Managing Large Sets Of Models

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UseR 2006

Outline

Model And Model Space

- `Models` may be fit from a variety of different classes
  - e.g. lm, gam, rpart
- and to variations of the original dataset
  - the (unmodified) dataset
  - subsets of the data
  - versions using transformed variables
  - datasets from sampling (e.g. bootstrapping)

Conclusion

Model space size is affected by the range of models, by transformations and by sampling

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Model Analysis

- model statistics (for model selection/comparison)
  - global statistics for comparing overall fit
  - measures of variable importance
  - residuals for comparing local fit

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Models yield much useful data for further analysis and you need a tool to organise that flood of data

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Technical Requirements

- store model forms and results
- commands in R ⇔ series of textual input
- model information includes
  - formula
  - global statistics (e.g. deviance)
  - coefficient estimates
  - residuals

MORET

In order to manage and compare model results a lot of data has to be stored. The software "MORET" uses a relational database for this (see next slide).

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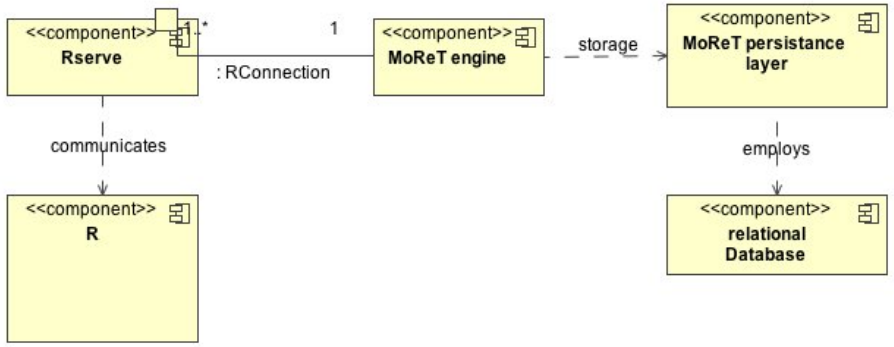
Used Components



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1. Introduction
2. Managing Models
   - Software Requirements
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   - Model Comparison

Working With Moret

- load datasets with the MORET-GUI
- fit models to the data
- use MORET to manage the database of the models.
  - export model data
  - use the Model Explorer

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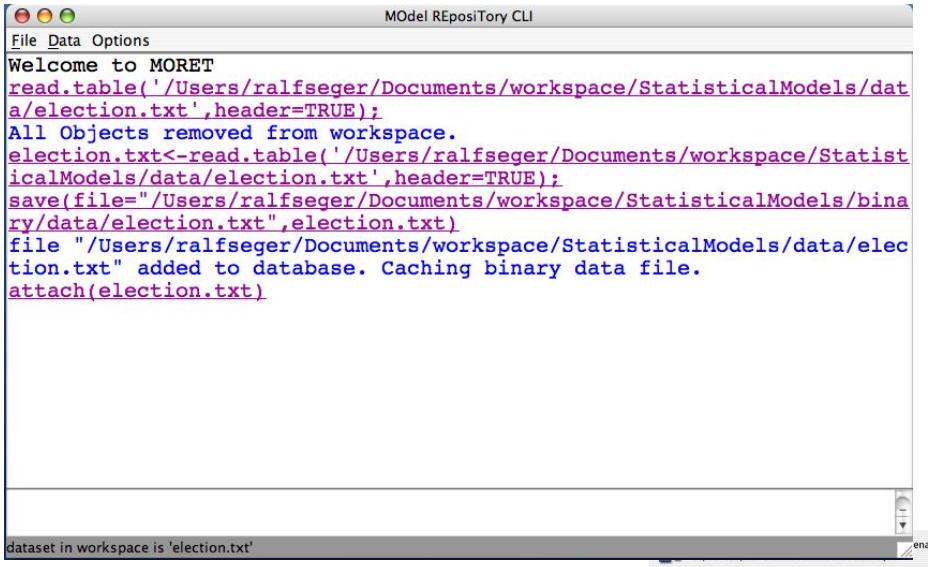
Working With Moret/2



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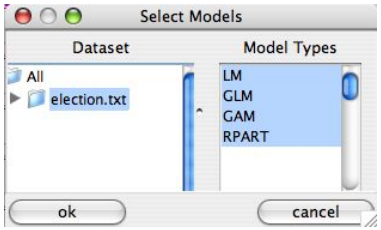
Model Selection



Preselect Models

- Models space is huge.
- Work with selected subsets of all models.

