Introduction to ${\sf R}$

Demo session

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- Explore plot and summarize
- 3 Analyze fit a regression model
- Export embed results into a report
- 5 Philosophy repeatable and scalable

Data in text files Read into R Check data

Outline

Import - get data into R

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Data in text files Read into R Check data

Save spreadsheet as text file

Download cars.xls and open in Excel/OpenOffice

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

Import Explore Analyze Export

Philosophy

Data in text file Read into R Check data

Read text file into R

Open R and type:

read.table("c:/shop/cars.txt", header=T)

cars <- read.table("c:/shop/cars.txt", header=T)</pre>

Import

Explore Analyze Export Philosophy Data in text file Read into R Check data

Check if data look OK

cars

head(cars)

Plot data Summarize

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Plot data Summarize

Scatterplot

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

Explore Analyze Export hilosophy

Plot data Summarize

Range, median, mean, etc.

summary(cars)

	Import Explore Analyze Export Philosophy	Fit model	
outline			



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Fit model

Fit linear regression model

cars.lm <- lm(dist ~ speed, data=cars)</pre>

abline(cars.lm)

Save results Save plot Save script

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Save results Save plot Save script

Paste model summary

summary(cars.lm)

Copy from R and paste into Word/OpenOffice document

Save results Save plot Save script

Write plot to PNG file

```
png("c:/shop/cars.png")
```

```
plot(dist \sim speed, data=cars)
```

```
abline(cars.lm)
```

```
dev.off()
```

Insert cars.png into document

Save results Save plot Save script

Save command history

history()

Save the command history as cars.R

To make this a proper script, you could:

- delete all unnecessary lines
- add comments
- make sure the whole script runs without errors

Repeatability and scalability

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Repeatability and scalability

Repeatable analysis

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

• foundation of the scientific method

Easy to make changes and redo 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