Estimation theory – report template

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October 16, 2017

Contents

1 Exercise 1

In order to include R code chunk use the following syntax:

```
# random sample from standard normal distribution
X <- rnorm(100)

# summary statistics
summary(X)

##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## -2.50700 -0.64010  0.06037  0.05680  0.70220  2.15400
```

Remark: To display the output of a code chunk but not the underlying R code, you specify the echo=FALSE option.

2 Exercise 2

R code chunks can be used to create plots dynamically too. For example, to obtain histogram write:

```
hist(X, main="Histogram")
```

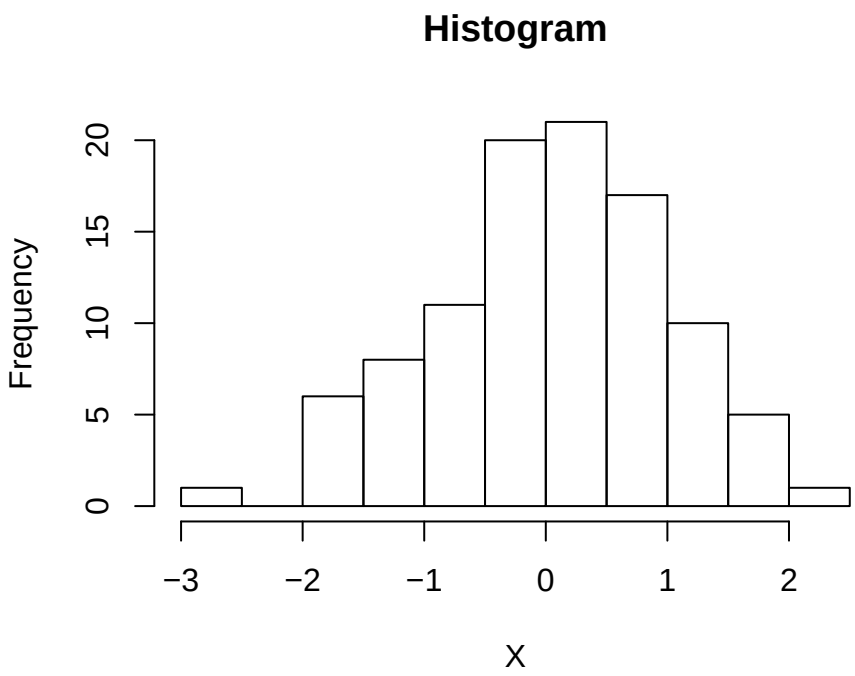

Figure 1: Add caption here

Note that one can easily add reference to the generated figures. For example: Figure 1 shows histogram.

Creating nice looking tables is not much more difficult. For this purpose you can use function *xtable()*. Here is a small example:

	1	2	3	4	5
1	0.319	-0.317	0.185	0.432	0.400
2	1.763	1.779	-0.665	-0.142	-0.956
3	0.652	0.206	-0.394	-0.907	-1.288
4	-0.731	-1.508	-0.134	-0.306	-0.226

Table 1: Add caption here

You can add a reference to our table 1 too.

3 Exercise 3

If needed (e.g. when answering theoretical problems etc.), use LaTeX syntax to add mathematical formulas. For example, inline (within text) formulas can be included using: $a^2 + b^2 = c^2$. On the other hand, displayed equations can be added as follows:

$$\overline{X} = \frac{1}{n} \sum_{i=1}^{n} X_i, \tag{1}$$

where n denotes sample size.

4 Exercise 4

A few final suggestions:

- The results of simulations or analysis should be presented in a clear format.
- When you plot the graphs, remember about axis descriptions, setting appropriate axis limits (e.g: `plot (..., xlim = c (x.min, x.max), ylim = c (y.min, y.max)`), adding legend (necessary when there are several lines in the graph), and adding a caption under the graph or table.
- If possible try to show the results in a condensed form (e.g. comparing several charts in one figure, comparing the results in a single table, etc.).
- It is worth to consider whether all R-codes should be visible in the report (option `echo = TRUE / FALSE`).
- Remember to carefully format the R-codes and write appropriate comments (also in the case of chunks that are invisible in the report. You can use the following option available in RStudio: $Code \rightarrow Reformate\ Code$.

When using additional source materials (books, links, etc.) do not forget to include appropriate references. For example, let us assume we want to cite Dalgard (2008). Then the bibliography section should contain:

References

[1] Peter Dalgaard, *Introductory Statistics with R*, Springer-Verlag New York, 2008.