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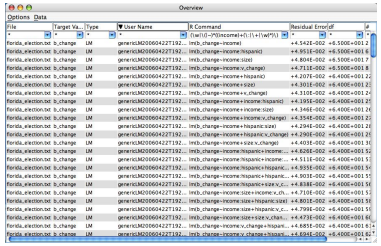
Model Selection



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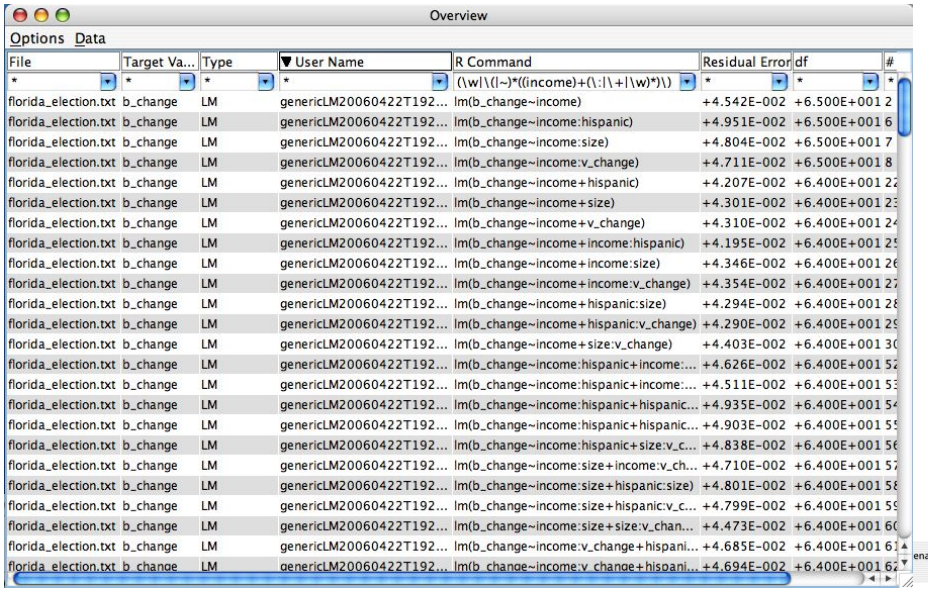
Model Overview



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florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:hispanic)	+4.951E-002	+6.500E+001	6
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:size)	+4.804E-002	+6.500E+001	7
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:v_change)	+4.711E-002	+6.500E+001	8
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income+hispanic)	+4.207E-002	+6.400E+001	22
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income+size)	+4.301E-002	+6.400E+001	23
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florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income+income:size)	+4.346E-002	+6.400E+001	26
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income+income:v_change)	+4.354E-002	+6.400E+001	27
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florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:hispanic+income:...	+4.511E-002	+6.400E+001	53
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:hispanic+hispanic...	+4.935E-002	+6.400E+001	54
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:hispanic+hispanic...	+4.903E-002	+6.400E+001	55
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florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:v_change+hispani...	+4.685E-002	+6.400E+001	61
florida_election.txt	b_change	LM	genericLM20060422T192...	lm(b_change~income:v_change+hispani...	+4.694E-002	+6.400E+001	62

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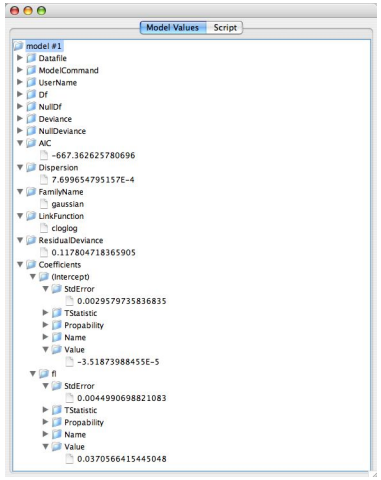
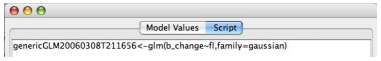
Model Overview Options



