R and spreadsheets –
combining different programming paradigms

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Topics covered

Spreadsheet examples

Conceptual issues

User profiles

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Why spreadsheets as client?

Well known user interface

Easy data manipulation

Integration into daily working environment

Widely accessible environment for
    numerical computations

Simple (simplistic?) toolkit for static and
    animated graphics

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User profiles

Methods developer

Sophisticated methods user
and small scale application developers

Naïve user knowledgeable about the
spreadsheet model

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Design issues for user interface

Closed application

Some "end user programming"

Open development environment

Enhancement
of core spreadsheet functionality

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Language paradigms

Main difficulty
Coping with different paradigms
in one application

In R, the user has total control over
"calculation flow"

In Excel, the application triggers calculation
Excel decides about the order of calculation!

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Language paradigms

Common data types

statconnDCOM server (by Thomas Baier)

supports arrays which may even contain different scalar data types

These arrays can be accessed both from R and from VBA.

Excel "by nature" only supports 2-dimensional arrays (ranges)

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Integration

Excel keeps state in the worksheet
(cells and/or ranges)

R keeps state in variables

State in both applications may become
"out of sync"

Excel does computations "on the safe side",
better too often than not often enough

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Integration

So far Excel was client and R was server

rcom also allows R as client and Excel as server

This way, R can control Excel transfer data in both directions, create spreadsheet formulas …

Excel also could become the data editor for R

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Tools for subtasks

Excel (more general: spreadsheets)

– Data preparation and manipulation

– Exploratory methods (possibly)

– Presentation

R

– Powerful analytical methods

– Exploratory methods (numerically intensive)

– Preparing data for visual presentation

– Advanced statistical graphics (additional libraries)

VBA

– Writing user interfaces on top of Excel

Transfer large amount of data outside of recalculation statconn

More information

R:
http://www.R-project.org
   CRAN repositories

Spreadsheets:
http://sunsite.univie.ac.at/Spreadsite

RExcel and R(D)COM
http://rcom.univie.ac.at
http://www.statconn.com

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