

R

Toshikazu Masumura

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1 ggplot2

1.1 R

- base(graphics)
- lattice
- grid
- ggplot2

1.2 ggplot2

ggplot2 tidy data

1.3 ggplot2

1 plot facet
magrittr %\$% %T%

ggplot2

ggpubr

1.4 ggplot2

iris vegan dave tidy data

aesthetics

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

1.5 facet

for subset dplyr::filter

1.6 ggsave

1.7 (windows)

1.8 theme

1.9

- ggplot2
- ggplot2
- unwin GDA
-

2 magrritr

2.1 tidyverse magrittr

tidyverse R R tidyverse tidyverse 1

```
library(tidyverse)
```

```
## -- Attaching packages ----- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.6      v purrr   0.3.4
## v tibble  3.1.8      v dplyr  1.0.10
## v tidyr   1.2.1      v stringr 1.4.1
## v readr   2.1.2      v forcats 0.5.1
```

```
## -- Conflicts ----- tidyverse_conflicts() --
```

```
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
```

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

```
tidyverse      1      tibble
```

2.2 %>%

%>%

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

```

tidyverse      magrittr
library(magrittr)

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

```

2.3 %<>%

2.3.1

%<>%

```

mpg #

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

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

```

```

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

```

```
## # ... with 107 more rows, and abbreviated variable name 1: manufacturer
```

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

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

2.3.2

2.4 %T>%

2.4.1

```
mpg #
```

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

2.4.2

```
<- <<-
```

2.5 %\$%

2.5.1

2.5.2