Introduction to R

A Sample Rnw Document for use with RStudio

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1 Creating an Rnw File

R R Core Team (2014) code can be included in an existing LaTeX document by changing the name of the file from myfilename.tex to myfilename.Rnw and opening the Rnw file in RStudio. Alternatively, use File → New File → R Sweave and fill in the template.

R code can be embedded in your LaTeX document in a very similar way to the way it is done in R Markdown. An R chunk starts with `<<>>=` and ends with `@`. Here is an example:

```
pi

## [1] 3.141593
```

and another:

```
x <- rnorm(5)
x

## [1]  0.5360421 -1.4816438  0.3806697  1.1416327 -1.7500935
```

```
xbar <- mean(x)
xbar

## [1] -0.2346786
```

We can put options in the `<<>>` (here `<<echo=FALSE>>`):

```
## [1] -0.2346786
```

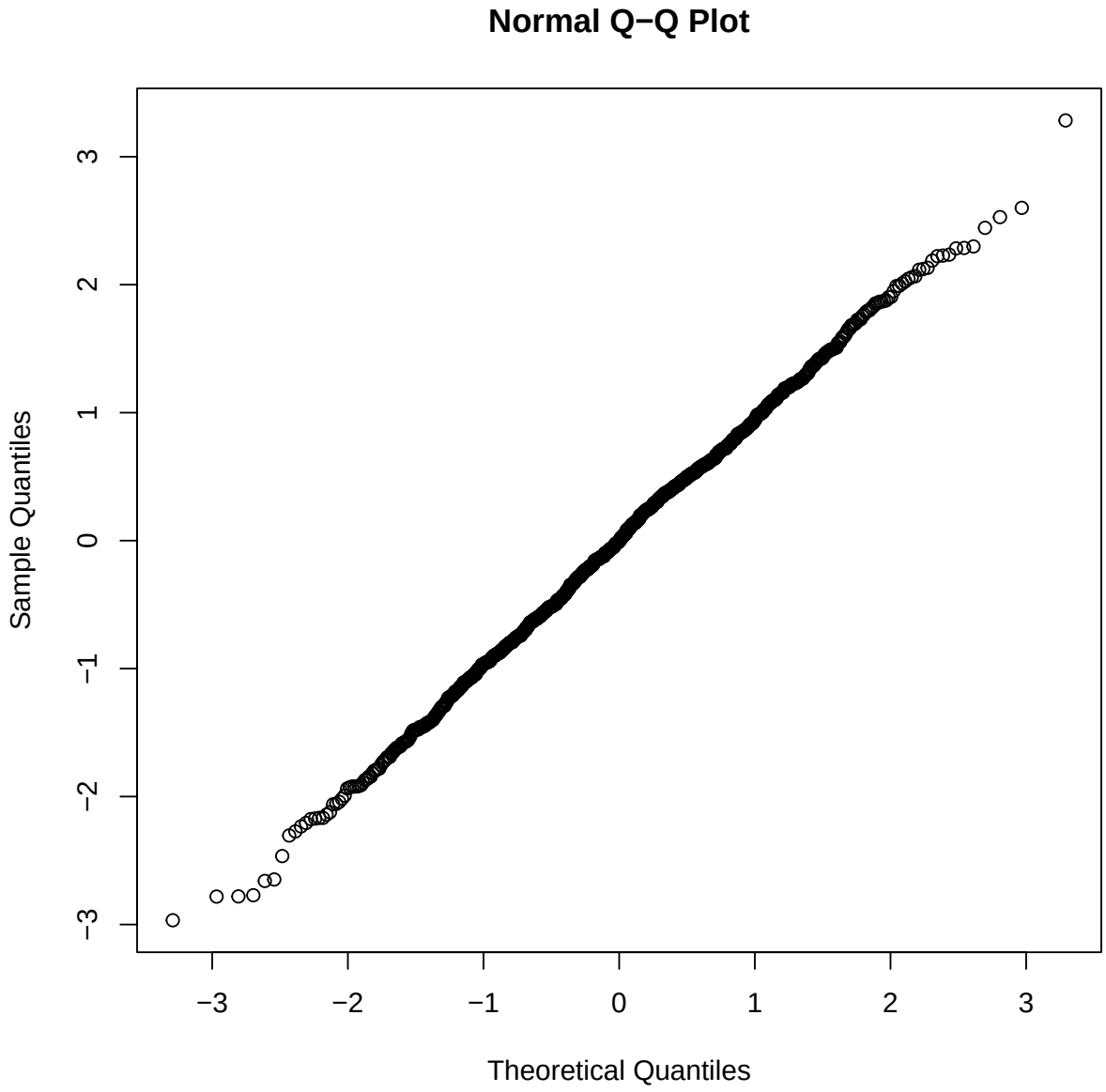
and we can set options that will last for the rest of the document using `opts_chunk$set()`:

```
opts_chunk$set(prompt=TRUE)
```

```
> xbar <- mean(x)
> xbar
```

We can draw plots:

```
> qqnorm(rnorm(1000))
```


Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
−3
−2
−1
0
1
2
3

2 Multiple Code Chunks

We can create multiple code chunks and then only evaluate them later on (look at the Rnw source code to see what happens here):

```
> x <- 10
> y <- 20
> x + y

## [1] 30
```

3 Citations and References

By the way, LaTeX helps you with references and citations via a bibtex (.bib) file. Once a reference has been entered into such a file, you can just cite it. Below are some examples:

- Here a citation "as noun": Lamport (1985) is a main reference for LaTeX.
- Here a citation in parentheses: Several sources for help with knitr exist (Xie 2013).
- You can combine multiple references: These references (Breiman 1984, 1996, 2001) likely will be used in some of Adele Cutler's courses.

Note that the reference list is created automatically! The file "agsm.bst" determines the appearance of the references. Most publishers and journals provide their own bst file so the references will appear immediately in the proper book or journal style.

References

Breiman, L. (1984), *Classification and regression trees*, Chapman & Hall/CRC.

Breiman, L. (1996), 'Bagging predictors', *Machine learning* .
URL: *http://www.springerlink.com/index/L4780124W2874025.pdf*

Breiman, L. (2001), 'Random forests', *Machine learning* .
URL: *http://www.springerlink.com/index/u0p06167n6173512.pdf*

Lamport, L. (1985), *LaTeX A Document Preparation System*.

R Core Team (2014), *R: A Language and Environment for Statistical Computing*, R Foundation for Statistical Computing, Vienna, Austria.
URL: *http://www.R-project.org/*

Xie, Y. (2013), *knitr: A general-purpose package for dynamic report generation in R*. R package version 1.4.1.
URL: *http://yihui.name/knitr/*