Using R for teaching statistics to nonmajors: Comparing experiences of 2.5 different approaches

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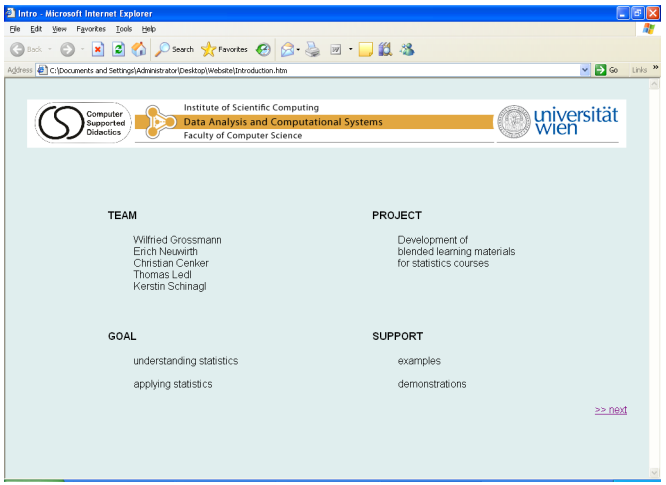
Approaches

- Based on guided code generation
- Based on exploring existing code
- Based on spreadsheet interaction

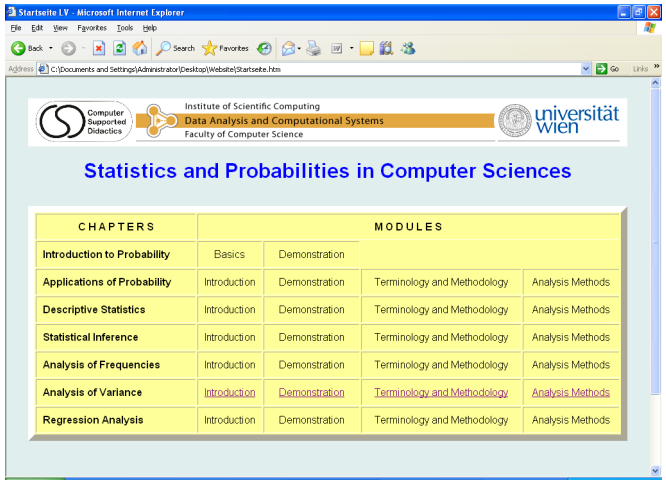
Approaches

- Based on guided code generation
  - RCommander and extensions
  - Temple University has a course based on this approach
- Based on exploring existing code
  - RPad
  - University of Vienna has a course based on this approach
- Based on spreadsheet interaction
  - RExcel
  - University of Vienna has lab classes based on this approach

RPad



RPad



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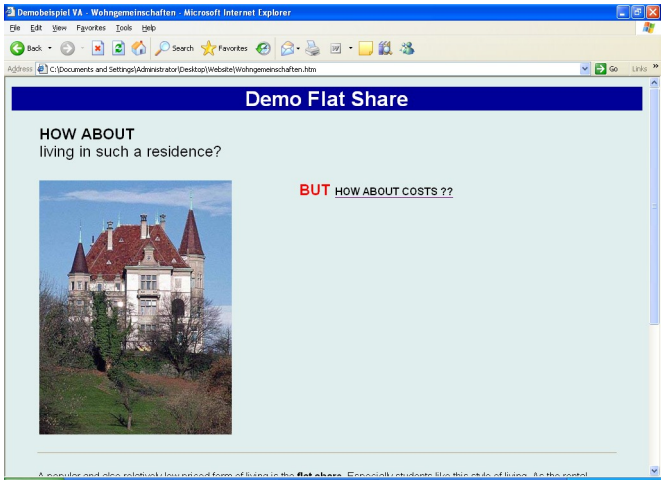

