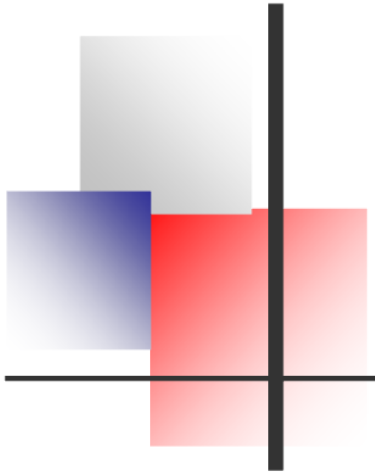


VII ITALIAN *STATA* USERS MEETING

Bologna, November 11-12, 2010

TABULA

What You See Is What You Tabulate

Giovanni Luca Lo Magno
(lomagno.gl@virgilio.it)
Department of National Accounts and Social Processes Analysis
University of Palermo

Workflow of data analysis

Steps in the workflow

1) Cleaning data
2) Performing analysis
3) Presenting findings
4) Saving your work

Tasks within each step

a) Planning
b) Organization
c) Documentation
d) Execution

References: J. Scott Long (2009) The workflow of data analysis: principles and practice, Stata Press

Criteria for choosing a workflow

1) Accuracy
2) Efficiency
3) Simplicity
4) Standardization
5) Automation
6) Usability
7) Scalability

References: J. Scott Long (2009) The workflow of data analysis: principles and practice, Stata Press

How do you get it?

What You See Is What You Mean (WYSIWYM)

```
<html>
<body>
<h1>CHAPTER I</h1>
<h2>DOWN THE RABBIT-HOLE</h2>
<p>Alice was beginning to get very
tired of sitting by her sister on
the bank, and of having nothing to
do: once or twice she had peeped
into the book her sister was
reading, but it had no pictures or
conversations in it, "and what is
the use of a book' thought Alice,
'without pictures or
conversatoins?"</p>
</body>
</html>
```

What You See Is What You Get (WYSIWYG)

CHAPTER I

DOWN THE RABBIT-HOLE

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book' thought Alice, 'without pictures or conversatoins?'

Sometimes what you get it’s only “abc”!

This is what you see editing an RTF file manually:

```
{ \ rtf1\ ansi\ ansicpg1252\ uc1 \ deff0\ deflang1033deflangfe1033{ \ fonttbl{ \ f0\
froman\ fcharset0\ fprq2{ \ *\ panose\020206030504050203040}} Times New Roman;} } { \
colortbl;\ red0green0\ blue0;\ red0\ green0\ blue255;\ red0\ green255\ blue255;\red0\
green255\ blue0;\ red255\ green0\ blue255;\ red255\ green0\blue0;\ red255\ green255\
blue0;\ red255\ green255\ blue255;\ red0\green0\ blue128;\ red0\ green128\ blue128;\
red0\ green128\ blue0;\red128\ green0\ blue128;\ red128\ green0\ blue0;\ red128\
green128\blue0;\ red128\ green128\ blue128;\ red192\ green192\ blue192;}{ \
stylesheet{ \ widctlpar\ adjustright \ fs20\ cgrid \ snext0 Normal;}{ \ *\ cs10 \
additive Default Paragraph Font;} } { \ info{ \ title }{ \ author Steven Holzner} { \
operator Steven Holzner} { \ creatimyr2000\ mo\ dy\ hr\ min} { \ revtim\ yr2000\ mo4\
dy17\ hr13\ min55}{ \ version1} { \ edmins1} { \ nofpages1} { \ nofwords0} { \
nofchars1}{ \ *\ company SteveCo} { \ nofcharsws1} { \ vern89} } \ widowctrl\
ftnbj\aenddoc\ formshade\ viewkind4\ viewscale100\ pgbrdrhead\ pgbrdrfoot\fet0\ sectd
\ psz1\ linex0\ endnhere\ sectdefaultcl { \ *\ pnseclvl1\pnucrm\ pnstart1\
pnindent720\ pnhang{ \ pntxta .} } { \ *\ pnseclvl2\pnucltr\ pnstart1\ pnindent720\
pnhang{ \ pntxta .} } { \ *\ pnseclvl3\pndec\ pnstart1\ pnindent720\ pnhang{ \ pntxta
.} } { \ *\ pnseclvl4\pnlcltr\ pnstart1\ pnindent720\ pnhang{ \ pntxta )} } { \ *\
pnseclvl5\pndec\ pnstart1\ pnindent720\ pnhang{ \ pntxtb (} { \ pntxta )} }{ \ *\
pnseclvl6\ pnlcltr\ pnstart1\ pnindent720\ pnhang{ \ pntxtb (}{ \ pntxta )} } { \ *\
pnseclvl7\ pnlcrm\ pnstart1\ pnindent720\ pnhang{ \ pntxtb (} { \ pntxta )} } { \ *\
pnseclvl8\ pnlcltr\ pnstart1\pnindent720\ pnhang{ \ pntxtb (} { \ pntxta )} } { \ *\
pnseclvl9\ pnlcrm\pnstart1\ pnindent720\ pnhang{ \ pntxtb (} { \ pntxta )} } \ pard\
plain\sl480\ slmult1\ widctlpar\ adjustright \ fs20\ cgrid { \ b\ fs24\ ulabc }{ \ b\
ul \ par } }
```

and this is what you get:

abc

Creating a table of summary statistics

The Stata WYSIWYM approach

```
. sysuse nlsw88
(NLSW, 1988 extract)

. table race married, contents(mean wage) format(%3.1f)

----------------------------
          |     married
     race |  single  married
----------+-----------------
    white |     8.9      7.7
    black |     6.7      7.0
    other |     8.4      8.6
----------------------------
```

Notes about the `table` command:

- Up to seven-way tables can be created
- Up to five statistics may be displayed in each cell of the table.
- Text inside the table can’t be obtained.

About

What is TABULA?

- It’s a software that helps you to create and save complex statistical tables.
- It’s a complete software written in C++: it’s not a Stata command.
- It’s a graphic user interface (GUI) front end for Stata.
- It’s not a complete statistical software, but it uses Stata as statistical engine by executing it in batch mode.

