VISUALISING DATA: INTERACTIVE REPORTS WITH KNITR

National Workshop
Accra, Ghana
Outline

1. Report writing with interactive graphs
2. Application to the HIES data
1. Report writing with interactive graphs
Data analysis reports

- Figures/tables
- Static Word document
- `knitr + Markdown → Web page`
• What if the data change?
• What if you used the wrong version of the data?
• **Input to knitr:**

We see that this is an intercross with \`\r nind(sug)` individuals. There are \`\r nphe(sug)` phenotypes, and genotype data at \`\r totmar(sug)` markers across the \`\r nchr(sug)` autosomes. The genotype data is quite complete.

```{r summary_plot, fig.height=8}
plot(sug)
```

• **Output from knitr:**

We see that this is an intercross with 163 individuals. There are 6 phenotypes, and genotype data at 93 markers across the 19 autosomes. The genotype data is quite complete.

```r
plot(sug)
```

![plot of chunk summary_plot](RmdFigs/summary_plot.png)
<!DOCTYPE html>
<html>
<head>
<meta charset=\"utf-8\"/>
<title>Example html file</title>
</head>

<body>
<h1>Markdown example</h1>
<p>Use a bit of <strong>bold</strong> or <em>itals</em>. Use backticks to indicate <code>code</code> that will be rendered in monospace.</p>
<ul>
<li>This is part of a list</li>
<li>another item</li>
</ul>
</body>
</html>
# Markdown example

Use a bit of **bold** or _italics_. Use backticks to indicate `code` that will be rendered in monospace.

- This is part of a list
- another item

Include blocks of code using three backticks:
``````
x <- rnorm(100)
```
```
Or indent four spaces:

mean(x)
sd(x)

And it's easy to create links, like to [Markdown](http://daringfireball.net/projects/markdown/).
R Markdown

• R Markdown is a variant of Markdown, developed at RStudio.com
• Markdown + knitr + extras
• A few extra marks
• LATEX equations
• Bundle images into the final html file
### Preliminaries

Load the R/qtl package using the `library` function:

```{r load_qtl}
library(qtl)
```

To get help on the read.cross function in R, type the following:

```{r help , eval=FALSE}
?read.cross
```
Chunk options

- `echo=FALSE` Don't include the code
- `results="hide"` Don't include the output
- `include=FALSE` Don't show code or output
- `eval=FALSE` Don't evaluate the code at all
- `warning=FALSE` Don't show R warnings
- `message=FALSE` Don't show R messages
- `fig.width=#` Width of figure
- `fig.height=#` Height of figure
- `fig.path="Figs/"` Path for figure files

There are lots of chunk options.
Global chunk options

```
```
```
```{r knitr_options, include=FALSE}
knitr::opts_chunk$set(fig.width=12, fig.height=4,
fig.path='Figs/', warning=FALSE,
message=FALSE, include=FALSE,
echo=FALSE)
set.seed (53079239)
```
```
```{r make_plot, fig.width=8, include=TRUE}
x <- rnorm (100)
y <- 2*x + rnorm (100)
plot(x, y)
```

• Use global chunk options rather than repeat the same options over and over.
• You can override the global values in specific chunks.
We see that this is an intercross with `r nind(sug)` individuals. There are `r nphe(sug)` phenotypes, and genotype data at `r totmar(sug)` markers across the `r nchr(sug)` autosomes. The genotype data is quite complete.

- Each bit of in-line code needs to be within one line; they can't span across lines.
- I'll often precede a paragraph with a code chunk with include=FALSE, defining various variables, to simplify the in-line code.
- Never hard-code a result or summary statistic again!
R Markdown -> html, in RStudio

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**title:** "knitr/R Markdown example"
**author:** "Karl Broman"
**date:** "28 January 2015"
**output:** html_document

---

This is a simple example using knitr and R markdown to mix code and text.

We'll start by setting the seed for the random number generator.

```r
set.seed(53079239)
```

---

`'citation()'` on how to cite R or R packages in publications.

Type `demo()` for some demos, `help()` for on-line help, or `help.start()` for an HTML browser interface to help.

Type `q()` to quit R.

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**Markdown Quick Reference**

R Markdown is an easy-to-write plain text format for creating dynamic documents and reports. See [Using R Markdown](#) to learn more.

**Emphasis**

- *italic*
- **bold**

**Headers**

- _italic_
- __bold__
2. Application to the HIES data
A worked example

- check folder: `\project\permanent\4_Report\`