Session 1: General Introduction

Welcome

- Today we will...
  - Briefly introduce the world of probability and statistics and our course's place in it.
  - Show the R statistical language interface.
  - Go over the usual module administration details.

Quotes

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Without data you are just another person with an opinion

– Unknown

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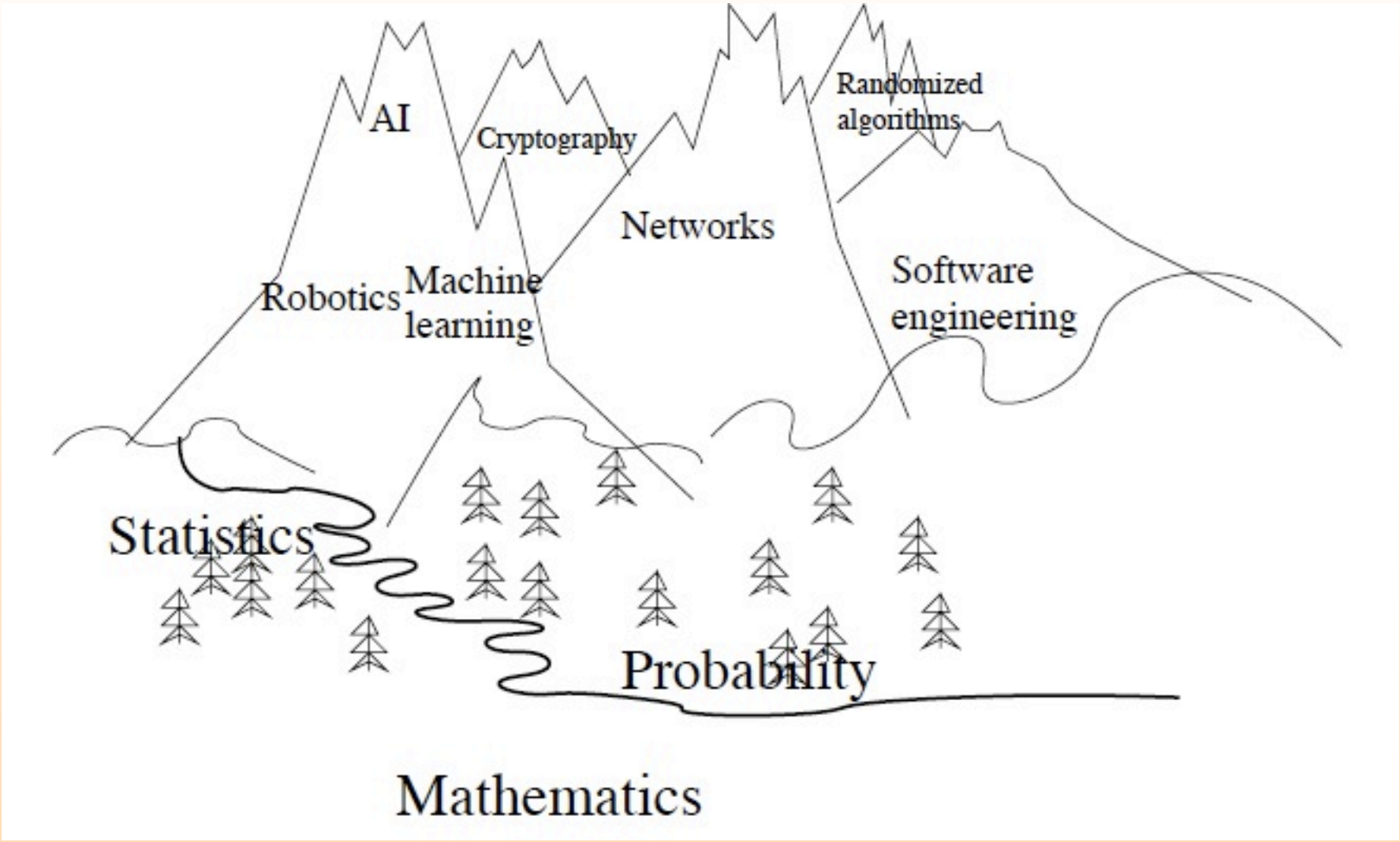
- Encountering Probability and Statistics for the first time simultaneously appeals to, and challenges, our intuition about uncertainty, variability and "noise";
  - actually this intuition is already well developed in us to begin with ("common sense"), the problem is that earlier deterministic maths training ruins it.


AI
Cryptography
Randomized
algorithms
Networks
Robotics
Machine
learning
Software
engineering
Statistics
Probability
Mathematics

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- Its validity depends crucially on the process of sampling.

