Lattice Functions

- `xyplot`: this is the main function for creating scatterplots
- `bwplot`: box-and-whiskers plots (“boxplots”)
- `histogram`: histograms
- `stripplot`: like a boxplot but with actual points
- `dotplot`: plot dots on “violin strings”
- `splom`: scatterplot matrix; like `pairs` in base graphics system
- `levelplot`, `contourplot`: for plotting “image” data

Lattice Functions

Lattice functions generally take a formula for their first argument, usually of the form

```
y ~ x | f * g
```

- On the left of the ~ is the y variable, on the right is the x variable
- After the | are *conditioning variables* — they are optional; the * indicates an interaction
- The second argument is the data frame or list from which the variables in the formula should be obtained.
- If no data frame or list is passed, then the parent frame is used.
- If no other arguments are passed, there are defaults that can be used.

Lattice Behavior

Lattice functions behave differently from base graphics functions in one critical way.

- Base graphics functions plot data directly the graphics device
- Lattice graphics functions return an object of class `trellis`.
- The print methods for lattice functions actually do the work of plotting the data on the graphics device.
- Lattice functions return "plot objects" that can, in principle, be stored (but it's usually better to just save the code + data).
- On the command line, `trellis` objects are *auto-printed* so that it appears the function is plotting the data

Lattice Panel Functions

Lattice functions have a `panel` function which controls what happens inside each panel of the entire plot.

```
x <- rnorm(100)
y <- x + rnorm(100, sd = 0.5)
f <- gl(2, 50, labels = c("Group 1", "Group 2"))
xyplot(y ~ x | f)
```

plots y vs. x conditioned on f.

Lattice Panel Functions

```
xyplot(y ~ x | f,
       panel = function(x, y, ...) {
               panel.xyplot(x, y, ...)
               panel.abline(h = median(y),
                            lty = 2)
       })
```

plots y vs. x conditioned on f with horizontal (dashed) line drawn at the median of y for each panel.

Lattice Panel Functions

Adding a regression line

```
xyplot(y ~ x | f,
       panel = function(x, y, ...) {
               panel.xyplot(x, y, ...)
               panel.lmline(x, y, col = 2)
       })
```

fits and plots a simple linear regression line to each panel of the plot.