

Facets (ggplot2)

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Problem

You want to do split up your data by one or more variables and plot the subsets of data together.

Solution

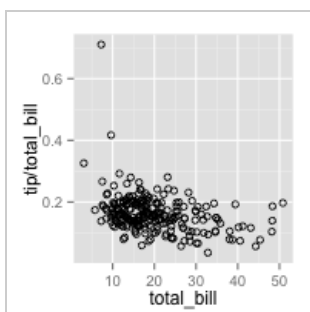
Sample data

We will use the `tips` dataset from the `reshape2` package.

```
library(reshape2)
# Look at first few rows
head(tips)
#>   total_bill tip  sex smoker day  time size
#> 1    16.99  1.01 Female   No Sun  Dinner    2
#> 2    10.34  1.66  Male   No Sun  Dinner    3
#> 3    21.01  3.50  Male   No Sun  Dinner    3
#> 4    23.68  3.31  Male   No Sun  Dinner    2
#> 5    24.59  3.61 Female   No Sun  Dinner    4
#> 6    25.29  4.71  Male   No Sun  Dinner    4
```

This is a scatterplot of the tip percentage by total bill size.

```
library(ggplot2)
sp <- ggplot(tips, aes(x=total_bill, y=tip/total_bill)) + geom_point(shape=1)
sp
```

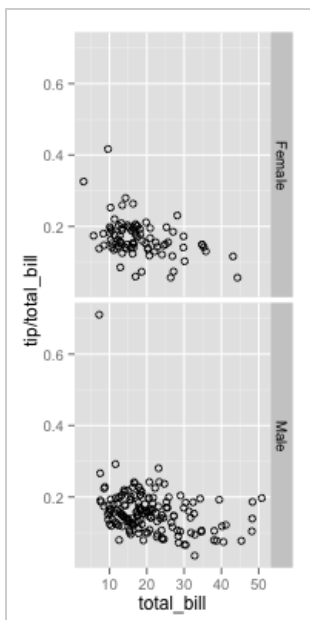


facet_grid

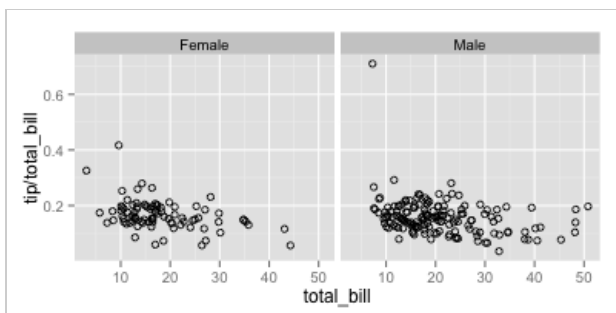
The data can be split up by one or two variables that vary on the horizontal and/or vertical direction.

This is done by giving a formula to `facet_grid()`, of the form `vertical ~ horizontal`.

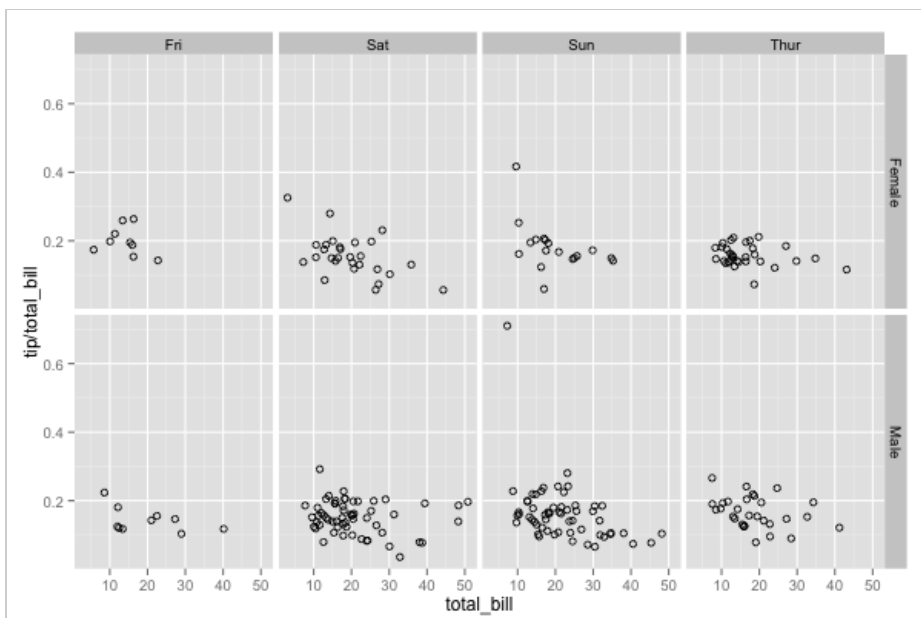
```
# Divide by levels of "sex", in the vertical direction
sp + facet_grid(sex ~ .)
```



```
# Divide by levels of "sex", in the horizontal direction
sp + facet_grid(. ~ sex)
```