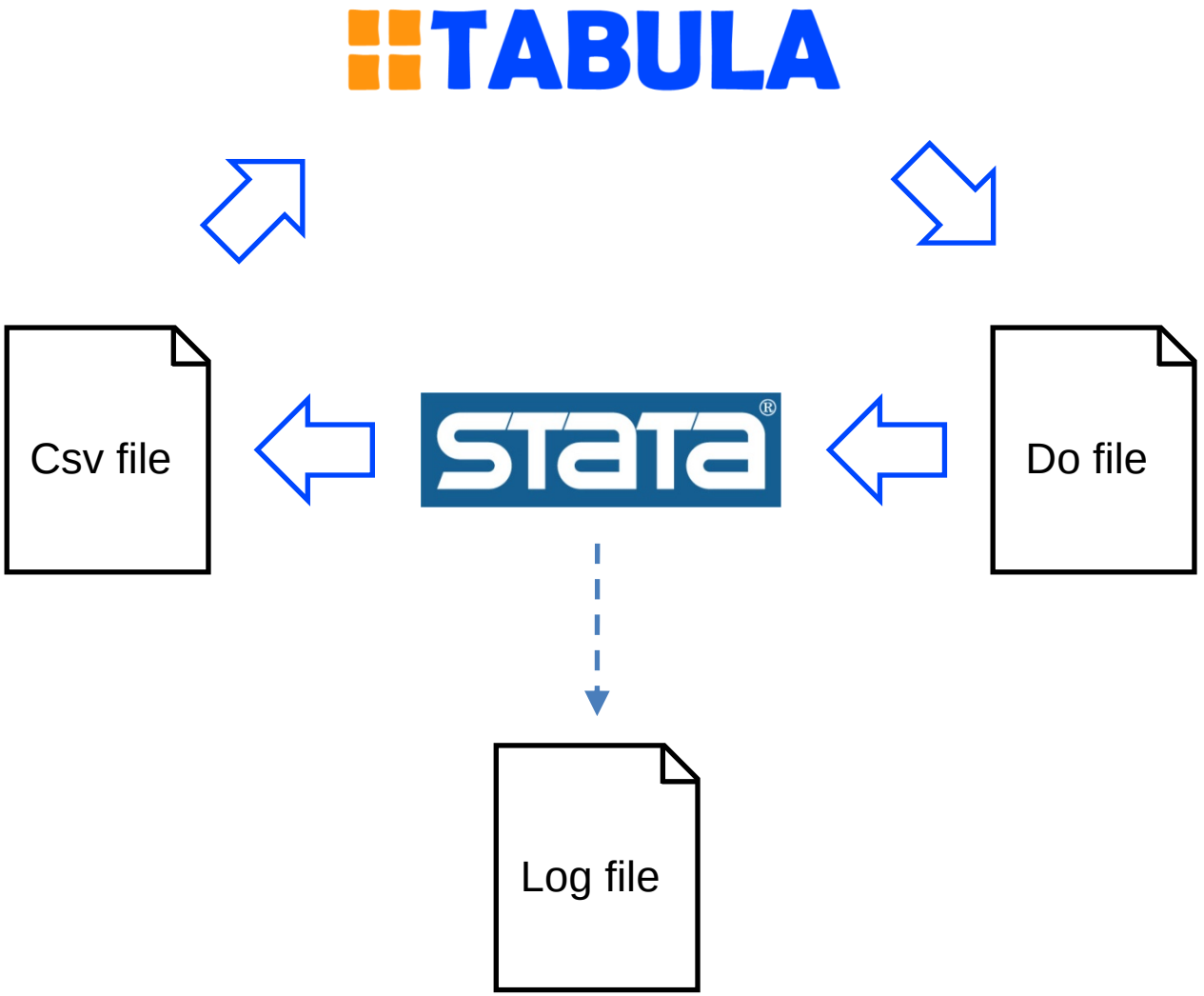
Technical notes

- Tabula is written in C++.
- Tabula uses Qt 4.5.3 C++ libraries for the GUI. Qt (pronunced officially as “cute”) is a project mantained by Nokia™ and a developers’ community.
- Qt is cross-platform, but until now Tabula was compiled only for Windows.
- Tabula saves files in XML format.
- The output file is in CSV format.

Disclaimer

Tabula is released in beta version.
Many bugs are present and many hours of testing, debugging and more development are still needed.
Users are the only people responsable for the correctness of computations.

How Tabula works



How humans read a table

column

TAB. 7.5 MEAN HOURLY WAGE

Race	Marital status: *Single*	Marital status: *Married*
White	8.9	7.7
Black	6.7	7.0
Other	8.4	8.6

row →

The figure 7.0 is the mean hourly wage of individuals whose race is “black” and marital status is “married”

The implicit condition:

IF RACE=*BLACK* AND MARITAL STATUS=*MARRIED*

Tabula: the basic idea

```
. label list racelbl
racelbl:
           1 white
           2 black
           3 other

. label list marlbl
marlbl:
           0 single
           1 married
```

TAB. 7.5 MEAN HOURLY WAGE

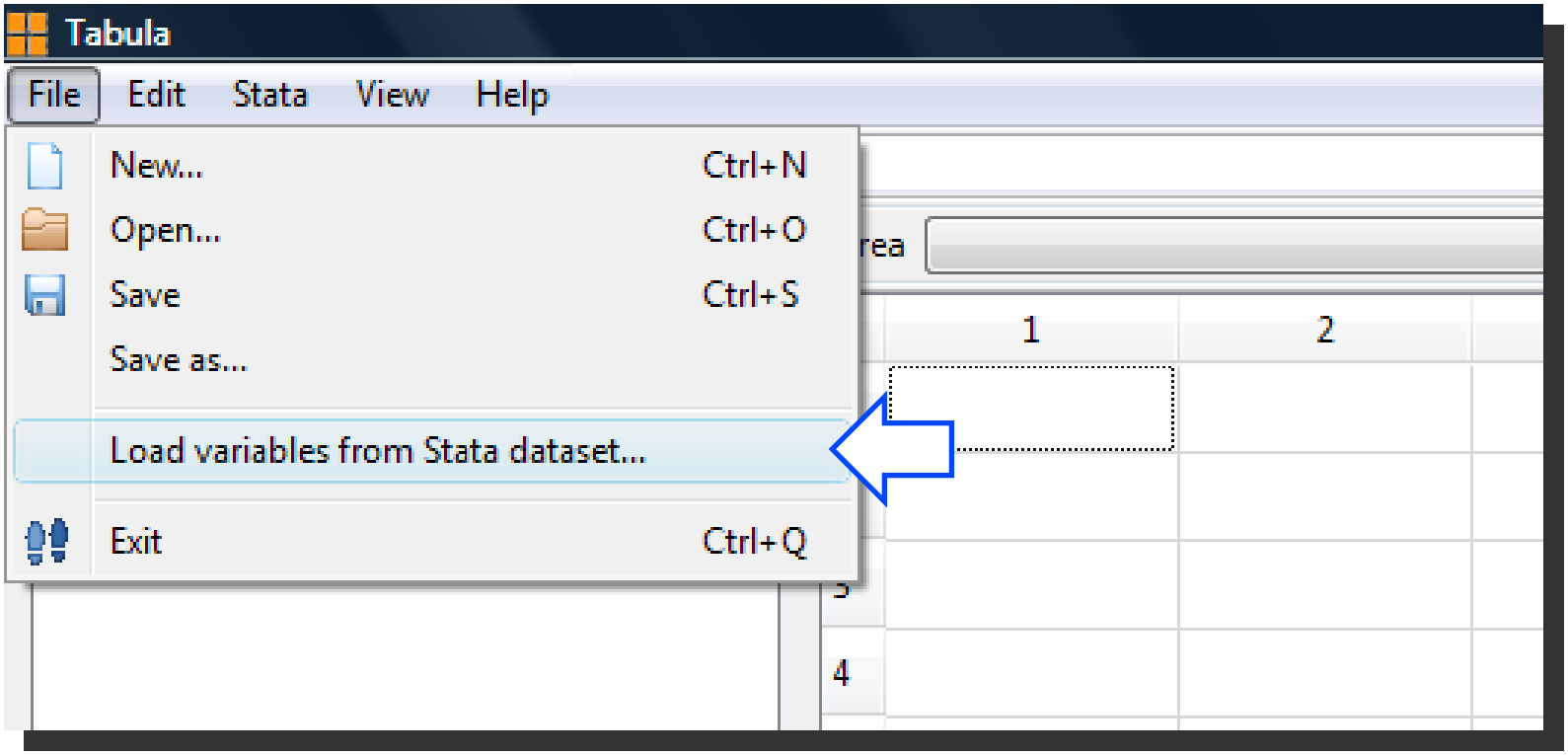
Race	Marital status: *Single*	Marital status: *Married*
White	8.9	7.7
Black	6.7	7.0
Other	8.4	8.6