Working with the Model Table

- inspect a single model
- view the creation script
- export models

Model Overview Options



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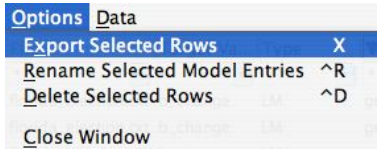

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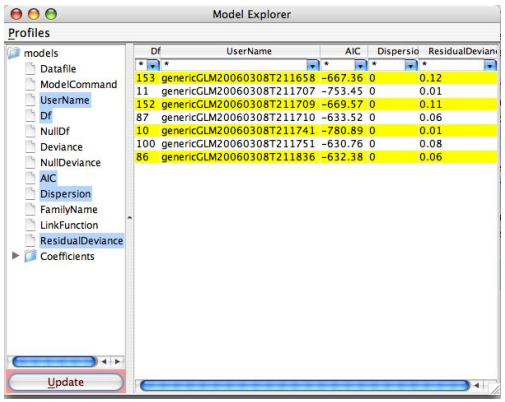

Actions

- dynamically select attributes of the stored models
- use predifined profiles (e.g. for all coefficient values)

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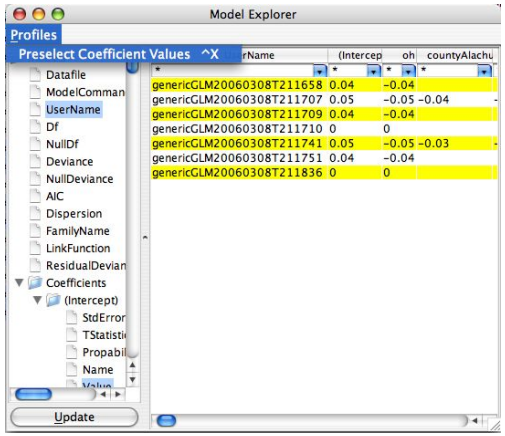

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Using External Applications

External Interfaces

- export models to XML or CSV
- copy and paste to a spreadsheet

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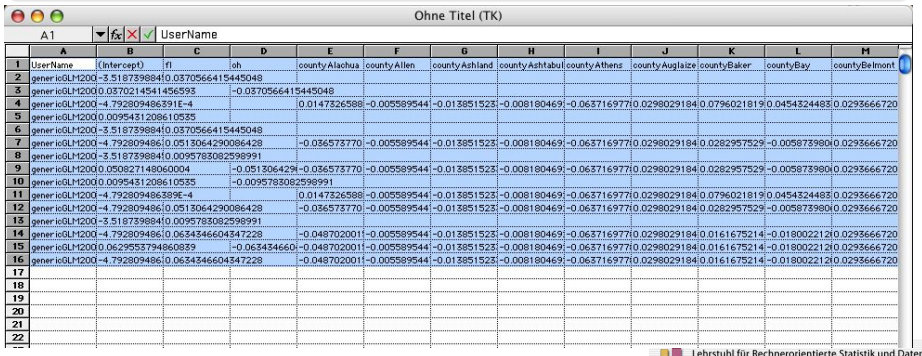

	A	B	C	D	E	F	G	H	I	J	K	L	M
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8	generic	GLM200	-3.518739884	0.009578308	2598991										
9	generic	GLM200	0.050827148	060004	-0.051306429	-0.036573770	-0.005589544	-0.013851523	-0.008180469	-0.063716977	0.029802918	4 0.028295752	9 -0.005873980	0.029366672	0
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15	generic	GLM200	0.062955379	4860839	-0.063434660	-0.048702001	-0.005589544	-0.013851523	-0.008180469	-0.063716977	0.029802918	4 0.016167521	4 -0.018002212	0 0.029366672	0
16	generic	GLM200	-4.792809486	0.063434660	4347228	-0.048702001	-0.005589544	-0.013851523	-0.008180469	-0.063716977	0.029802918	4 0.016167521	4 -0.018002212	0 0.029366672	0
17															
18															
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- Managing large sets of models is possible using MORET
- MORET can be used as link to other applications for further analysis

- Further developments
  - Integration of more model alternatives
  - Better control of transformed variables

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Additional Sources I

R. Seger
project homepage.
http://stats.math.uni-augsburg.de/software/.

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