



More on Advanced Graphics

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In this session, you will be learned:

- How to use facets to produce multiple panels in same plot
- How to use themes to control the appearance of a plot.

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Facets

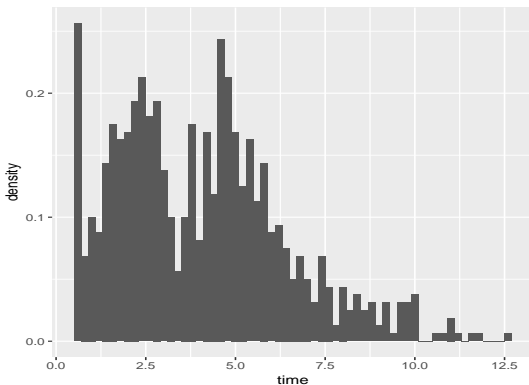
Facets

- Faceting is a mechanism for automatically laying out multiple plots on a page.
- The data is split into subsets, each subset onto a different panel.
- `ggplot2` has two types of faceting:
 - `facet_grid`: produces a 2d panel of plots where variables define rows and columns.
 - `facet_wrap`: produces a 1d ribbon of panels which can be wrapped into 2d.

Facet grid

Suppose we are interested in time to relief from the `med` data set. A first plot we could generate is a basic histogram:

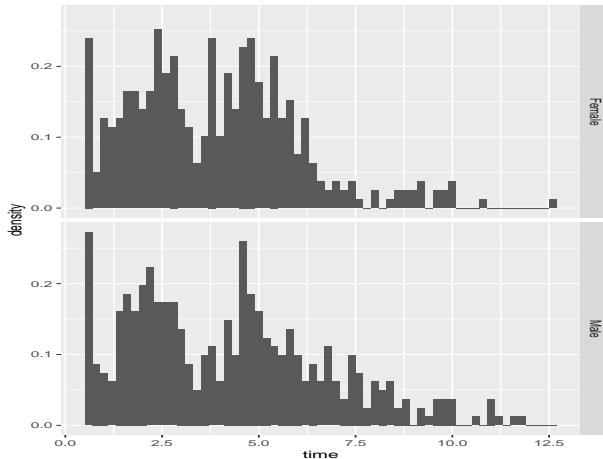
```
g = ggplot(med, aes(x=time)) +  
  geom_histogram(aes(y=..density..), binwidth=0.2)
```



Facet grid

We will now use faceting to explore the data further:

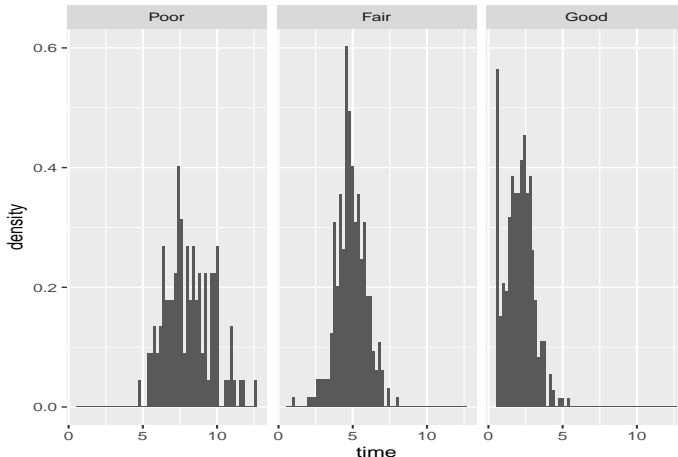
```
g + facet_grid(gender ~ .)
```



Facet grid

We could also split data by health condition in columns:

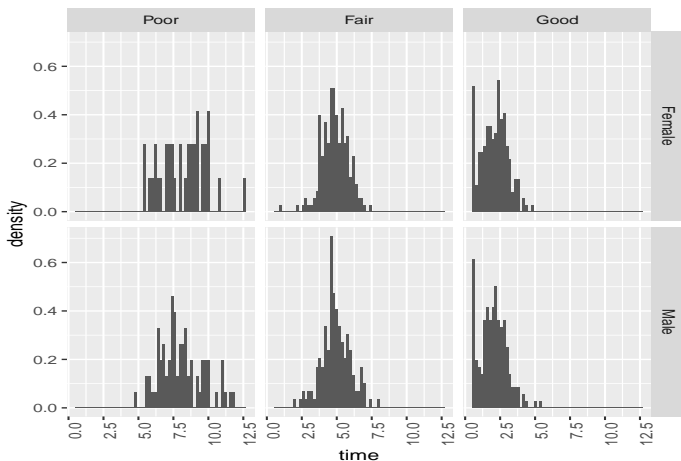
```
g + facet_grid(. ~ health) + scale_x_continuous(breaks =  
c(0, 5, 10))
```



Facet grid

Both rows and columns can be used to split data by:

