Something about R

- Language and environment for statistical computing and graphics.
- Based on S language created by Chambers et al. at Bell Labs.
- Free Software, freeware version of S-PLUS.

S-PLUS

- Original S language developed by Chambers et al at Bell Labs in 1984.
- S-PLUS is based on S - company formed in late 80's now owned by Insightful has exclusive license for S code.
  - Corporate Focus - Finance, Pharma, etc.
  - Highly developed graphical user interface.
  - Web and Server based services.
  - Educational licensing conditions vary.
  - Now at Version 8.

R compared with S-PLUS

- Statistical capabilities now comparable - more new developments in R.
- Code largely portable between R and S-PLUS.
- Internal coding entirely different - speed differences.
- Support
  - R has an active mailing list (best for intermediate/advanced users).
  - S-PLUS also has a mailing list but also has more formal and reliable support desk.

Features

- Data handling and storage facility.
- Suite of operators for calculations on arrays, in particular matrices.
- Large, coherent, integrated collection of intermediate tools for data analysis.
- Graphical facilities for data analysis and display either on-screen or on hard copy.
- A fully developed programming language.
- C, C++ and Fortran code can be linked and called at run time.
- Wide variety of user contributed packages.

History

- Developed by Ross Ihaka and Robert Gentleman in NZ.
- Based on commands described in the Blue, White and Green S books.
- Not a clone of S-PLUS - has extra functions.
- Reliable and comprehensive for the last 2-3 years - v1.0 released February 2000.
- Current version is 2.9.2.
- Now supported by a volunteer team of developers together with many contributors.

Brief R session

```
> data()
> data(stackloss)
> plot(stackloss)
> summary(stackloss)
> stacklm = lm(stack.loss ~ . ,data=stackloss)
> summary(stacklm)
> plot(stacklm)
> X = as.matrix(cbind(1,stackloss[1:3,]))
> solve(t(X) %*% X,t(X) %*% stackloss$stack.loss)
> stacklm$coef
> #
> # ANCOVA in R : Starch Experiment
> #
> x = read.table("data.txt",h=T)
> g = lm(strength~thickness+factor(starch))
> summary(g)
> summary.aov(g)
> library()
```

How to get it

- Go to http://cran.us.r-project.org/
- Click on Windows
- Click on base
- Click on R-2.9.2-win32.exe
- Save on Desktop and open it to follow the instructions (Windows Setup Wizard).

Resources

- **Books**
  - Becker, Chambers and Wilks *The New S Language* - "The Blue Book" (Sv2).
  - Chambers and Hastie *Statistical Models in S* - "The White Book" (Sv3).
  - Chambers *Programming with Data* - "The Green Book" (Sv4).
  - Venables and Ripley *Modern Applied Statistics with S-PLUS (3rd Ed)* Recommended.
  - Venables and Ripley *S Programming* Not for Beginners.
  - Any book on S-PLUS will be usable.
- **Free Documentation**
  - *An introduction to R* - The Official Guide.
  - *Using R for Data Analysis and Graphics* by John Maindonald - Contributed Guide.
  - Online help pages.