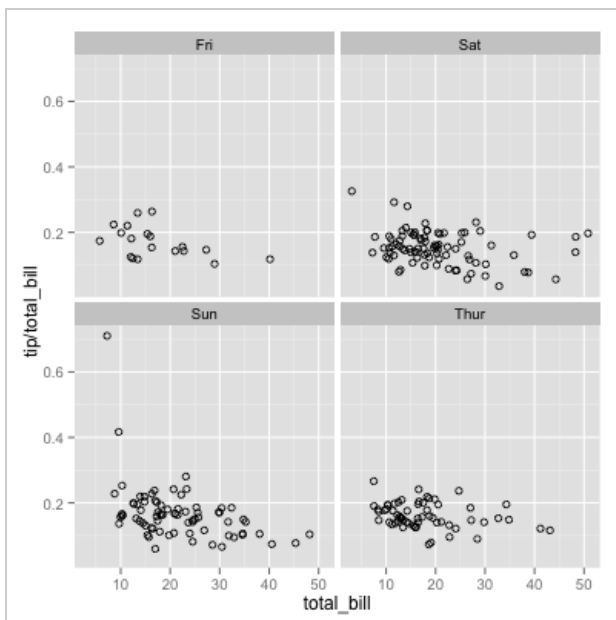
```
# Divide with "sex" vertical, "day" horizontal
sp + facet_grid(sex ~ day)
```



facet_wrap

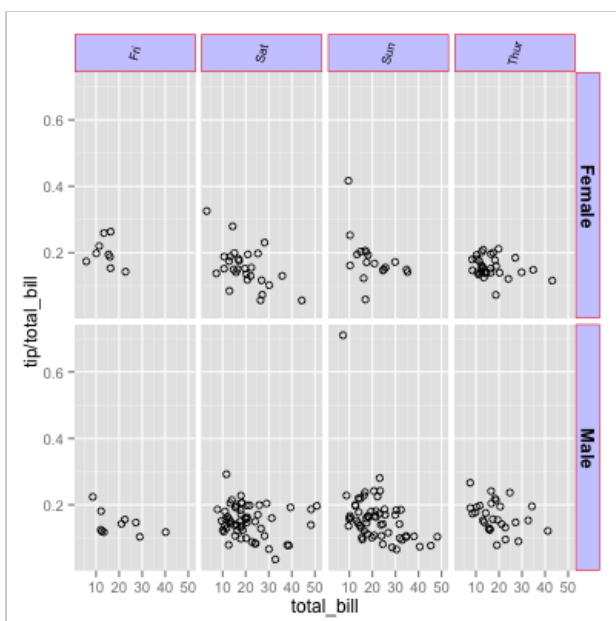
Instead of faceting with a variable in the horizontal or vertical direction, facets can be placed next to each other, wrapping with a certain number of columns or rows. The label for each plot will be at the top of the plot.

```
# Divide by day, going horizontally and wrapping with 2 columns
sp + facet_wrap(~ day, ncol=2)
```



Modifying facet label appearance

```
sp + facet_grid(sex ~ day) +
  theme(strip.text.x = element_text(size=8, angle=75),
        strip.text.y = element_text(size=12, face="bold"),
        strip.background = element_rect(colour="red", fill="#CCCCFF"))
```



Modifying facet label text

Modifying the text of a facet label is somewhat complex. It is necessary to either (A) create a function which maps the original names to the new names, or (B) change the data frame.

To create a function which maps the levels of `sex` from `Female==>Woman`, and `Male==>Man`:

```
mf_labeller <- function(var, value){
  value <- as.character(value)
  if (var=="sex"){
    value[value=="Female"] <- "Woman"
    value[value=="Male"] <- "Man"
  }
  return(value)
}

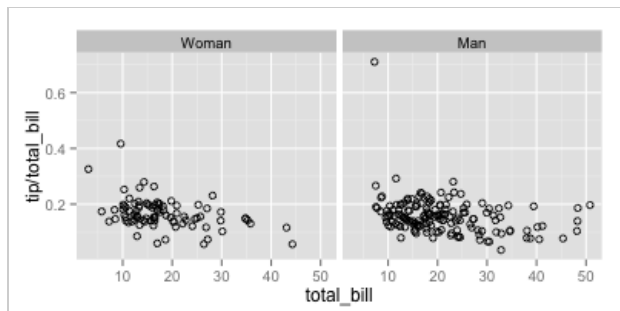
sp + facet_grid(. ~ sex, labeller=mf_labeller)
```