Schematic View of the Scientific Method

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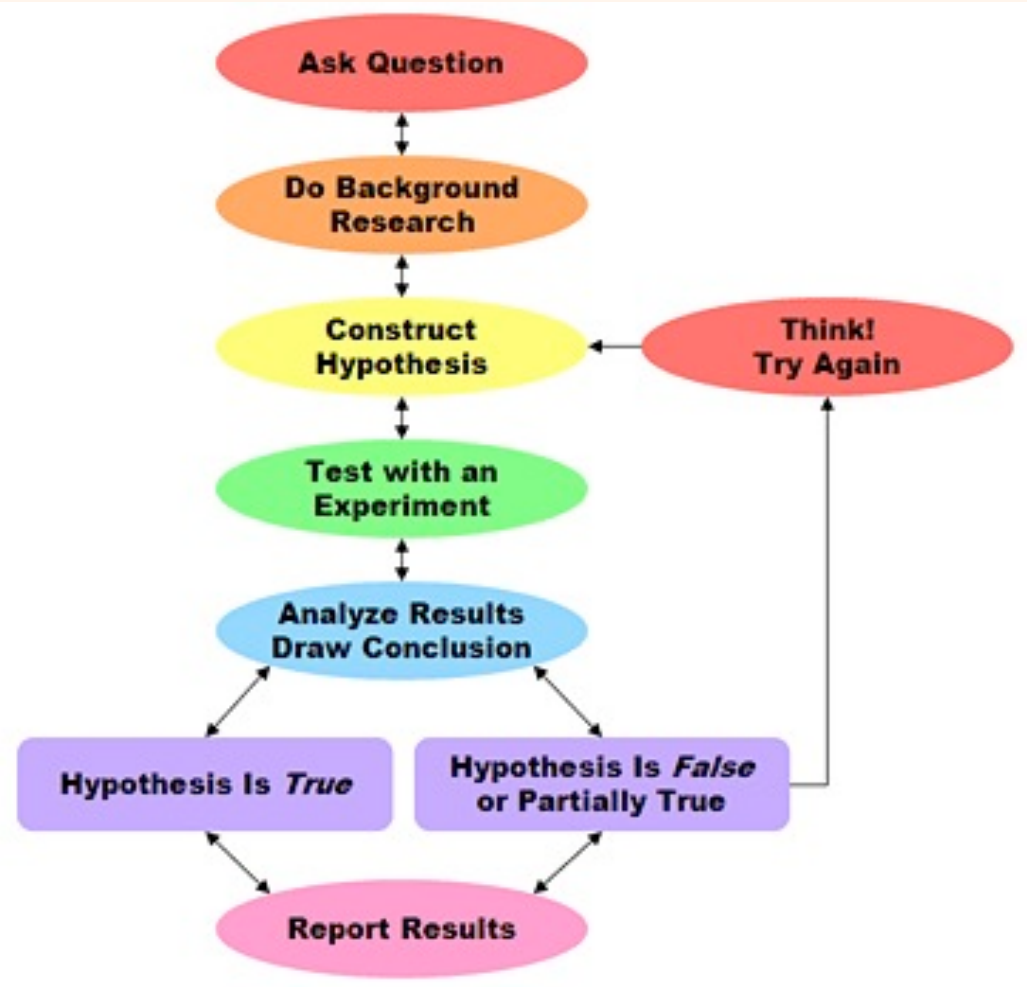

Statistics

Statistics is the science which deals with the collection, presentation, analysis and interpretation of data, as well as prescribing how best to draw valid conclusions and make reasonable decisions on the basis of such data, quantifying uncertainty in data and scientific inferences alike.

Statistics is the science of summary !!

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  - today's data structures are highly complex.
- Modern "Statistics" has more in common with "**Computer Science**" than "Mathematics".
- The links between "Statistics" and "Mathematics" are in essence, historical, although in practice many of the organizational links still remain.

The Future of Statistics by Bradley Efron

"My own life as a consulting biostatistician has been revolutionized in the space of a single career. Sitting in front of a powerful terminal and calling up R functions to all the dozen advances and a lot more really does put seven-league boots on a statistician's feet.

Maybe 77-league boots lie in our immediate future... "

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- An open source implementation of the S language (a language for manipulating data objects)
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- A platform for the development and implementation of new algorithms and hence for technology transfer
- Software (and add-on packages) can be downloaded from www.cran.r-project.org

