

R

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1 R

R

1.1

OS Windows Download R-4.x.x for Windows (x)

<https://cran.r-project.org/bin/windows/base/>

1.2

... ?

•

•

•

OK

•

Message translation R

```
# https://cell-innovation.nig.ac.jp/SurfWiki/R\_errormes\_lang.html
Sys.getenv("LANGUAGE") #
#
Sys.setenv(LANGUAGE="en") #
Sys.setenv(LANGUAGE="jp") #
```

•

Yes

- (MDI / SDI)
SDI MDI() 1 Window () SDI() Window
- (Plain text / HTML help)
Plain text Plain text HTML help (GoogleChrome)
- () OK

1.3

R

2

R

R

2.1 CRAN

CRAN R

<https://cran.r-project.org/>

R

https://cran.r-project.org/web/packages/available_packages_by_name.html

CRAN

```
# ( )  
options(repos = "https://cran.ism.ac.jp/")  
# 1  
install.packages("tidyverse")  
#  
pkg <- c("xlsx", "magrittr", "devtools")  
install.packages(pkg)
```

()

2.2 GitHub

CRAN GitHub

```
install.packages("devtools")  
devtools::install_github("matutosi/ecan")
```

3

R

script.R

R

.docx

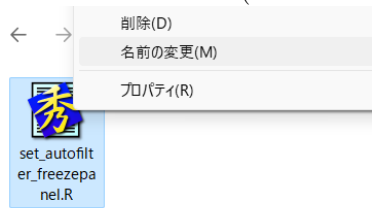
.xlsx

* R

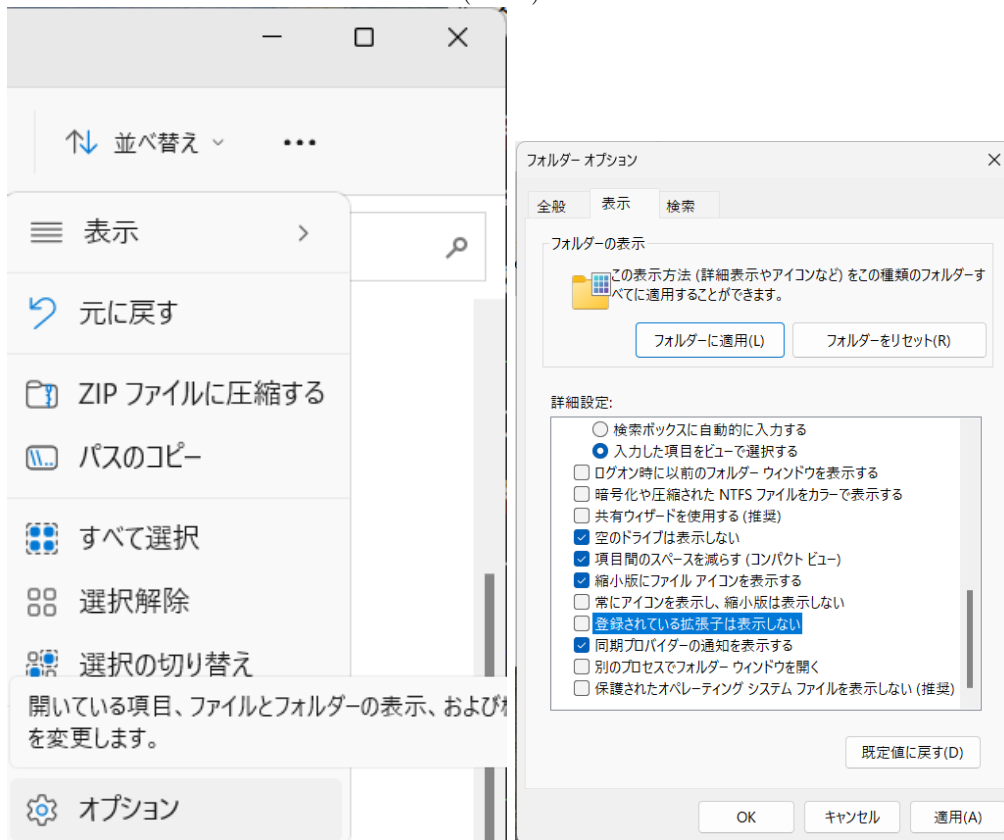
R

R

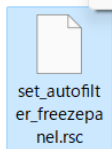
1. .R .scr (scr Rsc RSC OK)