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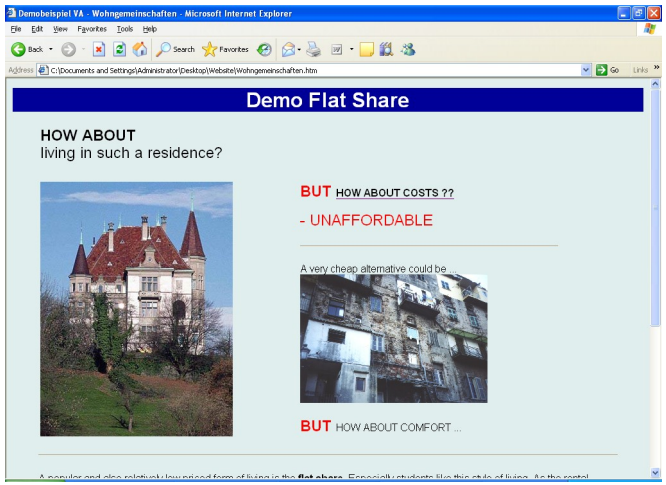

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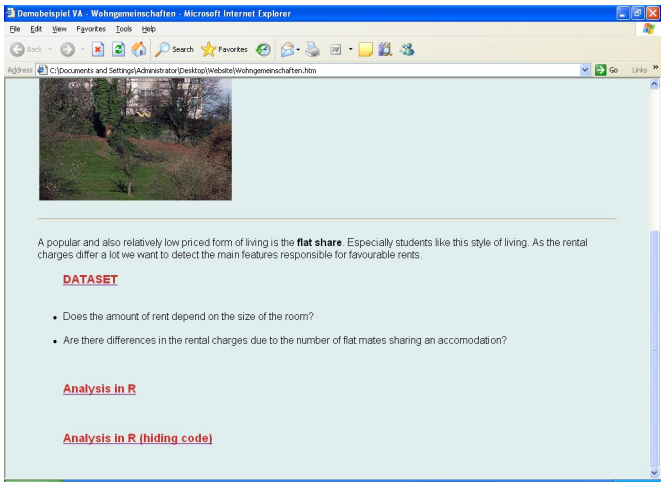

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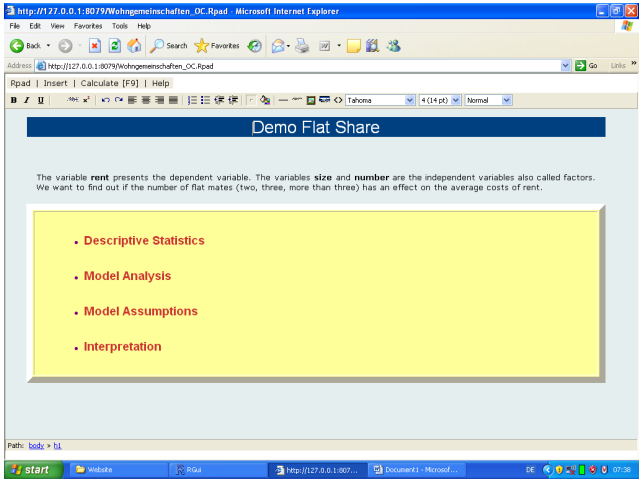

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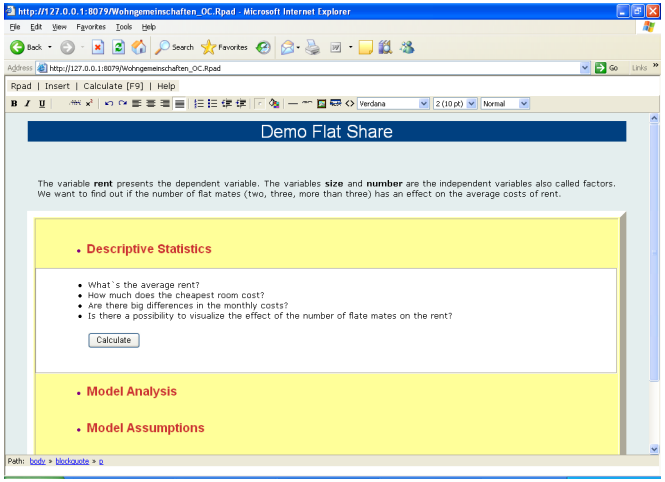

