Basic Introduction to R

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  - What is R?
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  ○ What is R?
  ○ Why use R?
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What is R?

- Environment for statistical computing and graphics[1]
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- based on S language from AT&T
Why R?

- Determine number of samples required for experiment
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- Analyse simulation results graphically
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- Embed the R code in your \LaTeX{} document directly see [http://www.ci.tuwien.ac.at/~leisch/Sweave/](http://www.ci.tuwien.ac.at/~leisch/Sweave/) and generate \LaTeX{} tables and graphs on the fly.
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Installation

- Download *base* package from R homepage
  
  www.r-project.org

- Installing extra packages e.g. DAAG
- on Windows change R shortcut by adding –internet2 argument so as to use IE settings for proxy.
- on Linux at shell prompt
  
  
  and
  
  export R_LIBS=~/lib/R

  Run R and input the following

  install.packages("DAAG")
  
  demo(graphics)

  try also persp and image or leave it empty
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- multiple plots
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- conditional plot (Shift+Ctrl++)
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- conditional plot (Shift+Ctrl++)
- boxplot explanation
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- Useful R references for copying examples from are [3], [4] and [2].
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Sample R session

Example from [7]

Listing 1: Simple R session

bash> `grep vector` omnetpp.vec

```r
vector 3 "hmipv6SaitNet.client1.ping6App" "pingRTT" 1
vector 4 "hmipv6SaitNet.client1.ping6App" "pingDrop" 1
vector 5 "hmipv6SaitNet.client1.ping6App" "handoverLatency" 1
```

bash> R

```r
R> rttscan <- scan(pipe(paste("grep ^3", "omnetpp.vec")),
                 list (dummy=0, time=0, rtt=0))
R> rtt <- data.frame(run=1, rtt=rttscan$rtt, 
                    time=rttscan$time)
R> rttscan <- scan(p <- pipe(paste("grep ^3", "omnetpp-1.vec")),
                 list (dummy=0, time=0, rtt=0))
R> rtt2 <- data.frame(run=2, rtt=rttscan$rtt, time=rttscan$time)
R> rtt <- rbind(rtt, rtt2)
R> close(p); rm(rtt2, rttscan, p)
```
Sample R session cont’d

Listing 2: Simple R session

```r
R> summary(rtt)

       run    rtt     time
  Min.  :1.000 Min. :0.04043 Min. : 40.1
  1st Qu.:1.000 1st Qu.:0.10115 1st Qu.:168.9
  Median :1.000 Median :0.10134 Median :297.8
  Mean  :1.499 Mean  :0.09966 Mean  :296.6
  3rd Qu.:2.000 3rd Qu.:0.10153 3rd Qu.:425.9
  Max.  :2.000 Max. :0.10273 Max. :550.0

R> plot(rtt$time[rtt$run == 1], rtt$rtt[rtt$run == 1], type="S")

R> source(path.expand("~/src/IPv6Suite/Etc/scripts/functions.R"))

R> jl.ci(rtt$rtt, rtt$run)

  No. of Handovers   Mean    Lower CI limit    Upper CI limit
[1,]        9952 0.0996647 0.09946919 0.09986023
[2,]        9905 0.0996532 0.09945673 0.09984966
```