R

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## Chapter 1

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Excel Excel Excel	
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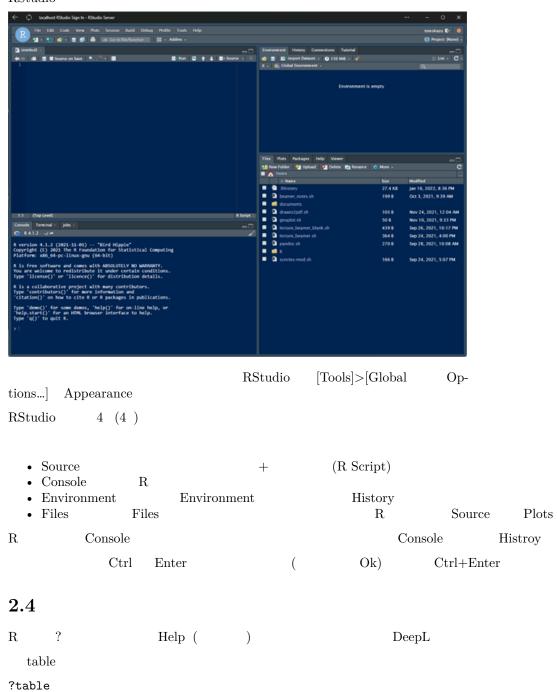
# Chapter 2

## R RStudio

2.1 R									
R	Window	s Mac Linux	R	(		) RStudio R			
	Mac > L	inux > Windows	( )	R	Mac Linux	Li	nux	R	Wind
Windows	WSL	Linux R	WS	SL R RStı	udio Server	Chrome	RStudi	io (	)
2.2									
				Ubuntu	Mac Windows				
2.2.1 M	[ac								
<ul><li>Home</li><li>Home</li><li>XCode</li></ul>	brew	Homebrew Command Lin		nd Line T	ools				
xcode-sele	ectins	tall							
	inux (WSL )	RStudio Ser	ver (	Chrome	RStudio	R RSt	udio	( )	(
2.2.3 W	$^{7}{ m indows}$								
<ul><li> Rtools</li><li> (</li></ul>	s Ok	r( R	W	indows	)				

#### 2.3 RStudio

#### RStudio



2.5.

2.5

Tutorial R R

2.6

R install.packages tidyverse

install.packages("tidyverse")

library

library(tidyverse)

### Chapter 3

## ${f R}$

```
3.1
R
              ( )
         2 b 1.5
  \mathbf{a}
a <- 2
b <- 2.5
## [1] 2
## [1] 2.5
a+b
## [1] 4.5
a*b
## [1] 5
a, b 2 2.5
                a,b
 RStudio "Environment"
                          a b
```

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Figure 3.1: Environment

```
name <- " "
gender <- " "
age <- "20"

Environment History Connections Tutorial
```

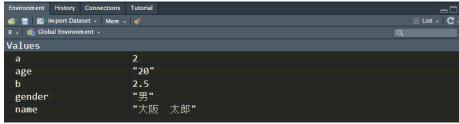


Figure 3.2: Environment

name	"	"	gender	" " age	"20"	
age	"20"	20		age		
age+10						

## Error in age + 10:

(Type) a b (numeric) name gender age (character)

Environment List Grid

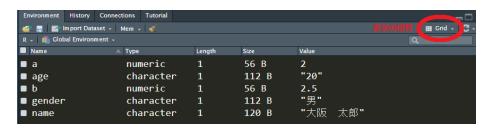


Figure 3.3: Grid

as.numeric()

3.2.

```
as.numeric(age)+10
## [1] 30
   age
           as.numeric(age) age
               as.character()
3.2
1
                                                                                c(1, 2,...)
                                                    3
                                                                   3
                                          name
                                                           age
name <- c(" "," ","
                                  ")
age \leftarrow c(19,21,20)
name age
name
## [1] "
age
## [1] 19 21 20
                         \mathbf{R}
name age
                                                                    ⊞ Grid → C
  ∏ Im port Dataset → Me
```

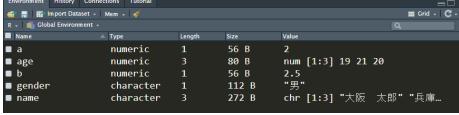


Figure 3.4:

```
Environment name age Length 1 3 Length ( )

1 [ ] 1 ( 0 ) name 2

name[2]

## [1] " "
```