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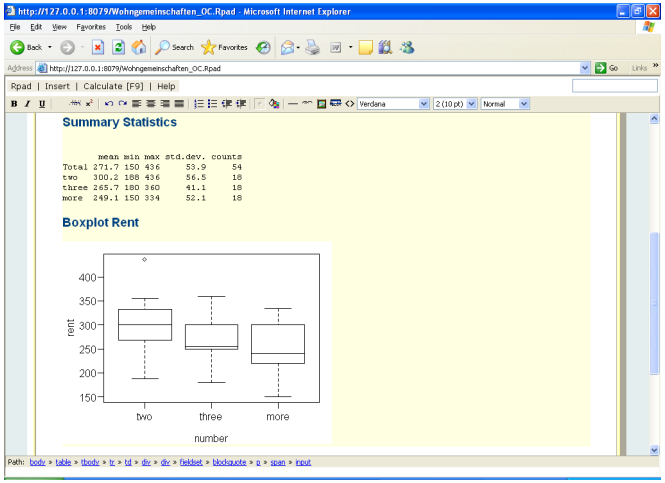

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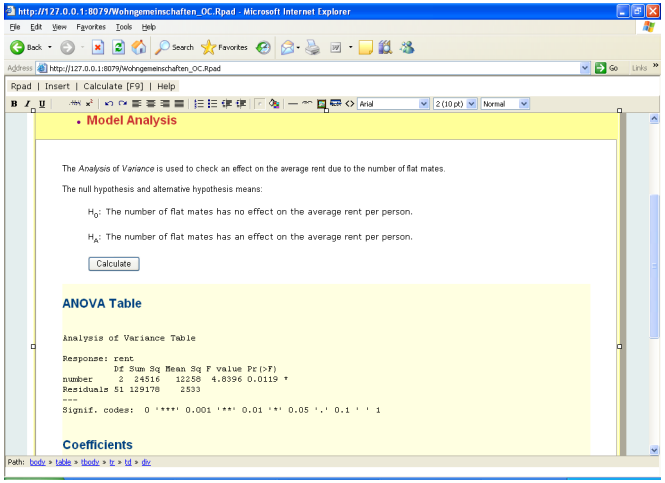

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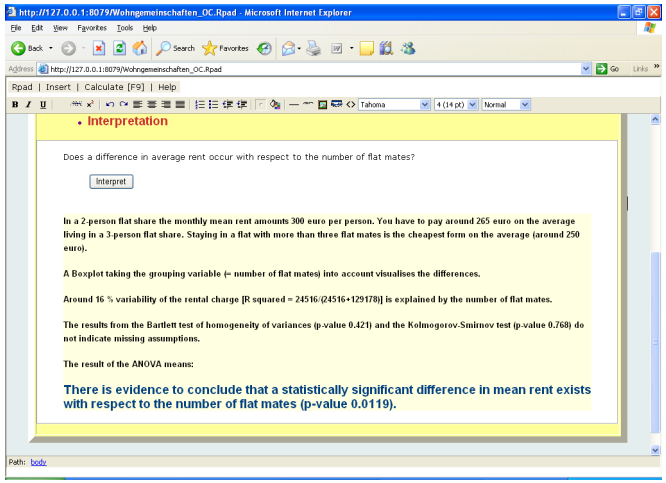

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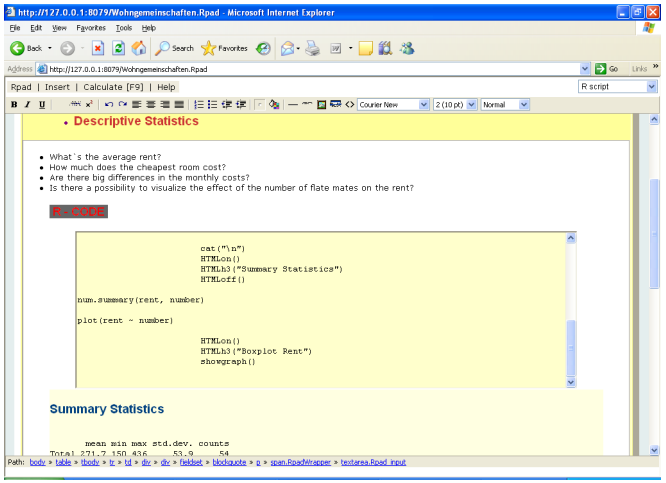