2. () OK



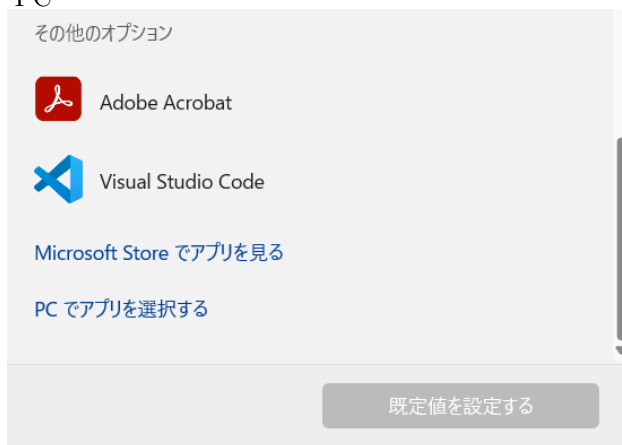
3. 新規 ショートカットの作成(S)
削除(D)
名前の変更(M)
プロパティ(R)



- 4.



5. PC

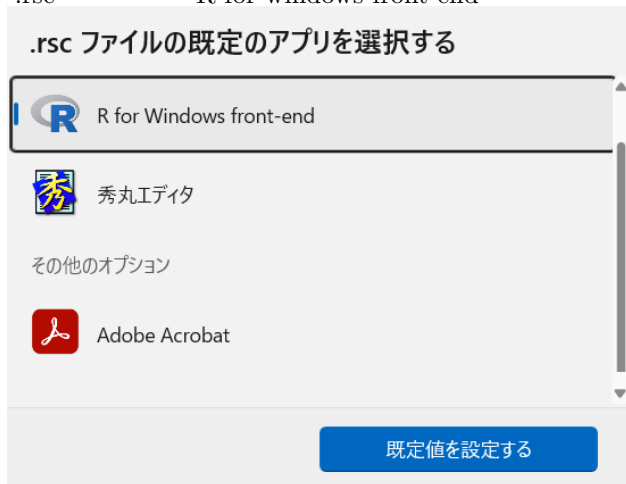


6. R (c:\Program files\R\R-4.2.3\bin\x64) Rscript.exe

> PC > Windows (C:) > Program Files > R > R-4.2.3 > bin > x64

名前	更新日時	種類	サイズ
Rterm.exe	2023/03/15 14:52	アプリケーション	88 KB
RSetReg.exe	2023/03/15 14:52	アプリケーション	88 KB
Rscript.exe	2023/03/15 14:52	アプリケーション	92 KB
Rgui.exe	2023/03/15 14:52	アプリケーション	86 KB
Rfe.exe	2023/03/15 14:52	アプリケーション	104 KB
Rcmd.exe	2023/03/15 14:52	アプリケーション	102 KB
R.exe	2023/03/15 14:52	アプリケーション	103 KB
open.exe	2023/03/15 14:52	アプリケーション	17 KB

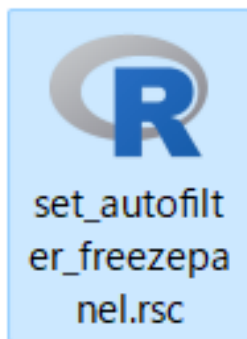
7. .rsc R for windows front-end



8. R for windows front-end OK



9. R OK



()

4 ggplot2

4.1 R

- base(graphics)
- lattice

- grid
- ggplot2

4.2 ggplot2

ggplot2 tidy data

4.3 ggplot2

1 plot facet

magrittr %\$% %T%

ggplot2

ggpubr

4.4 ggplot2

iris vegan dave tidy data

gather() spread() pivot_longer() pivot_wider() Hadley

aesthetics

geom_point() geom_bar() aes() colour group size

4.5 facet

for subset dplyr::filter

group VS facet

4.6 ggsave

- png PDF
- PDF png
-

4.7 (windows)

-cario?

