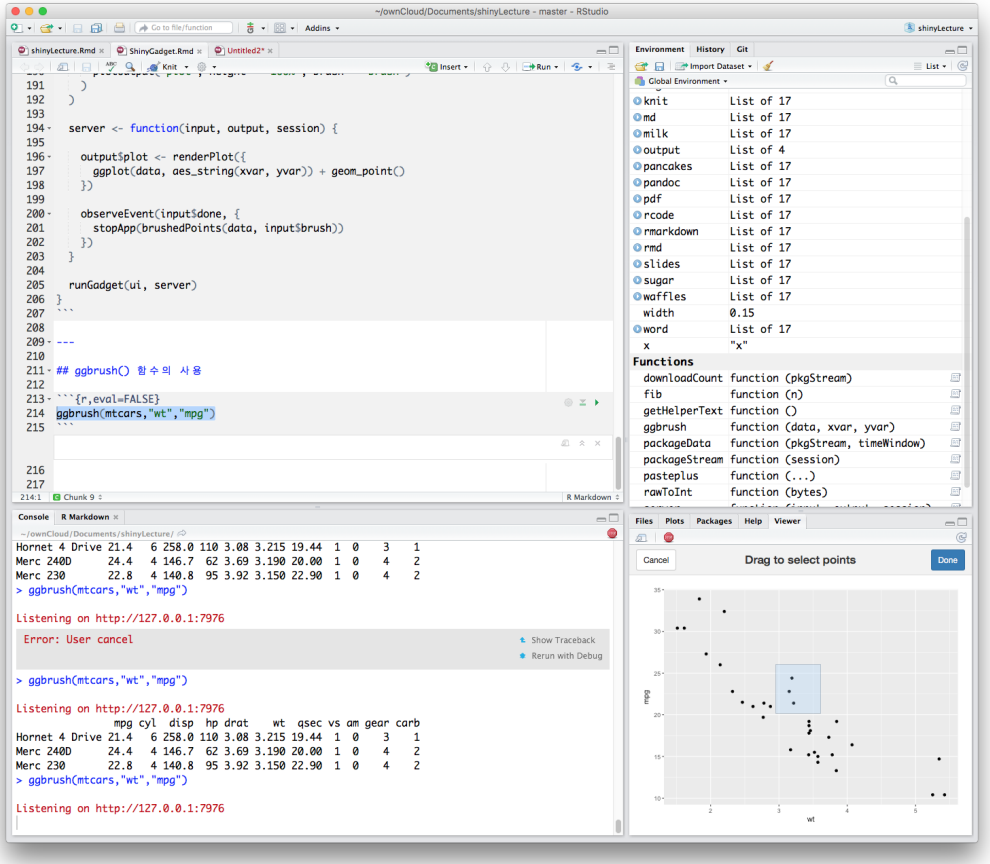
  server <- function(input, output, session) {

    output$plot <- renderPlot({
      ggplot(data, aes_string(xvar, yvar)) + geom_point()
    })

