

Graphical Exploration of Data in R

Ken Mwai and Greg Fegan

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Why use graphics in data Analysis?

- To understand data properties
- To communicate results

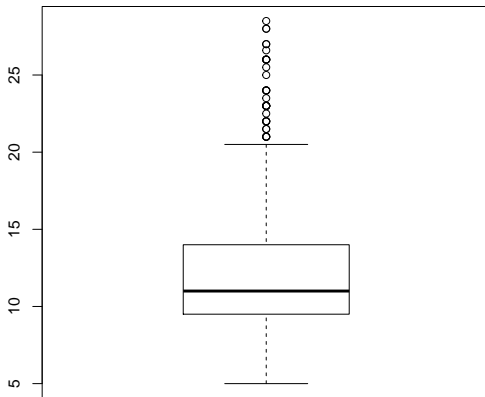
Graphs of single quantitative variables

- **Box(-whisker)plot**

It is suitable for skewed data, where it may not be correct to show mean and standard deviations.

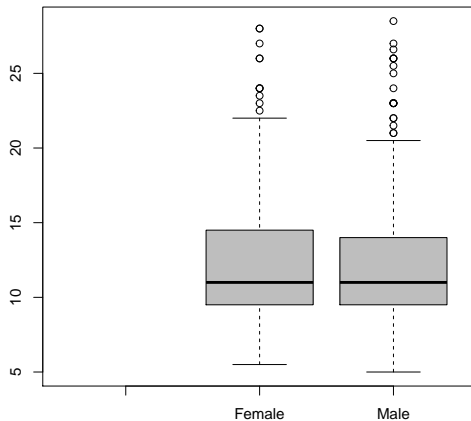
Boxplots

```
> boxplot(maltreat$weight)
```



Boxplots

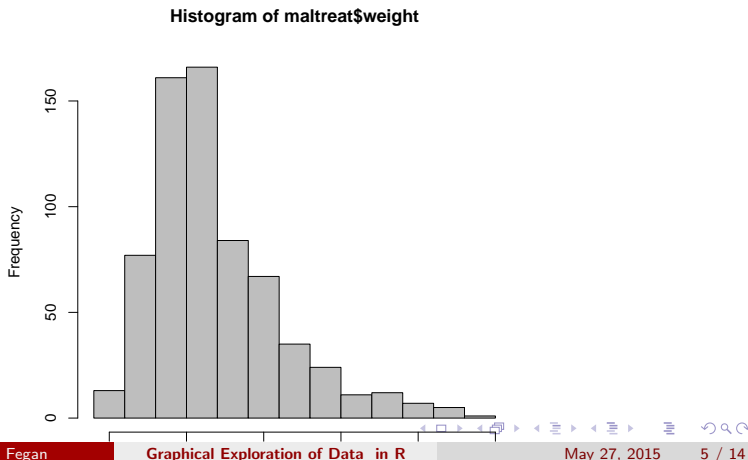
```
> boxplot(maltreat$weight~maltreat$sex,col="grey")
```



Histograms

Explore the assumption of normality.

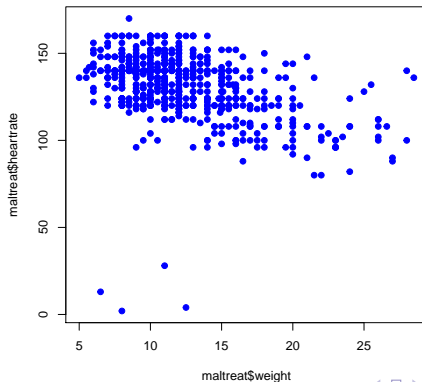
```
> hist(maltreat$weight, col="grey")
```



Scatterplots

- Visualize relationship between two quantitative variables.

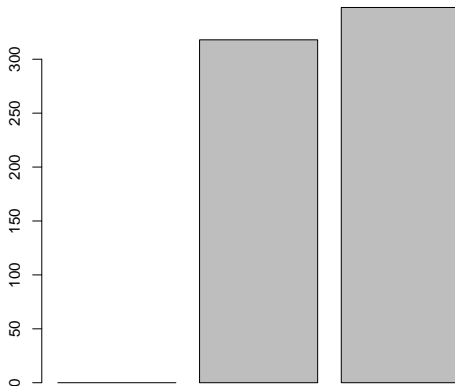
```
> plot(maltreat$weight, maltreat$heartrate, pch=19, col="blue")
```



Graphs on single qualitative variables

- Bar plots

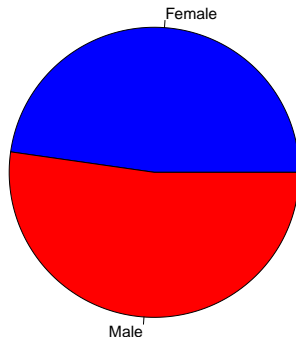
```
> barplot(table(maltreat$sex))
```



Pie charts

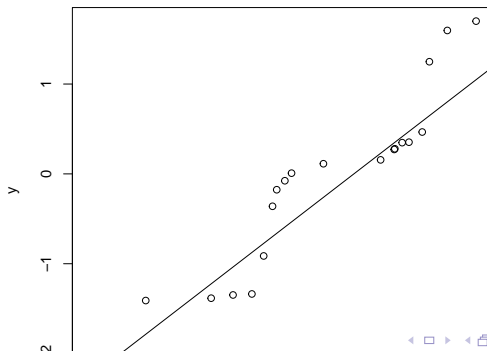
```
> pie(table(maltreat$sex), col=c("red","blue"),main="Pie chart")
```

Pie chart of gender



QQ Plots

```
> x<-rnorm(20)
> y<-rnorm(20)
> qqplot(x,y)
> abline(c(0,1))
```



Graphical workflow

Graphical workflow

- Start with a rough plot

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- Tweak it to make it expository

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- Save the file

Graphical workflow

- Start with a rough plot
- Tweak it to make it expository
- Save the file
- Include it in presentations/manuscript

Useful Graphical Parameters

par function gives the parameters for the plot window.

- **pch**: the plotting symbol (default is open circle)
- **lty**: the line type (default is solid line), can be dashed, dotted, etc.
- **lwd**: the line width, specified as an integer multiple
- **col**: the plotting color, specified as a number, string, or hex code; the `colors` function gives you a vector of colors by name. `colors()` gives a list of all the available colours.
- **las**: the orientation of the axis labels on the plot

Useful Graphical Parameters

- `bg`: the background color
- `mar`: the margin size
- `mtext`: add arbitrary text to the margins (inner or outer) of the plot
- `mfrow`: number of plots per row, column (plots are filled row-wise)
- `mfcop`: number of plots per row, column (plots are filled column-wise)

Other Graphical Packages

- Lattice
- ggplot2
- More ggplot2
- rcharts
- Plotly

Resources

R graph gallery

Cookbook for R

How to display data badly