4.8 theme

-
- theme_bw()

4.9 shiny

R reactive

4.10

- ggplot2
- ggplot2
- unwind GDA
-

5 magrittr

5.1 tidyverse magrittr

```
tidyverse R          R  tidyverse          tidyverse 1
library(tidyverse)

      (forcats tibble stringr dplyr tidyr purrr) %>% ( )      %>% tidyverse      %>%      magrittr
tidyverse      %>%
tidyverse      1      tibble
```

5.2 %>%

%>%

- %<>%
- %T>%
- %\$%

tidyverse magrittr

```
library(magrittr)

##
## Attaching package: 'magrittr'
## The following object is masked from 'package:purrr':
##
##      set_names
## The following object is masked from 'package:tidyr':
##
##      extract
```

5.3 %<>%

5.3.1

%<>%

```
mpg #

## # A tibble: 234 x 11
##   manufacturer model    displ  year   cyl trans drv     cty   hwy fl    class
##   <chr>          <chr>    <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
## 1 audi          a4         1.8  1999     4 auto~ f      18    29 p    comp~
## 2 audi          a4         1.8  1999     4 manu~ f      21    29 p    comp~
## 3 audi          a4         2    2008     4 manu~ f      20    31 p    comp~
## 4 audi          a4         2    2008     4 auto~ f      21    30 p    comp~
## 5 audi          a4         2.8  1999     6 auto~ f      16    26 p    comp~
## 6 audi          a4         2.8  1999     6 manu~ f      18    26 p    comp~
## 7 audi          a4         3.1  2008     6 auto~ f      18    27 p    comp~
## 8 audi          a4 quattro 1.8  1999     4 manu~ 4      18    26 p    comp~
## 9 audi          a4 quattro 1.8  1999     4 auto~ 4      16    25 p    comp~
## 10 audi          a4 quattro 2    2008     4 manu~ 4      20    28 p    comp~
## # ... with 224 more rows
```

```
tmp <- mpg
tmp <-
  tmp %>%
    dplyr::filter(year==1999) %>%
    tidyr::separate(trans, into=c("trans1", "trans2", NA)) %>%
    print()
```

```
## # A tibble: 117 x 12
##   manufac~1 model displ  year   cyl trans1 trans2 drv   cty   hwy fl   class
##   <chr>      <chr> <dbl> <int> <int> <chr> <chr> <chr> <int> <int> <chr> <chr>
## 1 audi      a4      1.8  1999   4 auto   l5     f     18    29 p   comp~
## 2 audi      a4      1.8  1999   4 manual m5     f     21    29 p   comp~
## 3 audi      a4      2.8  1999   6 auto   l5     f     16    26 p   comp~
## 4 audi      a4      2.8  1999   6 manual m5     f     18    26 p   comp~
## 5 audi      a4 q~    1.8  1999   4 manual m5     4     18    26 p   comp~
## 6 audi      a4 q~    1.8  1999   4 auto   l5     4     16    25 p   comp~
## 7 audi      a4 q~    2.8  1999   6 auto   l5     4     15    25 p   comp~
## 8 audi      a4 q~    2.8  1999   6 manual m5     4     17    25 p   comp~
## 9 audi      a6 q~    2.8  1999   6 auto   l5     4     15    24 p   mids~
## 10 chevrolet c150~  5.7  1999   8 auto   l4     r     13    17 r   suv
## # ... with 107 more rows, and abbreviated variable name 1: manufacturer
```

```
tmp <- mpg
tmp %<>%
  dplyr::filter(year==1999) %>%
  tidyr::separate(trans, into=c("trans1", "trans2", NA)) %>%
  print()
```

```
## # A tibble: 117 x 12
##   manufac~1 model displ  year   cyl trans1 trans2 drv   cty   hwy fl   class
##   <chr>      <chr> <dbl> <int> <int> <chr> <chr> <chr> <int> <int> <chr> <chr>
## 1 audi      a4      1.8  1999   4 auto   l5     f     18    29 p   comp~
## 2 audi      a4      1.8  1999   4 manual m5     f     21    29 p   comp~
## 3 audi      a4      2.8  1999   6 auto   l5     f     16    26 p   comp~
## 4 audi      a4      2.8  1999   6 manual m5     f     18    26 p   comp~
## 5 audi      a4 q~    1.8  1999   4 manual m5     4     18    26 p   comp~
## 6 audi      a4 q~    1.8  1999   4 auto   l5     4     16    25 p   comp~
## 7 audi      a4 q~    2.8  1999   6 auto   l5     4     15    25 p   comp~
## 8 audi      a4 q~    2.8  1999   6 manual m5     4     17    25 p   comp~
## 9 audi      a6 q~    2.8  1999   6 auto   l5     4     15    24 p   mids~
## 10 chevrolet c150~  5.7  1999   8 auto   l4     r     13    17 r   suv
## # ... with 107 more rows, and abbreviated variable name 1: manufacturer
```