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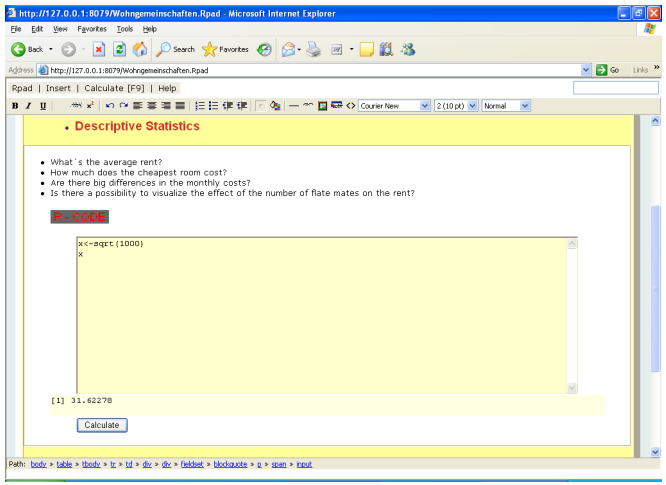


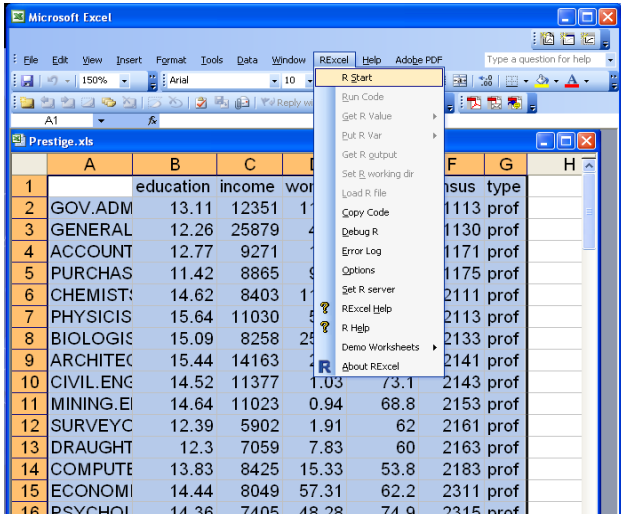
RExcel

- Approach allows students to use a tool they already know and embed advanced statistical methods in the spreadsheet paradigm
- At the same time, prior spreadsheet experience can help with data manipulation and graphics creation

RExcel and RCommander

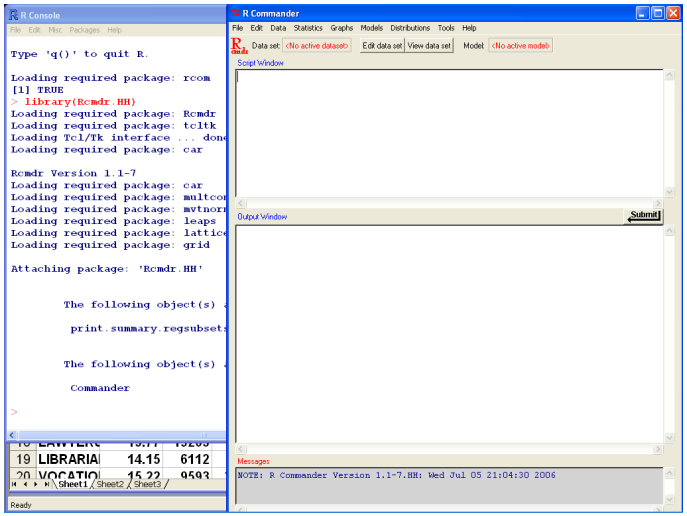
- Temple University currently teaches an introductory statistics course based on RCommander and RExcel.
- Statistics with Excel always needs an addin. We use R, the best possible addin.
- We use the RExcel interface to get data from Excel into R and to get tabular results back from R.
- RCommander provides a clickable menu interface to R.

