Demo Session

Arni Magnusson

Outline

Import
get data into R

Explore
plot and summarize

Analyze
fit a regression model

Export
save results to include in a report

Philosophy
repeatable and scalable

Save spreadsheet as text file

Download `cars.xls` and open in Excel / LibreOffice

Save as `cars.txt` (tab-separated) and view in editor

Organize project with separate directories:

```
cars
    analysis
    data
    report
```

Write the analysis as a script

Create empty script `analysis/cars.R`

Type commands in the same order as they need to be run

Annotate with comments to describe what each block of code does

Try to write the script so it will run on any computer, starting with input and ending with output

Read text file into R

Use relative paths:

```
cars <- read.table("../data/cars.txt", header=TRUE)
```

Check if data look OK

```
cars
```

```
head(cars)
```

Scatterplot

```
plot(cars$speed, cars$dist)
```

Range, median, mean, etc.

```
summary(cars)
```

Fit linear regression model

```
cars.lm <- lm(dist ~ speed, data=cars)

abline(cars.lm)
```

Paste model summary

```
summary(cars.lm)
```

Copy from R and paste into Word/ LibreOffice document

Write plot to PNG file

```
png("../report/cars.png")

plot(dist ~ speed, data=cars)

abline(cars.lm)

dev.off()
```

Insert cars.png into document

Clean up script

Delete all unnecessary lines

Add comments, if needed

Make sure the whole script runs without errors

Repeatable analysis

If you send the data files and script to colleagues,
they can repeat the analysis

- ▶ foundation of the scientific method

Easy to make changes and rerun the entire analysis

- add one year of data
- explore different modelling choices
- respond to a reviewer's comment

Easy to repeat the analysis for many datasets

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