5.3.2

5.4 %T>%

5.4.1

imap

```
mpg #
```

```
## # A tibble: 234 x 11
```

```
##      manufacturer model      displ  year   cyl trans drv      cty   hwy fl      class
##      <chr>          <chr>    <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>
##  1 audi            a4          1.8  1999    4 auto~ f      18    29 p      comp~
##  2 audi            a4          1.8  1999    4 manu~ f      21    29 p      comp~
##  3 audi            a4          2    2008    4 manu~ f      20    31 p      comp~
##  4 audi            a4          2    2008    4 auto~ f      21    30 p      comp~
##  5 audi            a4          2.8  1999    6 auto~ f      16    26 p      comp~
##  6 audi            a4          2.8  1999    6 manu~ f      18    26 p      comp~
##  7 audi            a4          3.1  2008    6 auto~ f      18    27 p      comp~
##  8 audi            a4 quattro  1.8  1999    4 manu~ 4      18    26 p      comp~
##  9 audi            a4 quattro  1.8  1999    4 auto~ 4      16    25 p      comp~
## 10 audi            a4 quattro  2    2008    4 manu~ 4      20    28 p      comp~
## # ... with 224 more rows
```

5.4.2

```
<- <<- . {} %>%
```

```
# mpg %T>%
# {
#   tmp <- dplyr::select(., )
# } %>%
```

5.5 %\$%

5.5.1

```
mpg %>%
  .$manufacturer
```

```
## [1] "audi"      "audi"      "audi"      "audi"      "audi"
## [6] "audi"      "audi"      "audi"      "audi"      "audi"
## [11] "audi"      "audi"      "audi"      "audi"      "audi"
## [16] "audi"      "audi"      "audi"      "chevrolet" "chevrolet"
## [21] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [26] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [31] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [36] "chevrolet" "chevrolet" "dodge"      "dodge"      "dodge"
## [41] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [46] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [51] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [56] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [61] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [66] "dodge"      "dodge"      "dodge"      "dodge"      "dodge"
## [71] "dodge"      "dodge"      "dodge"      "dodge"      "ford"
## [76] "ford"       "ford"       "ford"       "ford"       "ford"
## [81] "ford"       "ford"       "ford"       "ford"       "ford"
## [86] "ford"       "ford"       "ford"       "ford"       "ford"
## [91] "ford"       "ford"       "ford"       "ford"       "ford"
## [96] "ford"       "ford"       "ford"       "ford"       "honda"
## [101] "honda"      "honda"      "honda"      "honda"      "honda"
## [106] "honda"      "honda"      "honda"      "hyundai"    "hyundai"
## [111] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [116] "hyundai"    "hyundai"    "hyundai"    "hyundai"    "hyundai"
## [121] "hyundai"    "hyundai"    "jeep"       "jeep"       "jeep"
```

```
## [126] "jeep"      "jeep"      "jeep"      "jeep"      "jeep"
## [131] "land rover" "land rover" "land rover" "land rover" "lincoln"
## [136] "lincoln"   "lincoln"   "mercury"    "mercury"    "mercury"
## [141] "mercury"   "nissan"     "nissan"     "nissan"     "nissan"
## [146] "nissan"     "nissan"     "nissan"     "nissan"     "nissan"
## [151] "nissan"     "nissan"     "nissan"     "nissan"     "pontiac"
## [156] "pontiac"   "pontiac"   "pontiac"    "pontiac"    "subaru"
## [161] "subaru"    "subaru"    "subaru"     "subaru"     "subaru"
## [166] "subaru"    "subaru"    "subaru"     "subaru"     "subaru"
## [171] "subaru"    "subaru"    "subaru"     "toyota"     "toyota"
## [176] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [181] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [186] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [191] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [196] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [201] "toyota"    "toyota"    "toyota"     "toyota"     "toyota"
## [206] "toyota"    "toyota"    "volkswagen" "volkswagen" "volkswagen"
## [211] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [216] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [221] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [226] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [231] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
```