#### 3.3

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```
gender <- c(" "," "," ")</pre>
gender <- as.factor(gender)</pre>
gender
gender
## [1]
## Levels:
       3 ( )
                          2
                                                 gender\_num
factor
                     factor
                               gender
gender_num <- as.numeric(gender)</pre>
gender_num
## [1] 2 1 2
  (1 \ 2)
                          Levels
                                            factor levels
gender <- factor(gender, levels=c(" "," "))</pre>
gender
## [1]
## Levels:
as.numeric(gender)
## [1] 1 2 1
3.3.1
      1
           factor
                4
                     factor
                                     2
     category4 factor
category4 <- c("
                    ")
category4 <- as.factor(category4)</pre>
{\tt category 4}
```

```
3.4.
                                                                          15
## [1]
## [7]
## Levels:
  category4
category4
                1 2
                        34
                                         2 category2
cat2 <- c(" "," "," "," ")
category4_num <- as.numeric(category4)</pre>
category2 <- cat2[category4_num]</pre>
category2 <- as.factor(category2)</pre>
category2
## [1]
## Levels:
3.4
                                            3
                                                                                    gender(factor) 1
                                                      name( )
                                                                       age( )
                                                                                                          df
df <- data.frame(name, age, gender)</pre>
df
##
            name age gender
## 1
            19
## 2
            21
## 3
            20
 3(3
        ) 3(name, age, gender 3
Environment df
                                        Environment List
 Environment History Connections Tutorial
Data.
   f 3 obs. of 3 variables
$ name : chr "大阪 太郎" "兵庫 太郎 "京都 花子"
$ age : num 19 21 20
ÐJF
   $ gender: Factor w/ 2 levels "男","女": 1 2 1
Values
 а
  age
                    num [1:3] 19 21 20
                    2.5
 b
                    chr [1:4] "大人" "大人" "子ども" "子ども"
  cat2
                    Factor w/ 2 levels "大人","子ども": 1 2 1 2 1 1 2 2 1 2
 category2
```

Figure 3.5:

( df) Excel

CHAPTER 3. R



Figure 3.6:

( ) \$ df age ( ) df\$age  $3 \\ \label{eq:df} $$ mean(df$age) $$ 

## [1] 20

#### Chapter 4

1

```
R
        tidyverse stargazer
4.1
     \mathbf{R}
                iris
                                 iris
iris <- iris
                            ( )
               (3) ()
iris
      150
                         Sepal.Length
                         Sepal.Width
                         Petal.Length
                         Petal.Width
                          Species
                        glimpse()
                                      (tidyverse
                                                  )
glimpse(iris)
## Rows: 150
## Columns: 5
## $ Sepal.Length <dbl> 5.1, 4.9, 4.7, 4.6, 5.0, 5.4, 4.6, 5.0, 4.4, 4.9, 5.4, 4.~
## $ Sepal.Width <dbl> 3.5, 3.0, 3.2, 3.1, 3.6, 3.9, 3.4, 3.4, 2.9, 3.1, 3.7, 3.~
## $ Petal.Length <dbl> 1.4, 1.4, 1.3, 1.5, 1.4, 1.7, 1.4, 1.5, 1.4, 1.5, 1.5, 1.~
## $ Petal.Width <dbl> 0.2, 0.2, 0.2, 0.2, 0.2, 0.4, 0.3, 0.2, 0.2, 0.1, 0.2, 0.~
                  <fct> setosa, setosa, setosa, setosa, setosa, setosa, setosa, s~
## $ Species
```

```
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```

```
( ) 150 ( ) 5 5 <dbl> <fct> dbl fct
```