RExcel and RCommander



- Excel spreadsheet containing the Prestige dataset from the car package
- Click on the RExcel menu item to start R

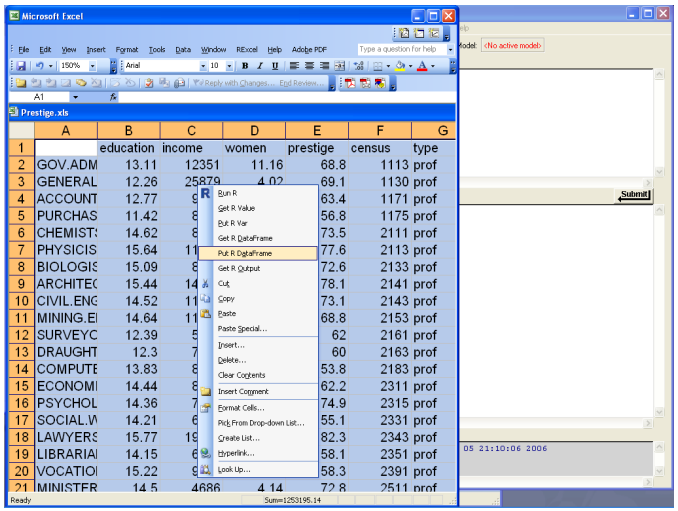
RExcel and RCommander



- In the R GUI, enter

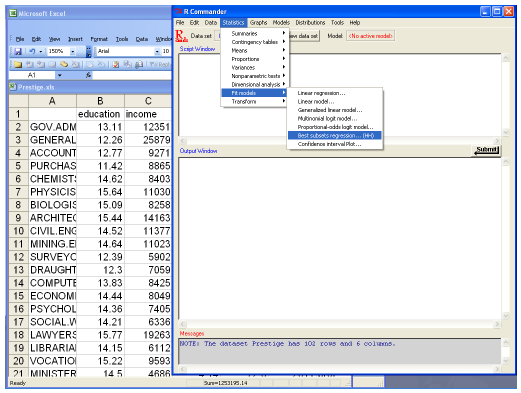
  library(Rcmdr.HH)
- This starts the Rcmdr window with the HH menu

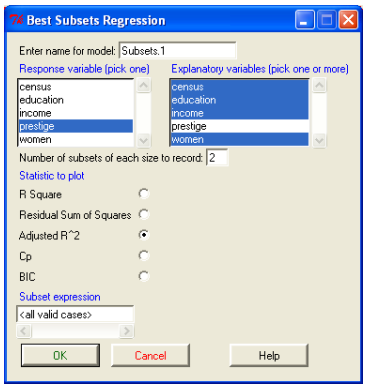
RExcel and RCommander



- Highlight and right click a region in Excel
- Send the region to RCmdr

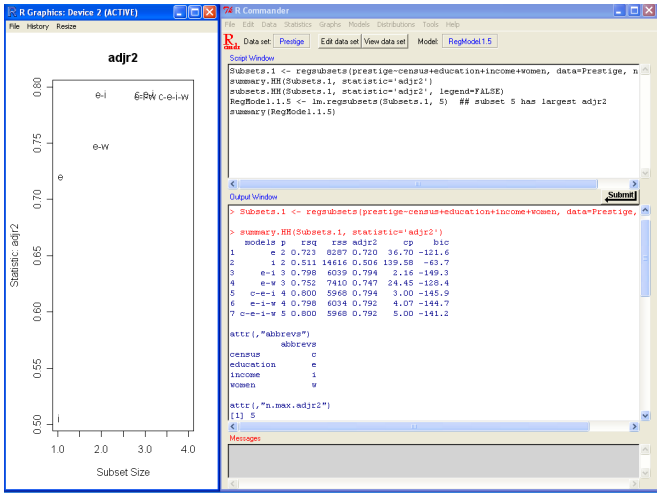
RExcel and RCommander





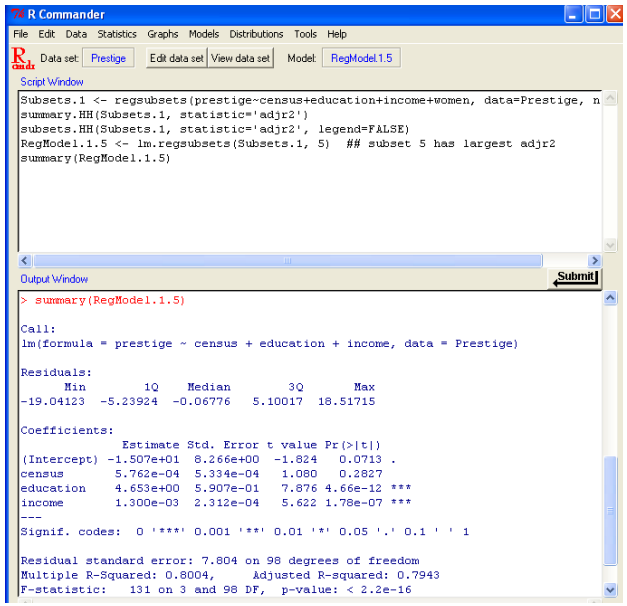
- Click the "Statistics/Fit Models/Best Subsets Regression" menu
- Fill in the model specification box