The implicit command:

```
summarize wage if race==1 and married==1
```

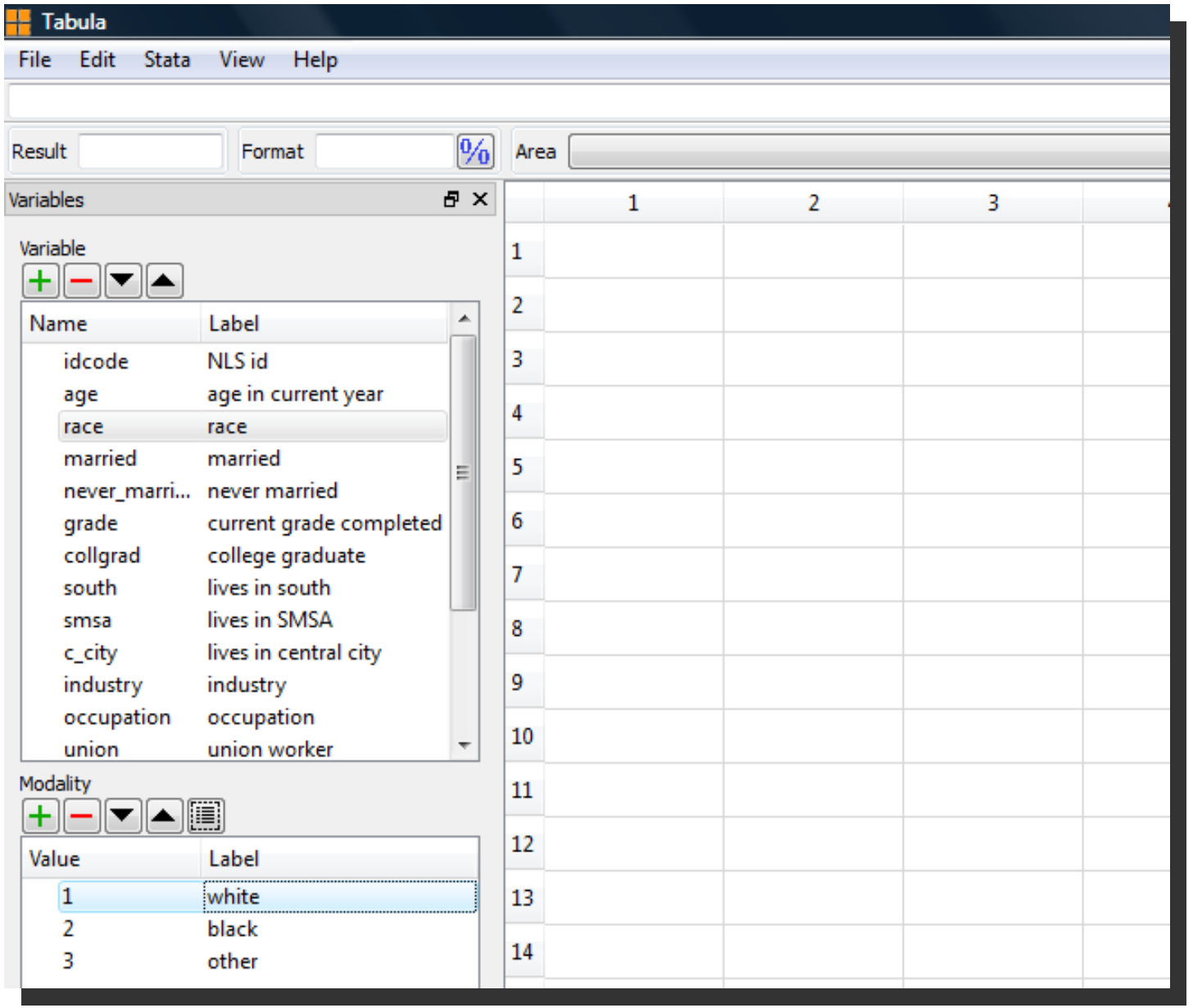
Loading variables from Stata dataset

Load nlsw88.dta (example dataset installed in Stata)



Tabula 0.3 beta loads variables only from format-114 datasets
(not Stata 9 datasets)