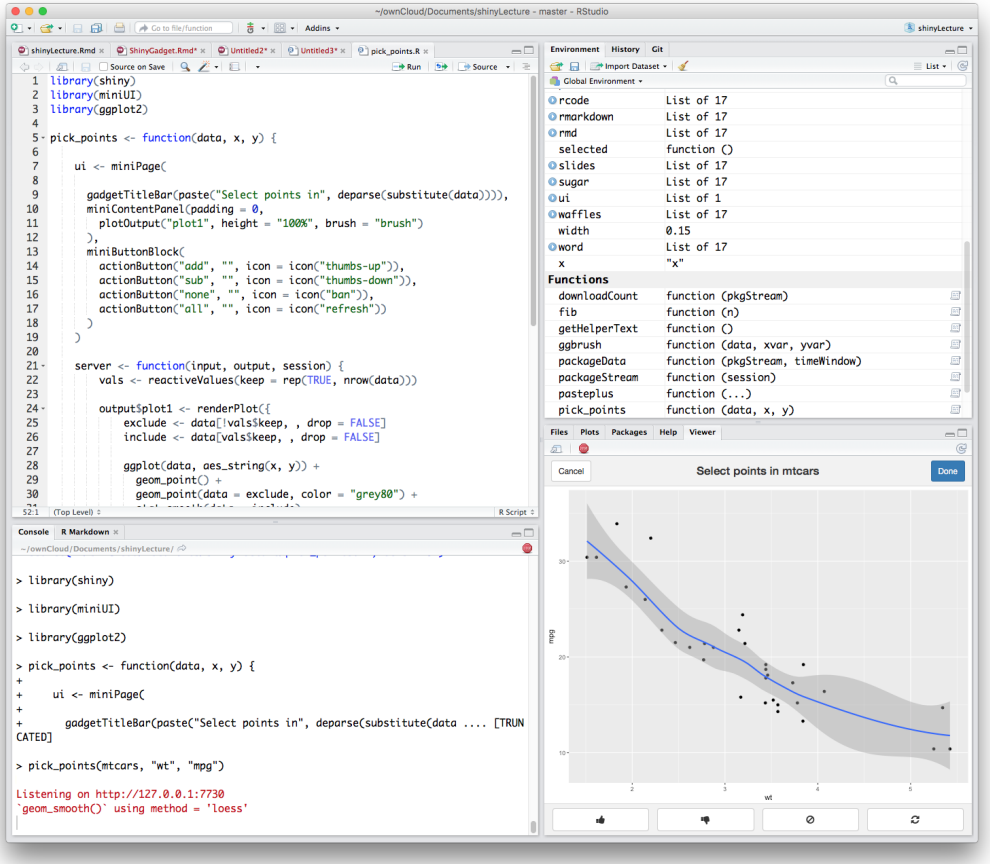
    observeEvent(input$done, {
      stopApp(brushedPoints(data, input$brush))
    })
  }
```

ggbrush() 함수의 사용