#### 4.2

```
summary()
```

```
summary(iris)
     Sepal.Length
                       Sepal.Width
                                        Petal.Length
                                                          Petal.Width
##
           :4.300
                              :2.000
                                               :1.000
                                                                 :0.100
    Min.
                      Min.
                                       Min.
                                                         Min.
##
    1st Qu.:5.100
                      1st Qu.:2.800
                                       1st Qu.:1.600
                                                         1st Qu.:0.300
    Median :5.800
                      Median :3.000
                                       Median :4.350
##
                                                         Median :1.300
                             :3.057
##
    Mean
           :5.843
                      Mean
                                       Mean
                                               :3.758
                                                         Mean
                                                                 :1.199
##
    3rd Qu.:6.400
                      3rd Qu.:3.300
                                       3rd Qu.:5.100
                                                         3rd Qu.:1.800
##
    Max.
            :7.900
                      Max.
                              :4.400
                                       Max.
                                               :6.900
                                                         Max.
                                                                 :2.500
##
           Species
##
    setosa
               :50
    versicolor:50
##
##
    virginica:50
##
##
##
                  (1st Qu.) (Median)
         (Min.)
                                       (Mean)
                                                  (3rd Qu.) (Max)
                        summarize()
summarize(iris,
                   = mean(Sepal.Length),
                = sd(Sepal.Length),
                   = mean(Petal.Length),
                = sd(Petal.Length)
##
       5.843333
                       0.8280661
                                       3.758
                                                     1.765298
summarize() 1
                          2
                                         = ( )
                                                                                    \mathbf{x}
mean(x)
                                     х
var(x)
                                     \mathbf{X}
sd(x)
                                     \mathbf{x}
max(x)
                                     \mathbf{X}
median(x)
                                     х
min(x)
                                     х
```

4.3. 19

```
x XX\times 100
quantile(x, XX)
                                              quantile(x,0.25)
                                  e.g. \times 25
summarize()
               stargazer
stargazer(iris, type = "text", title=" ", digits=2,
          summary.stat = c("mean", "sd", "min", "p25", "median", "p75", "max"))
##
##
## -----
               Mean St. Dev. Min Pctl(25) Median Pctl(75) Max
## Statistic
## Sepal.Length 5.84
                                                     6.40
                                                            7.90
                      0.83
                              4.30
                                     5.10
                                             5.80
## Sepal.Width 3.06
                      0.44
                              2.00
                                     2.80
                                             3.00
                                                     3.30
                                                            4.40
## Petal.Length 3.76
                       1.77
                                     1.60
                                                            6.90
                              1.00
                                             4.35
                                                     5.10
## Petal.Width 1.20
                       0.76
                              0.10
                                     0.30
                                             1.30
                                                     1.80
                                                            2.50
                                                                     ) "html" "latex"
                                                           "text"(
                                                                                         title
stargazer()
           1
                      iris)
                                                   type
                                    mean
                                    \operatorname{sd}
                                    min
                                    max
                        XX
                                    pXX
4.3
```

## Sepal.Width

## Petal.Length

-0.1175698

1.0000000

0.8717538 -0.4284401

```
cor()
                                           Species
                                                                         iris
                                                                                                 cor()
                                   iris
                                           2
                                                                select(dataframe,a,b) dataframe$a dataframe$b
select()
         select(dataframe,-a) dataframe a
                                                                  select(dataframe,2:4) dataframe 2 4
            4
iris 5
                             Species
                                        cor()
cor(select(iris,-Species))
##
                 Sepal.Length Sepal.Width Petal.Length Petal.Width
## Sepal.Length
                     1.0000000 -0.1175698
                                                 0.8717538
                                                              0.8179411
```

-0.4284401

1.0000000

-0.3661259

0.9628654

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```
## Petal.Width
              0.8179411 -0.3661259
                                  0.9628654
                                            1.0000000
cor(select(iris,1:4))
cor(select(iris, Sepal.Length, Sepal.Width, Petal.Length, Petal.Width)
4.4
                   setosa versicolor virginica 3
             iris
4.4.1
                        ()
            filter()
iris_setosa <- filter(iris, Species=="setosa")</pre>
iris_versicolor <- filter(iris, Species=="versicolor")</pre>
iris_virginica <- filter(iris, Species=="virginica")</pre>
stargazer(iris_setosa, type = "text", title="setosa", digits=2,
       summary.stat = c("mean", "sd", "min", "p25", "median", "p75", "max"))
##
## setosa
Mean St. Dev. Min Pctl(25) Median Pctl(75) Max
## Sepal.Length 5.01 0.35 4.30 4.80 5.00 5.20 5.80
## Sepal.Width 3.43 0.38 2.30 3.20 3.40 3.68 4.40
## Petal.Length 1.46 0.17 1.00 1.40
                                   1.50
                                        1.58 1.90
## Petal.Width 0.25 0.11 0.10 0.20 0.20
                                         0.30 0.60
## -----
stargazer(iris_versicolor, type = "text", title="versicolor", digits=2,
       summary.stat = c("mean", "sd", "min", "p25", "median", "p75", "max"))
##
## versicolor
Mean St. Dev. Min Pctl(25) Median Pctl(75) Max
## Statistic
## -----
## Sepal.Length 5.94 0.52 4.90 5.60 5.90 6.30 7.00
## Sepal.Width 2.77 0.31 2.00 2.52 2.80 3.00 3.40
## Petal.Length 4.26 0.47 3.00 4.00 4.35 4.60 5.10
## Petal.Width 1.33 0.20 1.00 1.20 1.30 1.50 1.80
```

4.4.