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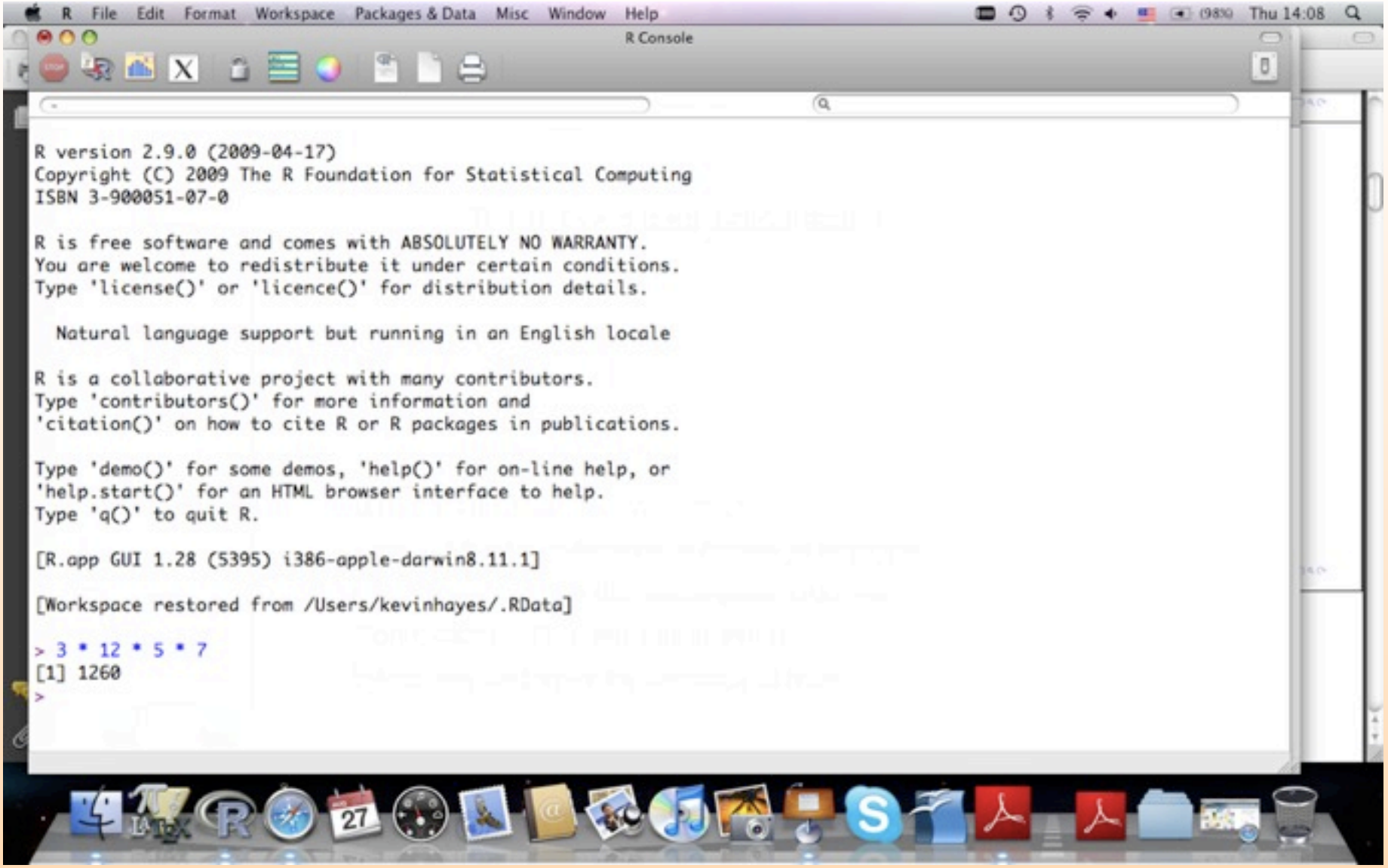
  www.cran.r-project.org
- Click on

  Windows > base > R-version-win32.exe > Run

  and follow the instructions.


R File Edit Format Workspace Packages & Data Misc Window Help
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R Console
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R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'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.
[R.app GUI 1.28 (5395) i386-apple-darwin8.11.1]
[Workspace restored from /Users/kevinhayes/.RData]
> 3 * 12 * 5 * 7
[1] 1260
>

TEXTBOOK

- 'Using R for Introductory Statistics' by John Verzani. Chapman & Hall, (2005).

Points of Contact

- Your tutors, during your tutorials.
- Kevin Hayes: immediately after lectures or during office hours B2040, Mondays, 10h00 to 11:00.
- Avoid emails when you can.

Course Assessment

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- Project 33%. Available, Monday 19 October 2009. Due, Monday 26 October 2009. Week 8.

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- Project 33%. Available, Monday 16 November 2009. Due, Monday 23 November 2009. Week 12.

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- There will be no “conventional” final written examination.

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- Let d be the number of days after the official due date that I receive the work.
- The actual mark will be Y = X * exp (-d/10)
- Everyone receives one grace day to be applied to one homework for the entire semester.

Course Assessment

- A1 90 - 100
- A2 85 - 89
- B1 75 - 84
- B2 65 - 74
- B3 60 - 64
- C1 50 - 59
- C2 40 - 49
- C1 35 - 39
- D1 25 - 34
- D2 20 - 24
- F 0 - 19

Tutorials

- Start in Week 3 of the semester.

Announcements

- Next class, Monday 14 September 2009

You are responsible for your own learning