```
ggbrush(mtcars,"wt","mpg")
```



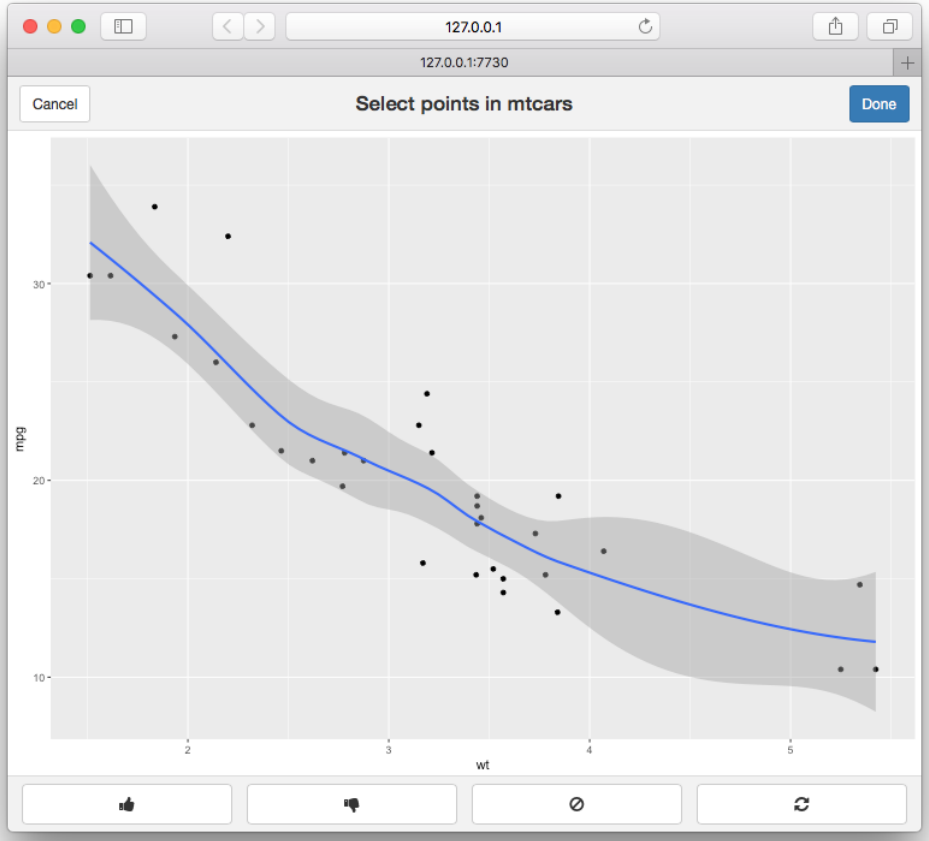
The 2nd Example - pick_points.R

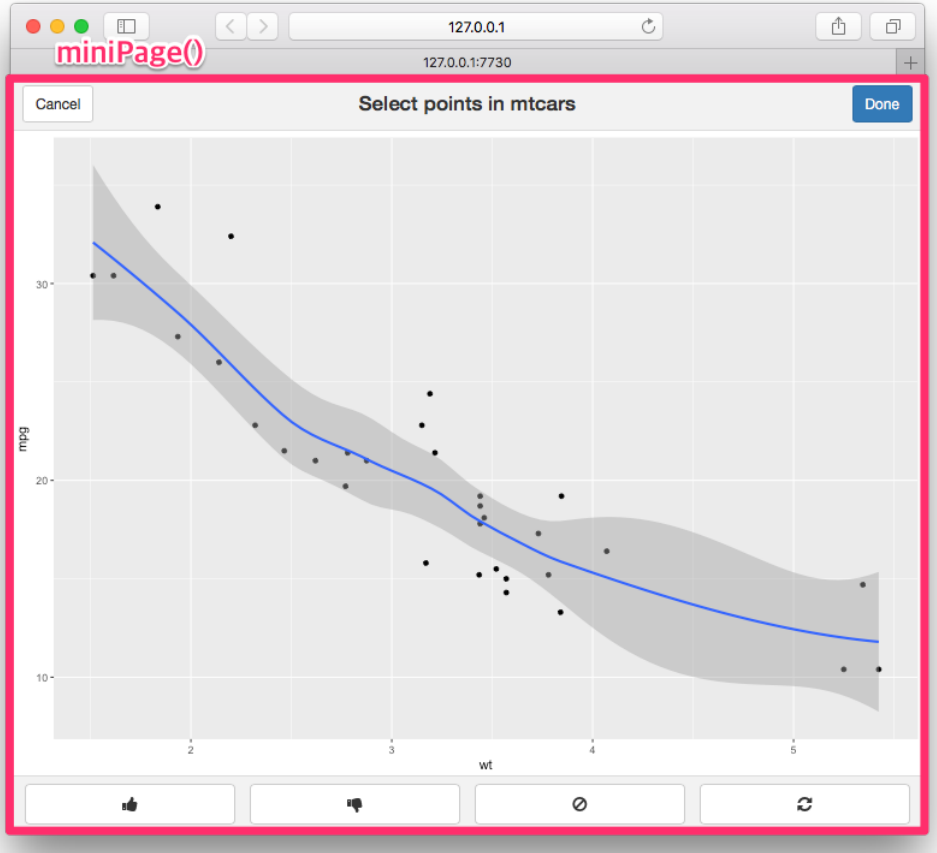


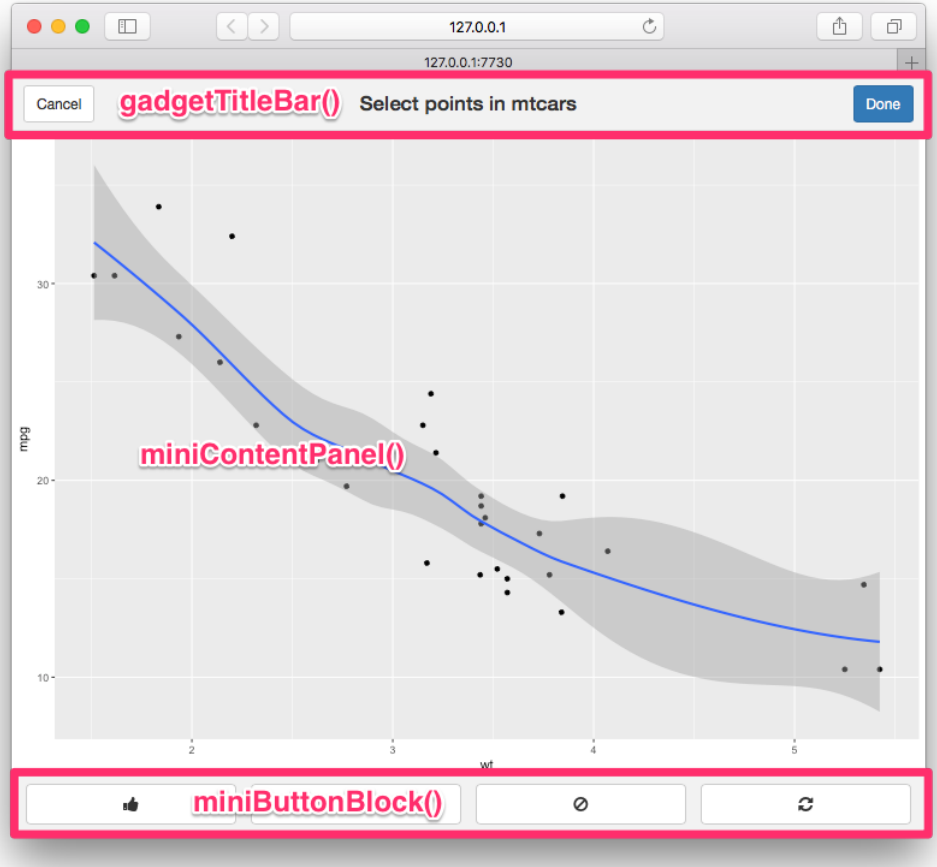
UI