mpg %\$%

manufacturer

```
## [1] "audi"      "audi"      "audi"      "audi"      "audi"
## [6] "audi"      "audi"      "audi"      "audi"      "audi"
## [11] "audi"      "audi"      "audi"      "audi"      "audi"
## [16] "audi"      "audi"      "audi"      "chevrolet"  "chevrolet"
## [21] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [26] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [31] "chevrolet" "chevrolet" "chevrolet" "chevrolet" "chevrolet"
## [36] "chevrolet" "chevrolet" "dodge"     "dodge"     "dodge"
## [41] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [46] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [51] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [56] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [61] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [66] "dodge"     "dodge"     "dodge"     "dodge"     "dodge"
## [71] "dodge"     "dodge"     "dodge"     "dodge"     "ford"
## [76] "ford"      "ford"      "ford"      "ford"      "ford"
## [81] "ford"      "ford"      "ford"      "ford"      "ford"
## [86] "ford"      "ford"      "ford"      "ford"      "ford"
## [91] "ford"      "ford"      "ford"      "ford"      "ford"
## [96] "ford"      "ford"      "ford"      "ford"      "honda"
## [101] "honda"     "honda"     "honda"     "honda"     "honda"
## [106] "honda"     "honda"     "honda"     "hyundai"    "hyundai"
## [111] "hyundai"   "hyundai"   "hyundai"   "hyundai"   "hyundai"
## [116] "hyundai"   "hyundai"   "hyundai"   "hyundai"   "hyundai"
## [121] "hyundai"   "hyundai"   "jeep"      "jeep"      "jeep"
## [126] "jeep"      "jeep"      "jeep"      "jeep"      "jeep"
## [131] "land rover" "land rover" "land rover" "land rover" "lincoln"
## [136] "lincoln"   "lincoln"   "mercury"    "mercury"    "mercury"
## [141] "mercury"   "nissan"     "nissan"     "nissan"     "nissan"
```

```
## [146] "nissan"      "nissan"      "nissan"      "nissan"      "nissan"
## [151] "nissan"      "nissan"      "nissan"      "nissan"      "pontiac"
## [156] "pontiac"    "pontiac"    "pontiac"    "pontiac"    "subaru"
## [161] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [166] "subaru"     "subaru"     "subaru"     "subaru"     "subaru"
## [171] "subaru"     "subaru"     "subaru"     "toyota"     "toyota"
## [176] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [181] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [186] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [191] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [196] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [201] "toyota"     "toyota"     "toyota"     "toyota"     "toyota"
## [206] "toyota"     "toyota"     "volkswagen" "volkswagen" "volkswagen"
## [211] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [216] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [221] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [226] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
## [231] "volkswagen" "volkswagen" "volkswagen" "volkswagen" "volkswagen"
```

5.5.2

6 rvest

6.1

```
R      rvest      rvest

R      rvest

      ( CRAN      )      RStudio usethis,
testthat, devtools
```