Variables and modalities loaded in Tabula

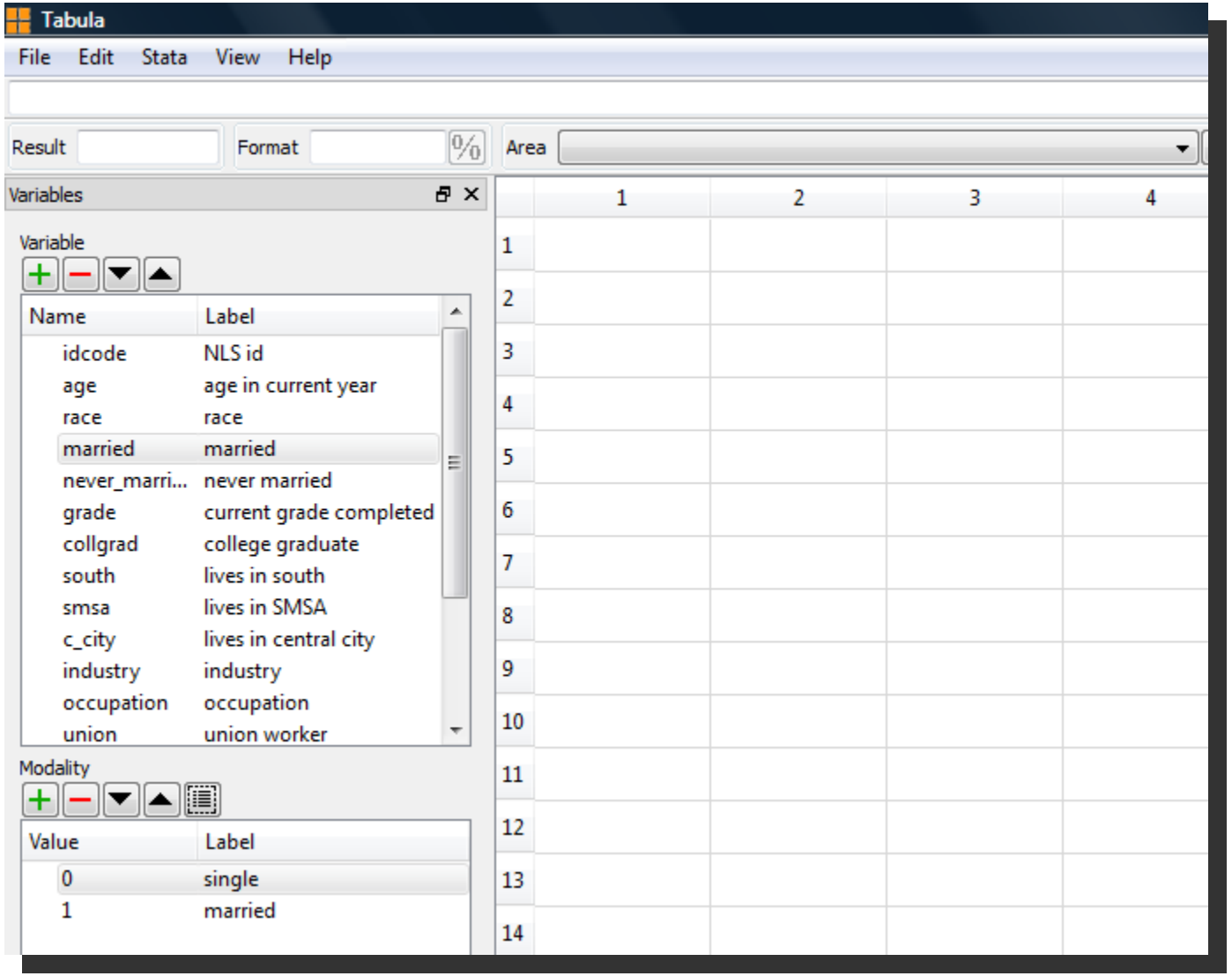


Variable list

Modalities of "race" variable

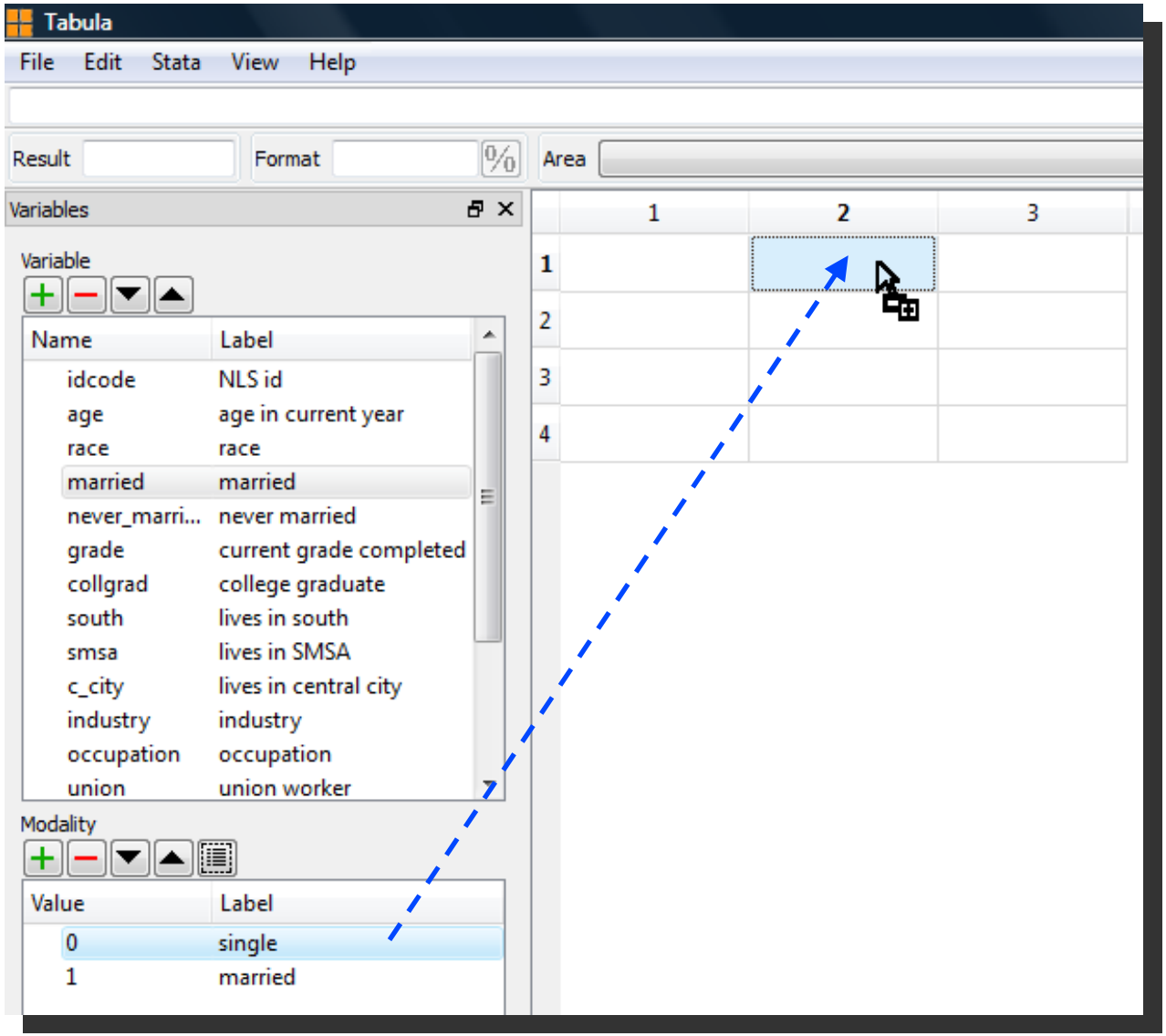
Dragging and dropping a modality on a cell