```
ui <- miniPage(

      gadgetTitleBar(paste("Select points in", deparse(substitute(dat
      miniContentPanel(padding = 0,
        plotOutput("plot1", height = "100%", brush = "brush")
      ),
      miniButtonBlock(
        actionButton("add", "", icon = icon("thumbs-up")),
        actionButton("sub", "", icon = icon("thumbs-down")),
        actionButton("none", "", icon = icon("ban")),
        actionButton("all", "", icon = icon("refresh"))
      )
    )
```


127.0.0.1
127.0.0.1:7730
Cancel
Select points in mtcars
Done
mpg
30
20
10
2
3
4
5
wt


127.0.0.1
127.0.0.1:7730
miniPage()
Cancel
Select points in mtcars
Done
mpg
30
20
10
2
3
4
5
wt


127.0.0.1
127.0.0.1:7730
Cancel
gadgetTitleBar()
Select points in mtcars
Done
miniContentPanel()
mpg
30
20
10
2
3
4
5
wt
miniButtonBlock()

reactiveValues() 를 사용하여 현재 상태 저장

```
vals <- reactiveValues(keep = rep(TRUE, nrow(data)))

output$plot1 <- renderPlot({
    exclude <- data[!vals$keep, , drop = FALSE]
    include <- data[vals$keep, , drop = FALSE]

    ggplot(data, aes_string(x, y)) +
        geom_point() +
        geom_point(data = exclude, color = "grey80") +
        stat_smooth(data = include)
})
```

observeEvent() 로 현재상태를 update

```
  selected <- reactive({
            brushedPoints(data, input$brush, allRows = TRUE)$selected
        })

  observeEvent(input$add, vals$keep <- vals$keep | selected())
  observeEvent(input$sub, vals$keep <- vals$keep & !selected())
  observeEvent(input$all, vals$keep <- rep(TRUE, nrow(data)))
  observeEvent(input$none, vals$keep <- rep(FALSE, nrow(data)))
```

반환값