```
stargazer(iris_virginica, type = "text", title="virginica", digits=2,
         summary.stat = c("mean", "sd", "min", "p25", "median", "p75", "max"))
##
## virginica
## -----
            Mean St. Dev. Min Pctl(25) Median Pctl(75) Max
                                                        7.90
## Sepal.Length 6.59
                     0.64
                            4.90
                                  6.23
                                          6.50
                                                 6.90
## Sepal.Width 2.97
                   0.32 2.20
                                 2.80
                                         3.00
                                                 3.18 3.80
## Petal.Length 5.55
                   0.55
                           4.50
                                5.10
                                         5.55
                                                 5.88 6.90
## Petal.Width 2.03
                     0.27
                           1.40 1.80
                                          2.00
                                                 2.30
                                                       2.50
4.4.2 group_by()
group_by
                          1
                                                                           summarize()
iris_grouped <- group_by(iris, Species)</pre>
summarize(iris_grouped,
                = mean(Sepal.Length),
             = sd(Sepal.Length),
               = mean(Petal.Length),
             = sd(Petal.Length)
         )
## # A tibble: 3 x 5
    Species
    <fct>
                   <dbl>
                                            <dbl>
                                                          <dbl>
                                 <dbl>
## 1 setosa
                    5.01
                                 0.352
                                            1.46
                                                          0.174
## 2 versicolor
                    5.94
                                            4.26
                                 0.516
                                                          0.470
## 3 virginica
                    6.59
                                 0.636
                                            5.55
                                                          0.552
4.4.3 xtabs()
                         2
xtabs()
                    1
                                     ~x1+x2+... y~x1+x2+...
                                                               ~x1+x2
                                                                         x1,x2
          Species 1
iris
                       xtabs()
                                    Species
xtabs(~Species,iris)
## Species
##
      setosa versicolor virginica
##
          50
                    50
     Species
```

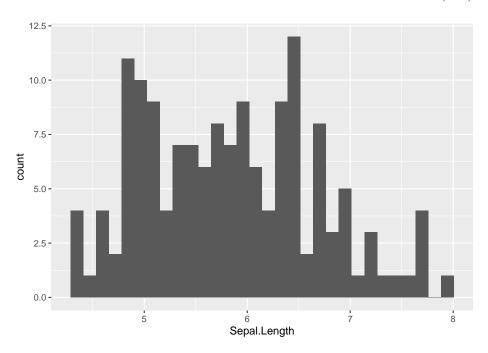
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#### Chapter 5

2( )

```
\mathbf{R}
                 ggplot2
                                               ggplot2 tidyverse
                                                                       tidyverse
library(tidyverse)
       iris
iris <- iris
5.1
 150
ggplot2
g <- iris %>%
  ggplot(aes(x=Sepal.Length))
                                                  \operatorname{ggplot}()
                   ggplot()
                                                                                                 ggplot()
                                                                                aes()
                                                                       х у
g <- g+geom_histogram()</pre>
   ggplot
      plot()
plot(g)
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

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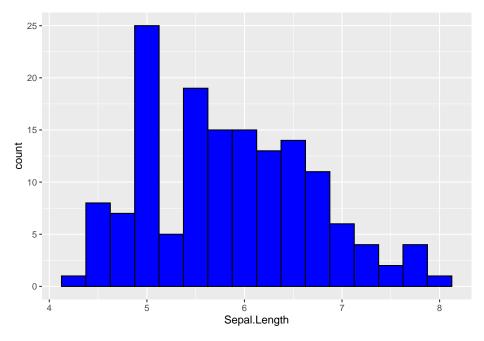


R

#### ${\tt geom\_histogram}()$

```
g <- iris %>%
  ggplot(aes(x=Sepal.Length))+
  geom_histogram(binwidth=0.25,color="black", fill="blue")
plot(g)
```

5.1.



labs()

```
g <- iris %>%
  ggplot(aes(x=Sepal.Length))+
  geom_histogram(binwidth=0.25,color="black", fill="blue")+
  labs(x = " ", y = " ", title = " ")

plot(g)
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                 1 1
## 'mbcsToSbcs'
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                 1 1
                       : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                      : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <ba>
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                       : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
```

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```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                      : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                      : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                      : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                      : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
```

5.1.

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
```

5.1.