Step 1: select modality



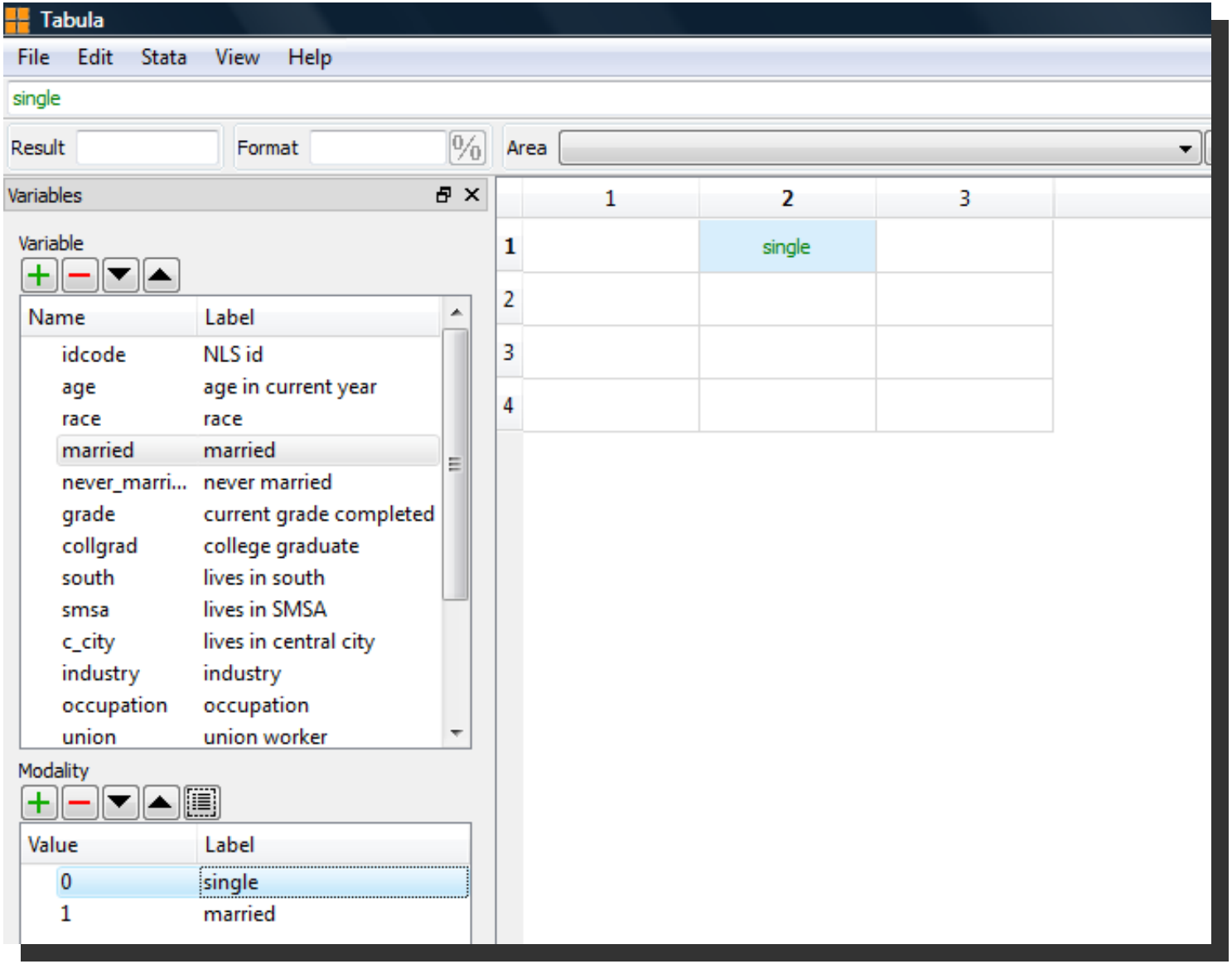
Dragging and dropping a modality on a cell