```
observeEvent(input$done, {
    stopApp(data[vals$keep, , drop = FALSE])
})
```

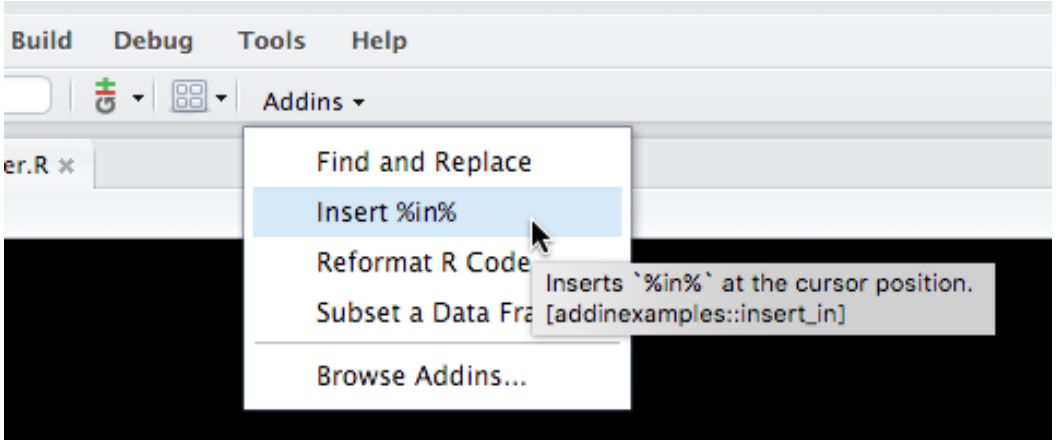
RStudio Addins

- RStudio (>= 0.99.878)

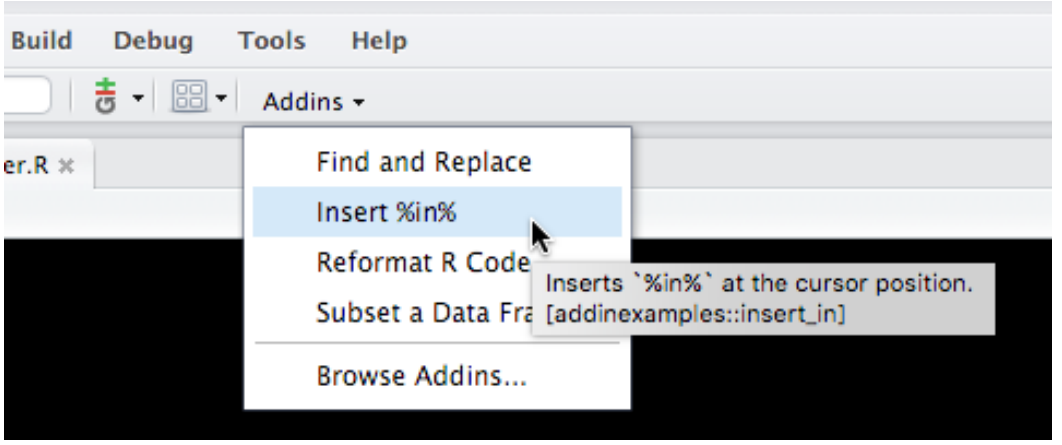
Install Addin Examples

```
devtools::install_github("rstudio/addinexamples", type = "source")
```

Running Addins



Running Addins




```
insertInAddin <- function() {
  rstudioapi::insertText(" %in% ")
}
```

RStudio API

- RStudio의 R code와 interact 할 수 있게 해준다.

```
install.packages("rstudioapi", type = "source")
```

Functions	Details
getActiveDocumentContext()	Returns information about the currently active RStudio document.
insertText(location, text, id = NULL)	Insert text at a specific location within a document.
setDocumentContext(text, id = NULL)	Set the contents of a document open in RStudio.

getActiveDocumentContext() returns list

- id — The unique document id.
- path — The path to the document on disk.
- contents — The contents of the document.
- selection — A list of selections.

Registering Addins

Registration file : located at **inst/rstudio/addins.dcf**

- Name: The name of the addin.
- Description: A description of the addin.
- Binding: The R function this addin is associated with.
- Interactive: Whether this addin is interactive (e.g. runs a Shiny application).

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For Example : insertInAddin

```
Name: Insert %in%
Description: Inserts `%in%` at the cursor position.
Binding: insertInAddin
Interactive: false
```

RStudio Addin 만들기

1. R 패키지 작성
2. R 함수 작성
3. **inst/rstudio/addins.dcf** 파일 작성
4. 패키지 설치

RStudio Addin 만들기

1. R 패키지 작성
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4. 패키지 설치

패키지를 설치할 때 RStudio 에서 addin 을 자동으로 등록한다. 하나의 패키지에 여러 개의 addin이 있는 경우 addins.dcf 파일에 여러 개의 addin을 등록할 수 있다. 이 때 각 addin 사이에 빈줄을 넣는다.

Gadget Viewer

- paneViewer(): RStudio viewer pane 에 Gadget을 시작
- dialogViewer(): modal Dialog 로 Gadget을 시작
- browserViewer(): 별도의 browser()창을 띄워 gadget 시작

Shiny Gadget 설치

```
Imports:
  shiny (>= 0.13),
  miniUI (>= 0.1.1),
  rstudioapi (>= 0.5)
```

editData 설치

- CRAN: https://cran.r-project.org/web/packages/editData/index.html

```
install.packages("editData")
```

- github: https://github.com/cardiomoon/editData

```
devtools::install_github("cardiomoon/editData")
```

editData 실행

```
library(editData)

result=editData("mtcars")
```