6.2 rvest RSelenium

```
R      rvest RSelenium      rvest      URL
RSelenium      Selenium      Javascript
rvest      polite
```

6.3 rvest

- HTML
- DOM : id, class, tagName
- table
 - HTML table table
-
- stringr
- stringi

- tidyverse magrittr
- Form radio moranajp::html_radio_set() radio radio
polite

6.4

```
# install.packages("rvest")
# library(rvest)
```

6.5 HTML

6.5.1

6.5.2

6.6 DOM

6.6.1

6.6.2

7 Relenium

Selenium

Javascript PHP URL rvest

7.1

- RSelenium: CRAN
- Selenium:
 - : ver3.xxx
 - ver4.0 RSeleniumu (Python)
- ChromeDriver
 - : () GoogleChrome update
 - Selenium

7.2

7.3

7.3.1

7.3.2

7.4

id document.getElementById()

xpath document.selectQueryAll()

JavaScript script <- " " rem\$execute(script)

BiSS

HTML

HTML

7.5

- R
 - png PDF
 -
 - Seleniumu
 - MeCab GINZA

8 shell

- R
 -
 - PDF
 - png PDF

shell (R) CUI R Linux Mac shell Windows R

PDF 1 PDF

windows Linux Mac

dos ls, dir move, copy, remove, rename , cd

R shell(), system() setwd() cd paste0() stringr stringi

stringr stringi purrr::map() for loop #

concatPDF PDF (win10 OK win11 NG) # ConcatPDF /outfile Merged.pdf File1.pdf File2.pdf File3.pdf

pdftk PDF (win11 OK) pdftk File1.pdf File2.pdf File3.pdf cat output Merged.pdf

ImageMagick

8.1

9 DBI

9.1

CRAN Task View: Databases with R <https://cran.r-project.org/web/views/Databases.html>

DBI <https://cran.r-project.org/web/packages/DBI/index.html>

9.2 DBI

-
- SQL

SQL SQL R R DBI dplyr tidyverse
ggplot2

9.3

```
install.packages("DBI")  
library(DBI)
```

9.4

<https://cran.r-project.org/web/packages/DBI/vignettes/DBI-1.html>

10 xlsx




xlsx

10.1

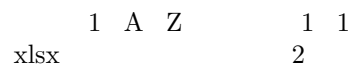
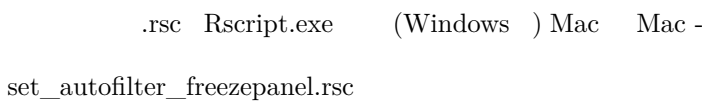
xlsx

10.1.1

- R
- set_autofilter_freezepanel.rsc ()
- set_autofilter_freezepanel.rsc

名前	更新日時	種類	サイズ
 book1.xlsx	2023/04/10 12:22	Microsoft Excel ワ...	10 KB
 book2.xls	2023/04/10 12:22	Microsoft Excel 97...	29 KB
 set_autofilter_freezepanel.rsc	2023/04/09 9:55	RSC ファイル	1 KB

-



10.1.2

```
# Package,
if(! "xlsx" %in% installed.packages()[,1]){ # xlsx
#
  options(repos = "https://cran.ism.ac.jp/") #
  install.packages("xlsx") #
}

# Functions,
set_auto_filter <- function(sh){
# A1 Z1
#           "A1:Z1"
  xlsx::addAutoFilter(sh, "A1:Z1")
}
set_freeze_panel <- function(sh){
# 1 1
#
#      2      2 4 3
#      3      3 5 4
  xlsx::createFreezePane(sh, 2, 2, 2, 2)
}
set_af_fp <- function(file){
  wb <- xlsx::loadWorkbook(file) #
  for(sh in xlsx::getSheets(wb)){ #
    set_auto_filter(sh) #
    set_freeze_panel(sh) #
  }
  xlsx::saveWorkbook(wb, file) #
}

# Main,
files <- list.files(pattern = "xls") # ".xls" "xlsx"
for(file in files){ #
  set_af_fp(file) # set_af_fp()
}
```

10.2 ()