Step 2: drag modality

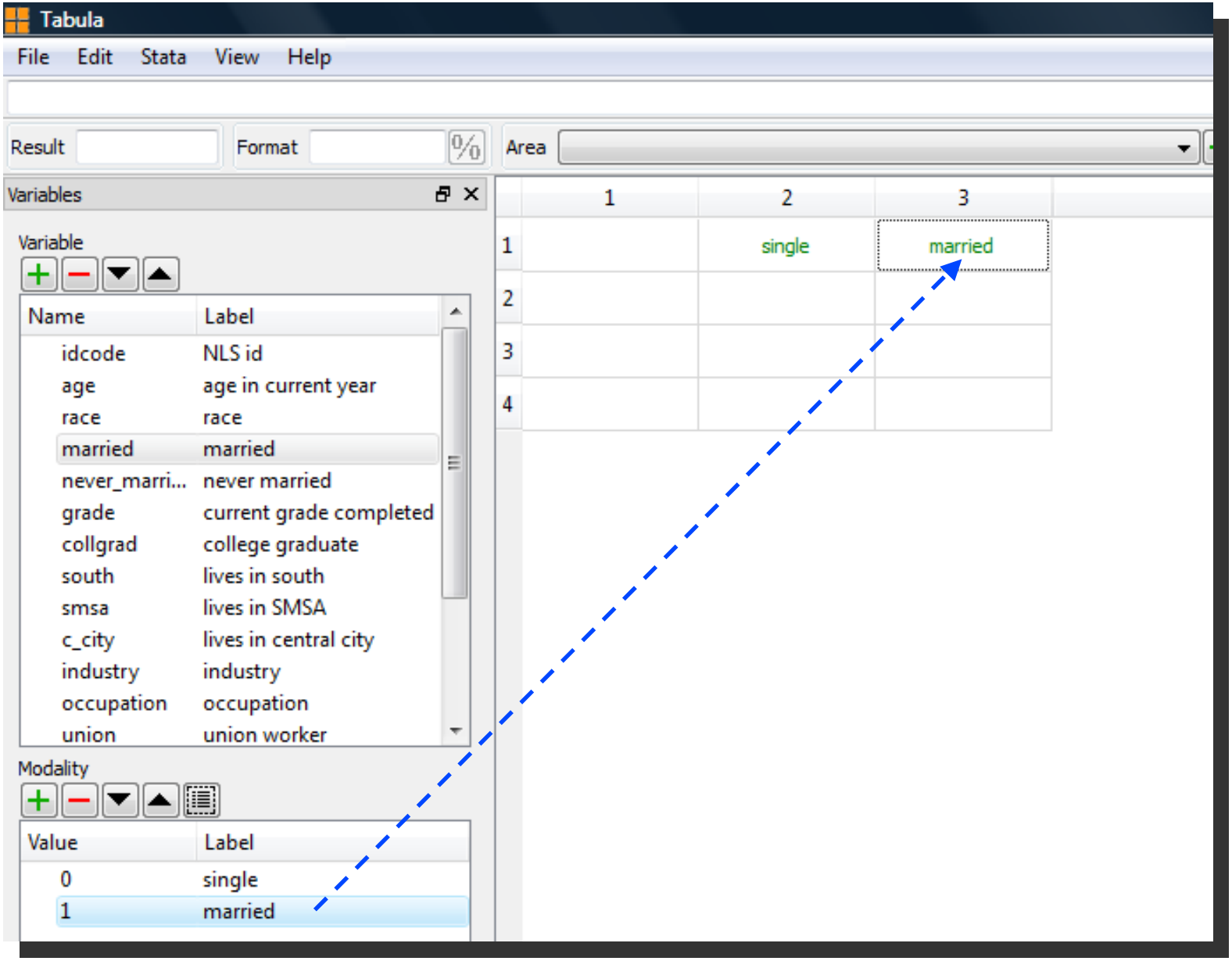


Dragging and dropping a modality on a cell

Step 3: drop modality

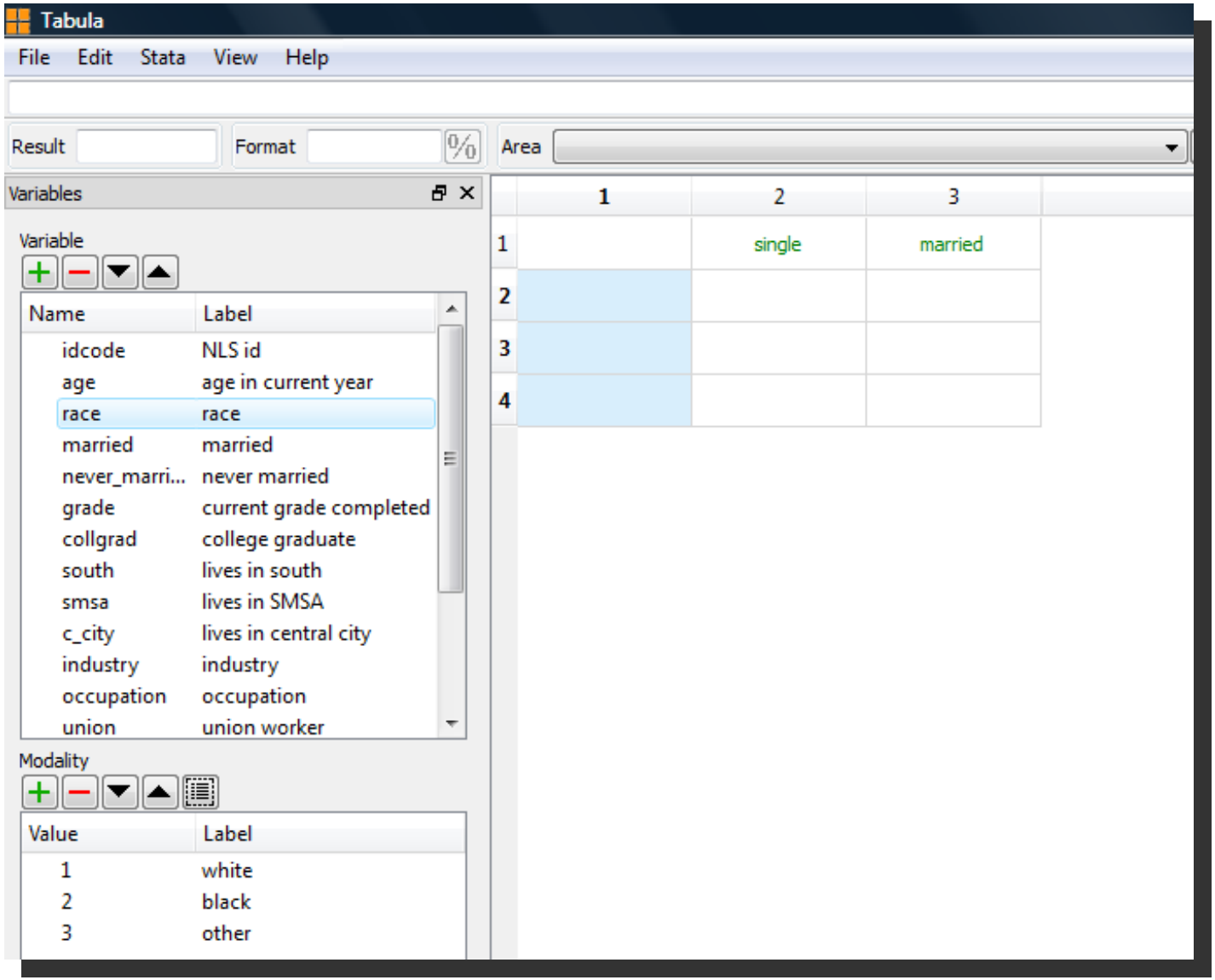


Completing your column headers



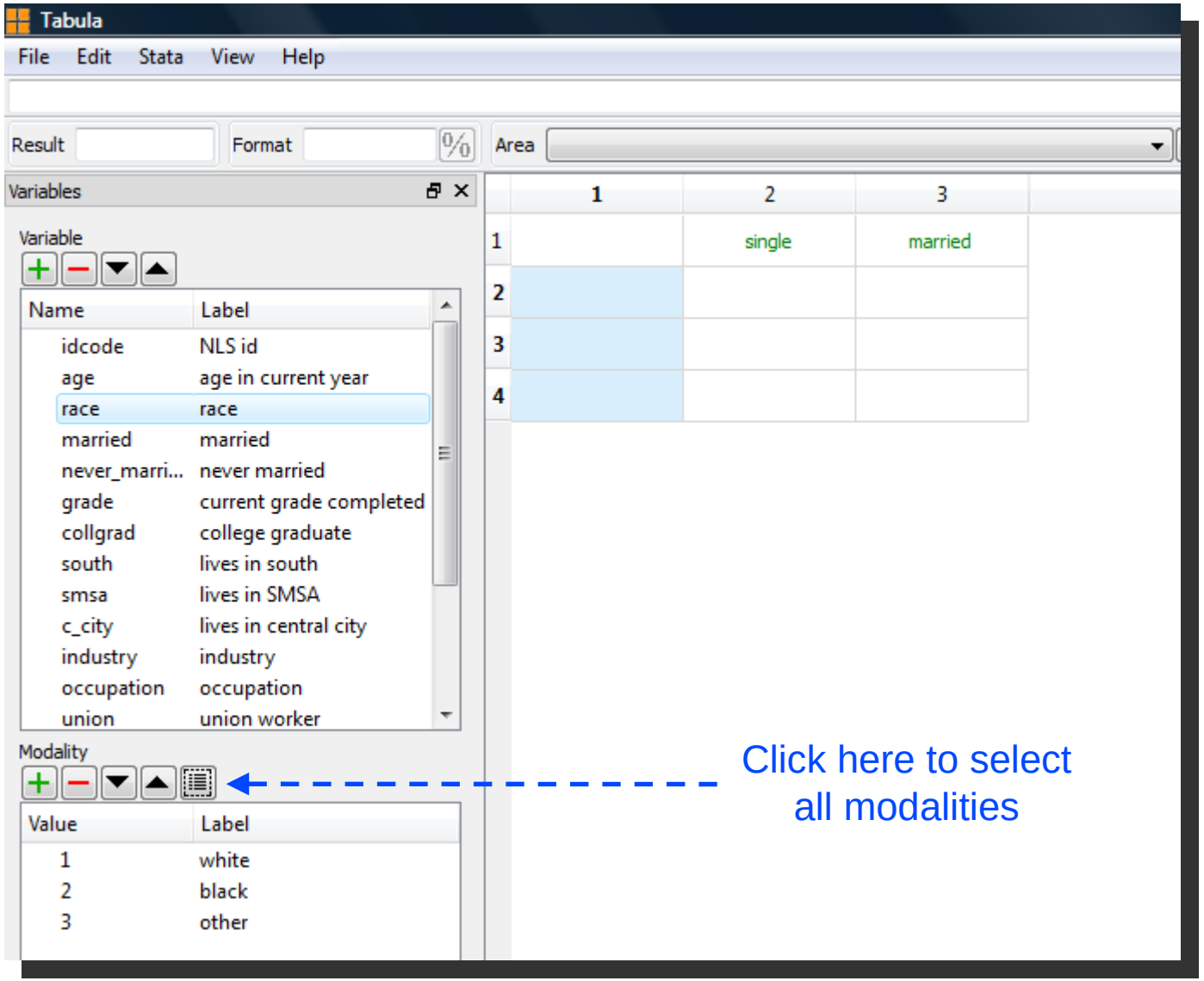
Quickly dragging and dropping a set of modalities