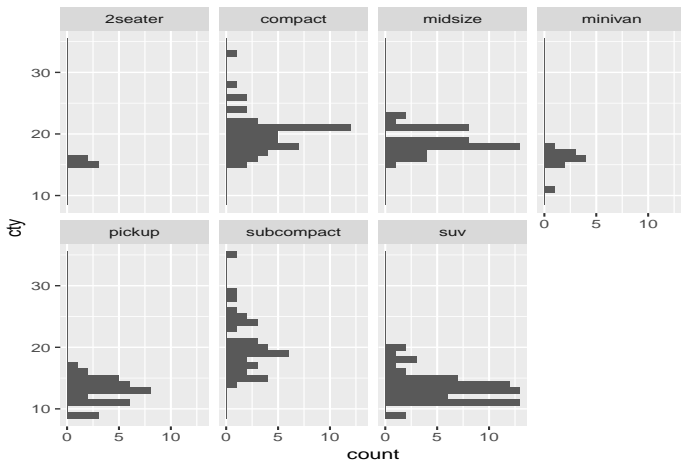
```
g + facet_grid(gender ~ health) + theme(axis.text.x =  
element_text(angle = 90, hjust = 1))
```



Facet wrap

The `facet_wrap` function creates a 1d ribbon of plots:

```
ggplot(mpg, aes(x=cty)) + geom_histogram(binwidth=1) +  
facet_wrap(~class, ncol=4) + coord_flip()
```



Themes

What are themes?

Themes are used in `ggplot2` to ease making consistent changes to all your plots. For example:

- change the font size;
- change background colour;
- control angles of axis label.
- etc.

Choice of themes

A few useful standard themes are available in the [ggthemes](#) package which can be loaded using:

```
require(ggthemes)
```

Once loaded, a range of standard themes would be available to control the plot appearance:

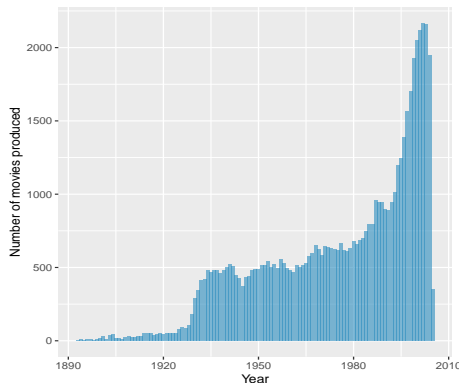
- `theme_bw()`
- `theme_economist()`
- `theme_stata()` - useful for stata users
- `theme_pander()`
- `theme_hc(style = "darkunica")`

Theme examples

I will use the `movies` data from the `ggplot2movies` to show few examples of standard themes:

```
data(movies, package="ggplot2movies")
```

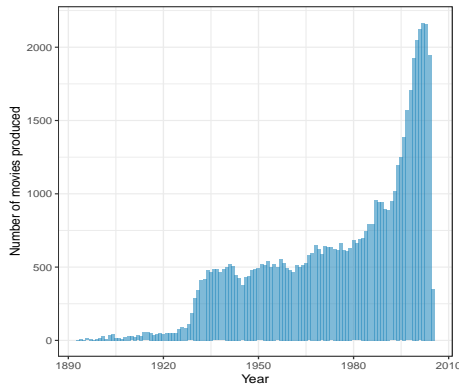
```
(h=  
ggplot(movies, aes(year))+  
geom_histogram(binwidth=1,  
fill="#2b8cbe",alpha=0.6)+  
xlab("Year")+ylab("Number  
of movies produced"))
```



Theme examples

Using the `theme_bw()`, the appearance can be changed to:

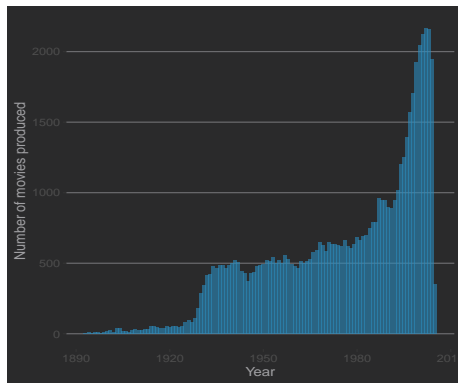
```
h + theme_bw()
```



Theme examples

Using the `theme_hc(style = "darkunica")`, the appearance can be changed to:

```
h + theme_hc(style =  
"darkunica")
```



Define our own theme

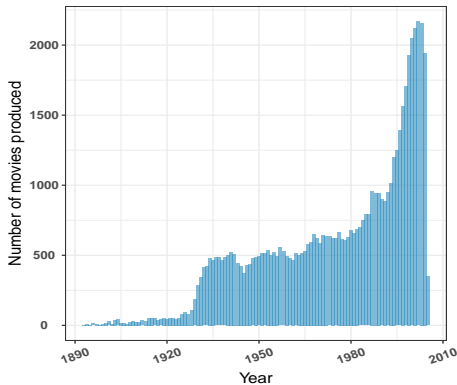
We can setup our own theme:

```
My_theme <-  
theme(axis.text=element_text(size=10, face="bold"),  
axis.text.x=element_text(angle=20, vjust=0.5),  
axis.text.y=element_text(vjust=0.5, hjust = 0.5),  
plot.margin = unit(c(0.5,0.5,0.5,0.5), "cm"),  
axis.title=element_text(size = rel(1.2)),  
axis.title.x=element_text(vjust=-0.5),  
axis.title.y=element_text(vjust=1.5))
```

Define our own theme

Then, we can use it using:

```
h + theme_bw() + My_theme
```



Useful links

ggplot2

RStudio blog on ggplot2:

<https://blog.rstudio.com/2016/11/14/ggplot2-2-2-0/>

ggplot2 cheat sheet

Data Visualisation with ggplot2 Cheat sheet

<https://rstudio.com/wp-content/uploads/2015/03/ggplot2-cheatsheet.pdf>

Thank You