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
```

```
##
## Warning in grid.Call(C textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
```

## 'mbcsToSbcs' ' ' : <90>

5.1.

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                         : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               ' ' : <87>
## 'mbcsToSbcs'
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               ' ' : <95>
## 'mbcsToSbcs'
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <b7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                        : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                        : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <e7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                      : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                      : <87>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <95>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <b7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <a0>
```

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```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                       : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                        : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               ' ' : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
                        : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                       : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                        : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                            : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                           : <82>
## 'mbcsToSbcs' ' '
```

5.1.

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
```

5.1.

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <a4>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                           : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                           : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                           : <83>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e7>
```

CHAPTER 5. 2(

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                                                  : <89>
 \begin{tabular}{ll} \be
## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
                                                   : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' ' : <e7>
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' ' : <e8>
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' ' : <bc>
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## 'mbcsToSbcs' ' ' : <e7>
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
                                 1 1
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## 'mbcsToSbcs' ' '
                                                  : <e8>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                                 1 1
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
                                 1 1
## 'mbcsToSbcs'
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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                                                  : <e9>
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' ' : <e9>
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e5>
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## 'mbcsToSbcs' ' ' : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                       : <e9>
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## 'mbcsToSbcs' ' ' : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                      : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               ' ' : <e5>
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                ' ' : <ba>
## 'mbcsToSbcs'
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## 'mbcsToSbcs'
                1 1
                       : <a6>
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## 'mbcsToSbcs'
               ' ' : <e9>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                       : <a0>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bb>
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' : <82>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
```

```
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
```

```
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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##
```

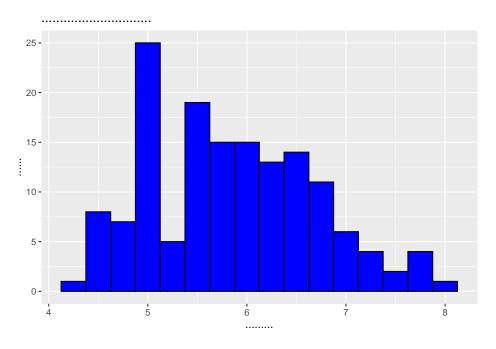
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```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
```



## #theme\_set( theme\_gray(base\_family = "IPAexGothic")) plot(g)

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                 1 1
## 'mbcsToSbcs'
                       : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                      : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
```

```
## 'mbcsToSbcs' ' ' : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                      : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                          : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e7>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <87>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                         : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               ' ' : <95>
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <b7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                      : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                        : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <87>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                      : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                      : <95>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <b7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e5>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                       : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                       : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                       : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                       : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                       : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bb>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <ba>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                       : <a6>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs' ' : <ae>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs' ' : <e3>
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## 'mbcsToSbcs' ' : <83>
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\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
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## 'mbcsToSbcs' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs' ' : <89>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs' ' : <e5>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               ' ' : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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                       : <bc>
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## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' ' : <87>
```

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```
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                                                  : <e9>
 \begin{tabular}{ll} \be
## 'mbcsToSbcs' ' '
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                                1 1
## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs'
                                1 1
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                                 1 1
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                                1 1
## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                                1 1
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## 'mbcsToSbcs'
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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               1 1
## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               ' ' : <e8>
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## 'mbcsToSbcs'
                1 1
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               ' ' : <bc>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
                1 1
## 'mbcsToSbcs'
                        : <e9>
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## 'mbcsToSbcs'
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                        : <95>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                      : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bc>
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## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' ' : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <87>
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```
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## 'mbcsToSbcs'
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                                                  : <bc>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                                 1 1
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                                1 1
                                                : <89>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
                                 1 1
## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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                                                  : <b7>
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## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <a6>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <e9>
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## 'mbcsToSbcs'
                1 1
                       : <a0>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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                       : <a6>
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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                       : <a0>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                       : <bb>
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                 1 1
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
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                       : <ba>
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
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```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
```

5.1.

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
```