Step 1: select target cells



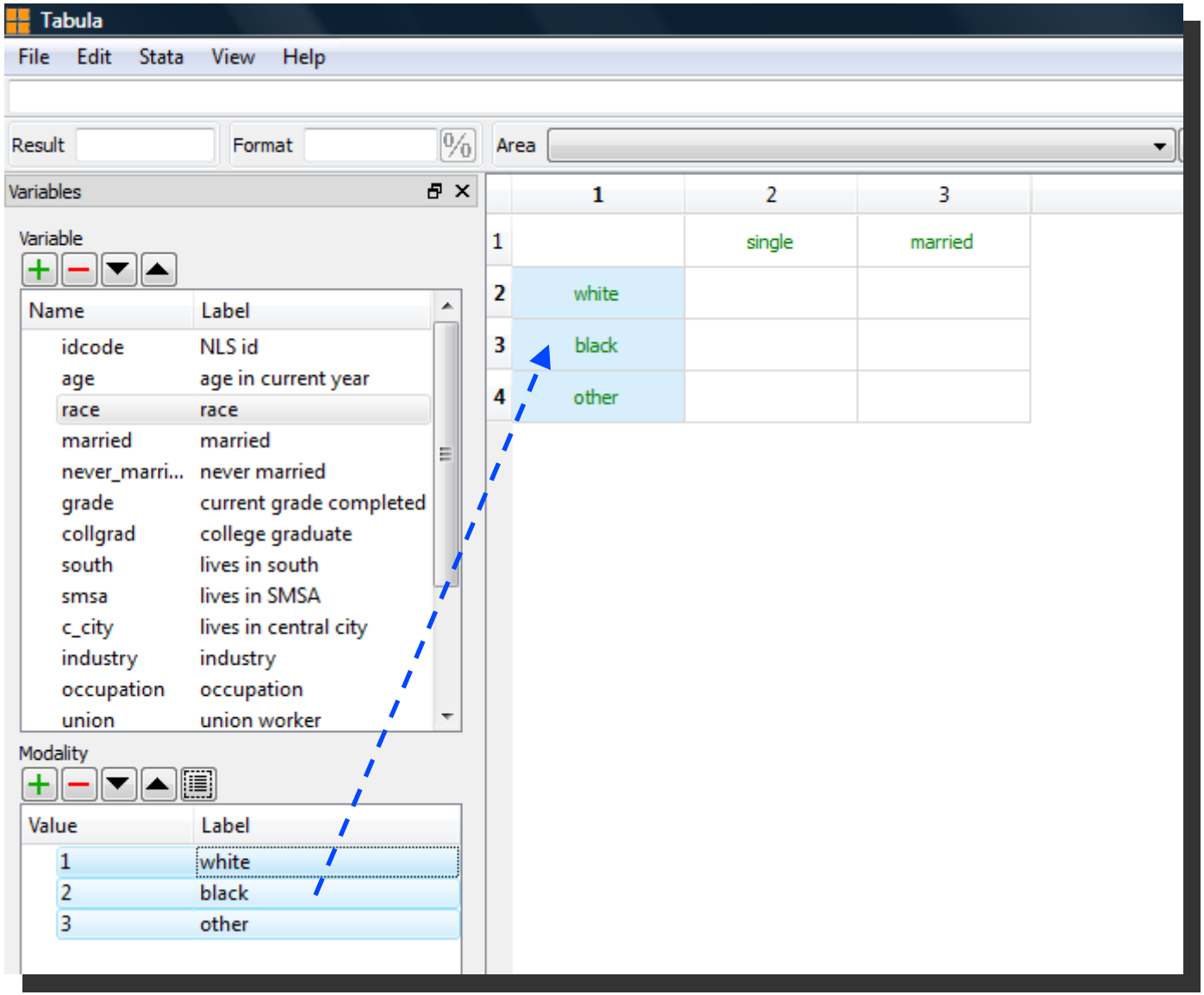
Quickly dragging and dropping a set of modalities

Step 2: select all modalities

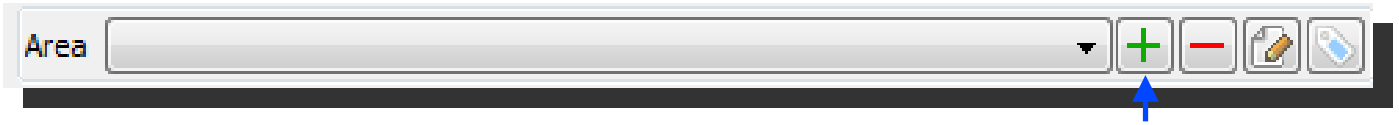


Quickly dragging and dropping a set of modalities

Step 3: drag and drop the previously selected set of modalities on the target selection