To change the data frame:

```
tips2 <- tips
levels(tips2$sex)[levels(tips2$sex)=="Female"] <- "Woman"
levels(tips2$sex)[levels(tips2$sex)=="Male"] <- "Man"
head(tips2, 3)
#>   total_bill tip  sex smoker day  time size
#> 1    16.99 1.01 Woman   No Sun  Dinner   2
#> 2    10.34 1.66  Man   No Sun  Dinner   3
#> 3    21.01 3.50  Man   No Sun  Dinner   3

# Both of these will give the same output:
sp2 <- ggplot(tips2, aes(x=total_bill, y=tip/total_bill)) + geom_point(shape=1)
sp2 + facet_grid(. ~ sex)
```

Both of these will give the same result:



Free scales

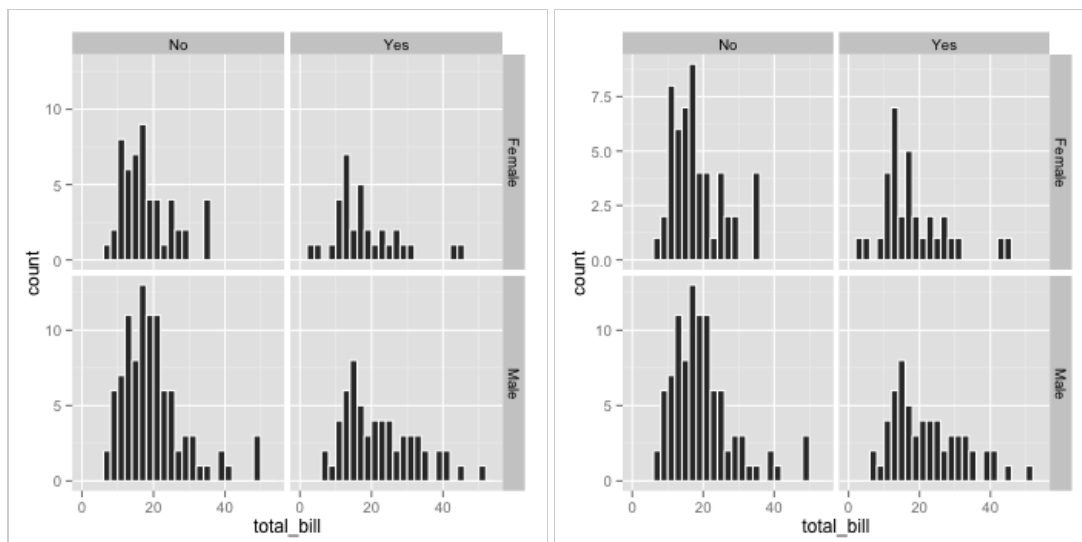
Normally, the axis scales on each graph are **fixed**, which means that they have the same size and range. They can be made independent, by setting scales to `free`, `free_x`, or `free_y`.

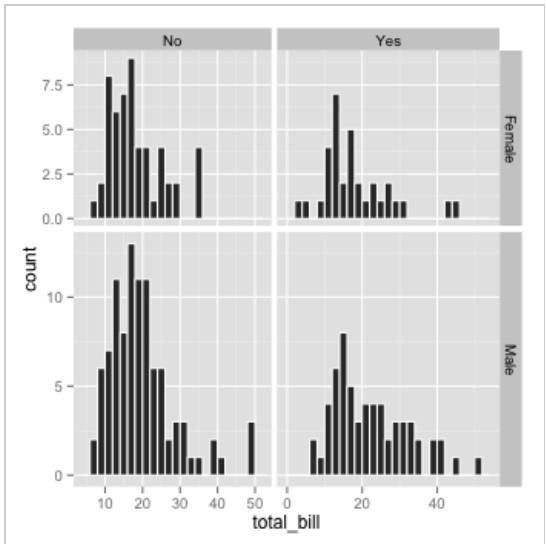
```
# A histogram of bill sizes
hp <- ggplot(tips, aes(x=total_bill)) + geom_histogram(binwidth=2, colour="white")

# Histogram of total_bill, divided by sex and smoker
hp + facet_grid(sex ~ smoker)

# Same as above, with scales="free_y"
hp + facet_grid(sex ~ smoker, scales="free_y")

# With panels that have the same scaling, but different range (and therefore different physical sizes)
hp + facet_grid(sex ~ smoker, scales="free", space="free")
```





Cookbook for R

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