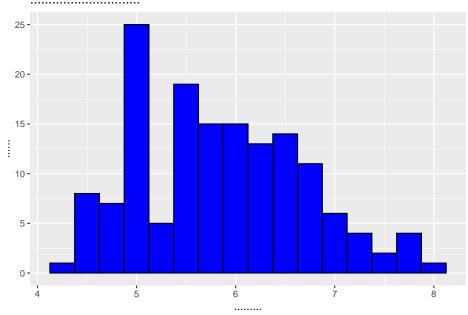
```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a4>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <83>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a1>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
```

## 'mbcsToSbcs' ' : <e3>

5.1.

```
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
\verb|## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
```

```
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
\verb|## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <88>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <86>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b8>
##
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                    ' : <83>
##
```



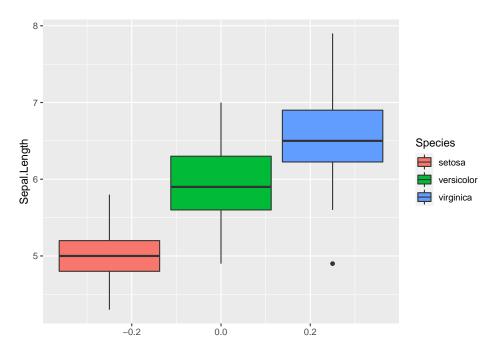
5.2.

```
\begin{split} & IPAexGothic & IPAexGothic & IPA \\ & theme\_gray() & theme\_bw() \end{split}
```

## 5.2

```
bp <- iris %>%
   ggplot(aes(y=Sepal.Length, fill=Species))+
   geom_boxplot()

plot(bp)
```



ggplot aes() fill

Species

## 5.3

```
scatter <- iris %>%
  ggplot(aes(x=Sepal.Length, y=Sepal.Width))+
  geom_point()

plot(scatter)
```

```
4.5 -
  4.0 -
  3.5
Sepal.Width 3.0
  2.5 -
  2.0 -
                               Sepal.Length
    aes() x y
                     geom_point()
                    aes() color
                                          Species
scatter <- iris %>%
  ggplot(aes(x=Sepal.Length, y=Sepal.Width, color=Species))+
  geom_point()+
  labs(x=" ",y=" ", title="
plot(scatter)
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                 ' ' : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                 1 1
                          : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                 1 1
                        : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                          : <e7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                          : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <87>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e5>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <b9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                        : <85>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <e7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                         : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                       : <87>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                1 1
                        : <b9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <85>
\verb|## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                    ' : <e8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                           : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                            : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                            : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a8>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <85>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <96>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bf>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e8>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <90>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <bc>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e7>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <89>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <87>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                         : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b7>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                          : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <95>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a8>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e5>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <b9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <85>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e3>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <81>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <ae>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <e9>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' '
                         : <96>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <a2>
```

```
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                            : <e4>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                           : <bf>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' : <82>
##
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
               1 1
                      : <e8>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <90>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
               1 1
## 'mbcsToSbcs'
                      : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                      : <e7>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs'
                       : <89>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <87>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e9>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <95>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
                        : <b7>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <bc>
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' ' : <e7>
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                                                   : <e9>
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## 'mbcsToSbcs'
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## 'mbcsToSbcs' ' '
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
                1 1
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
                1 1
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## 'mbcsToSbcs' ' ' : <bc>
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## 'mbcsToSbcs' ' '
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## 'mbcsToSbcs'
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## 'mbcsToSbcs'
                                 1 1
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## 'mbcsToSbcs'
                                 1 1
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## 'mbcsToSbcs'
                                 1 1
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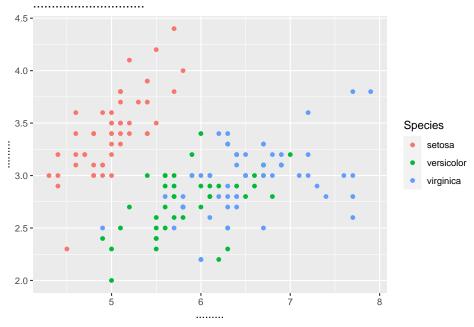
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ggplot