RExcel and RCommander



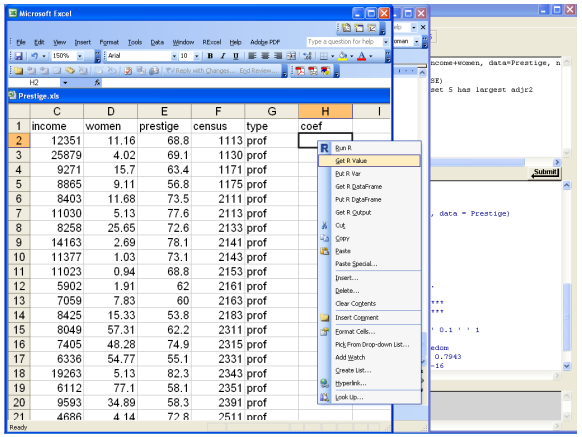
- The model specification box
  a. Generates R script
  b. Executes R script
  c. Displays graph
  d. Identifies model with the largest adjusted R^2

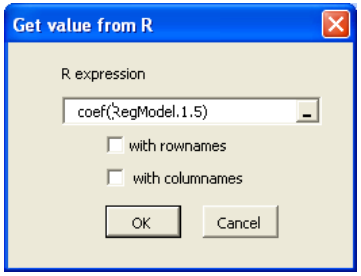
RExcel and RCommander



e. displays the summary of the selected model

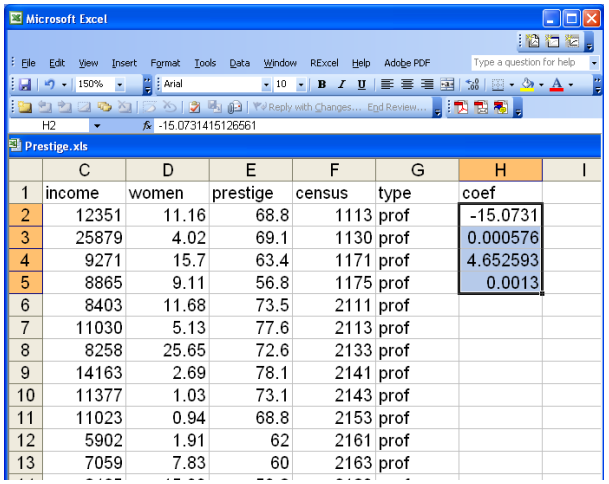
RExcel and RCommander





- We return the regression coefficients from the selected model back to the Excel spreadsheet.

RExcel and RCommander



	C	D	E	F	G	H	I
1	income	women	prestige	census	type	coef	
2	12351	11.16	68.8	1113	prof	-15.0731	
3	25879	4.02	69.1	1130	prof	0.000576	
4	9271	15.7	63.4	1171	prof	4.652593	
5	8865	9.11	56.8	1175	prof	0.0013	
6	8403	11.68	73.5	2111	prof		
7	11030	5.13	77.6	2113	prof		
8	8258	25.65	72.6	2133	prof		
9	14163	2.69	78.1	2141	prof		
10	11377	1.03	73.1	2143	prof		
11	11023	0.94	68.8	2153	prof		
12	5902	1.91	62	2161	prof		
13	7059	7.83	60	2163	prof		

- We return the regression coefficients from the selected model back to the Excel spreadsheet.

RExcel and RCommander

- Our addin to RCommander is currently available as an R package at http://astro.ocis.temple.edu/~rmh/Rcmdr.HH
- Some of our additions will be included in the next release of RCommander.
- We thank John Fox, the developer of RCommander, for help in designing our addins to his package.