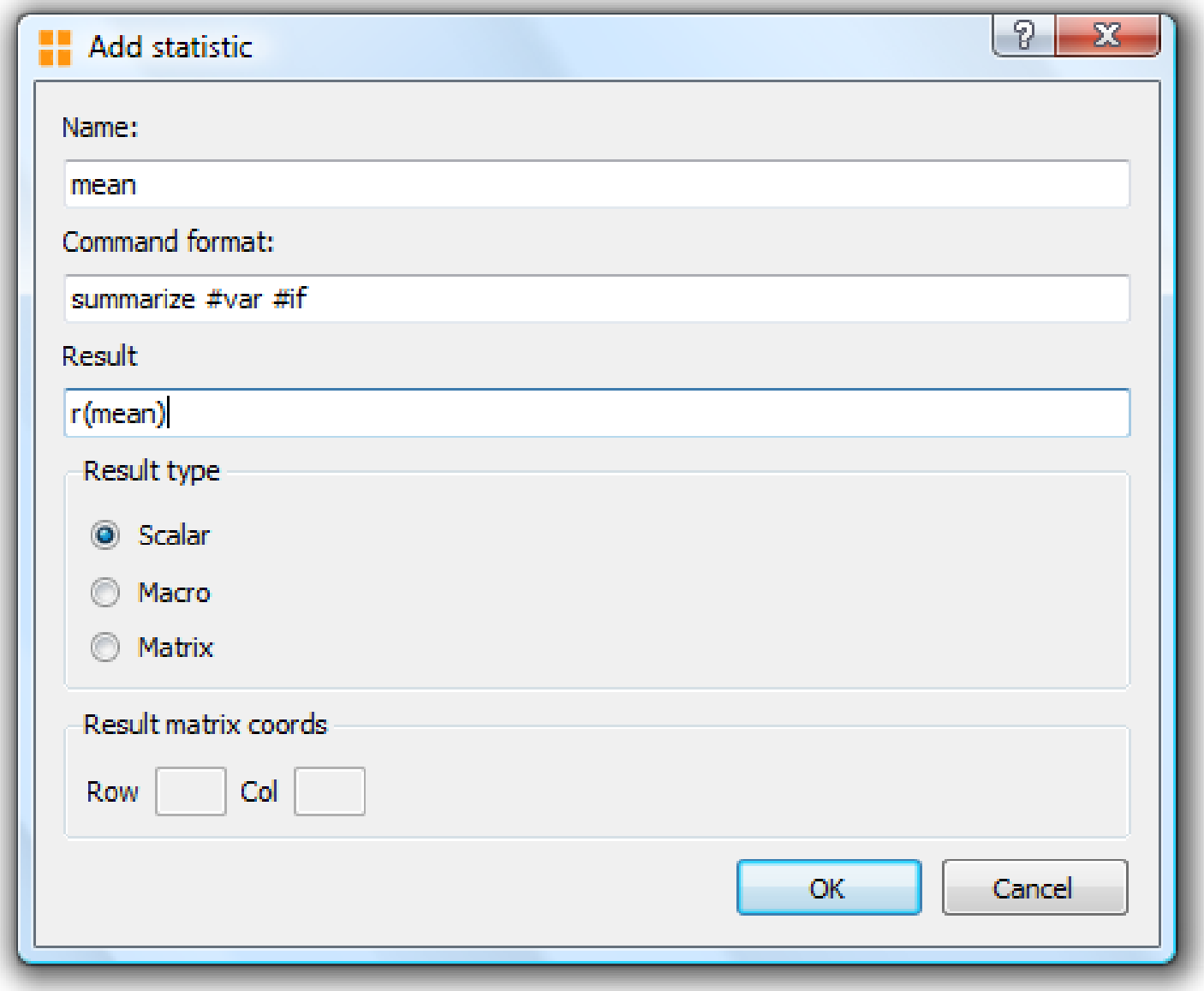


Creating your statistic



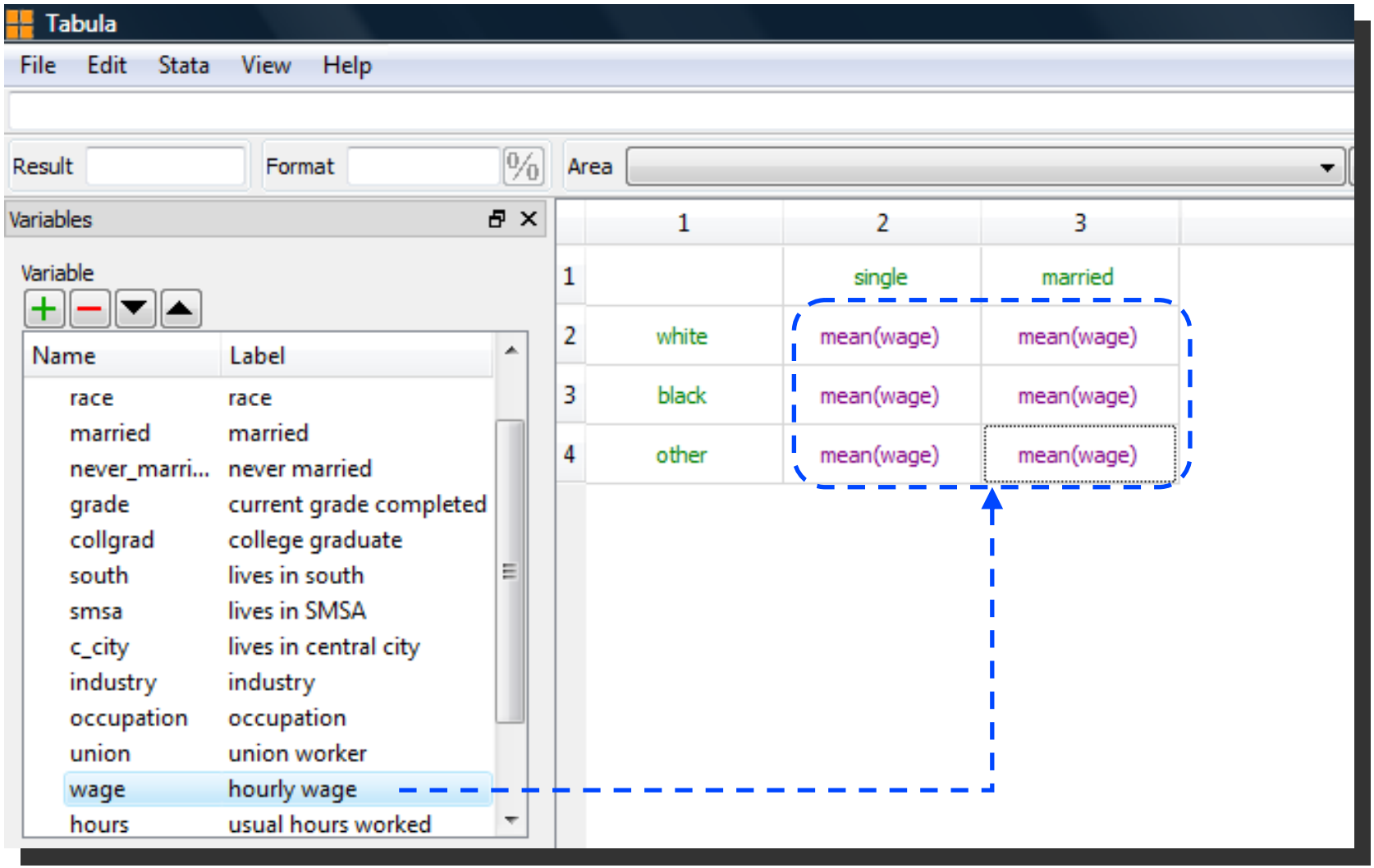
Click here to add a new statistic

Creating your statistic



Tabula will replace “#var” with the variable name and “#if” with the condition

Dragging and dropping variable on the table



Statistic “mean” must be selected before dragging and dropping

Let’s have a look at the cells

summarize wage if race==1 & married==0

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

summarize wage if race==1 & married==1

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

summarize wage if race==2 & married==0

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

summarize wage if race==2 & married==1

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

summarize wage if race==3 & married==0

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

summarize wage if race==3 & married==1

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

How Tabula creates the Stata do file

What you see:

	1	2	3
1		single	married
2	white	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)

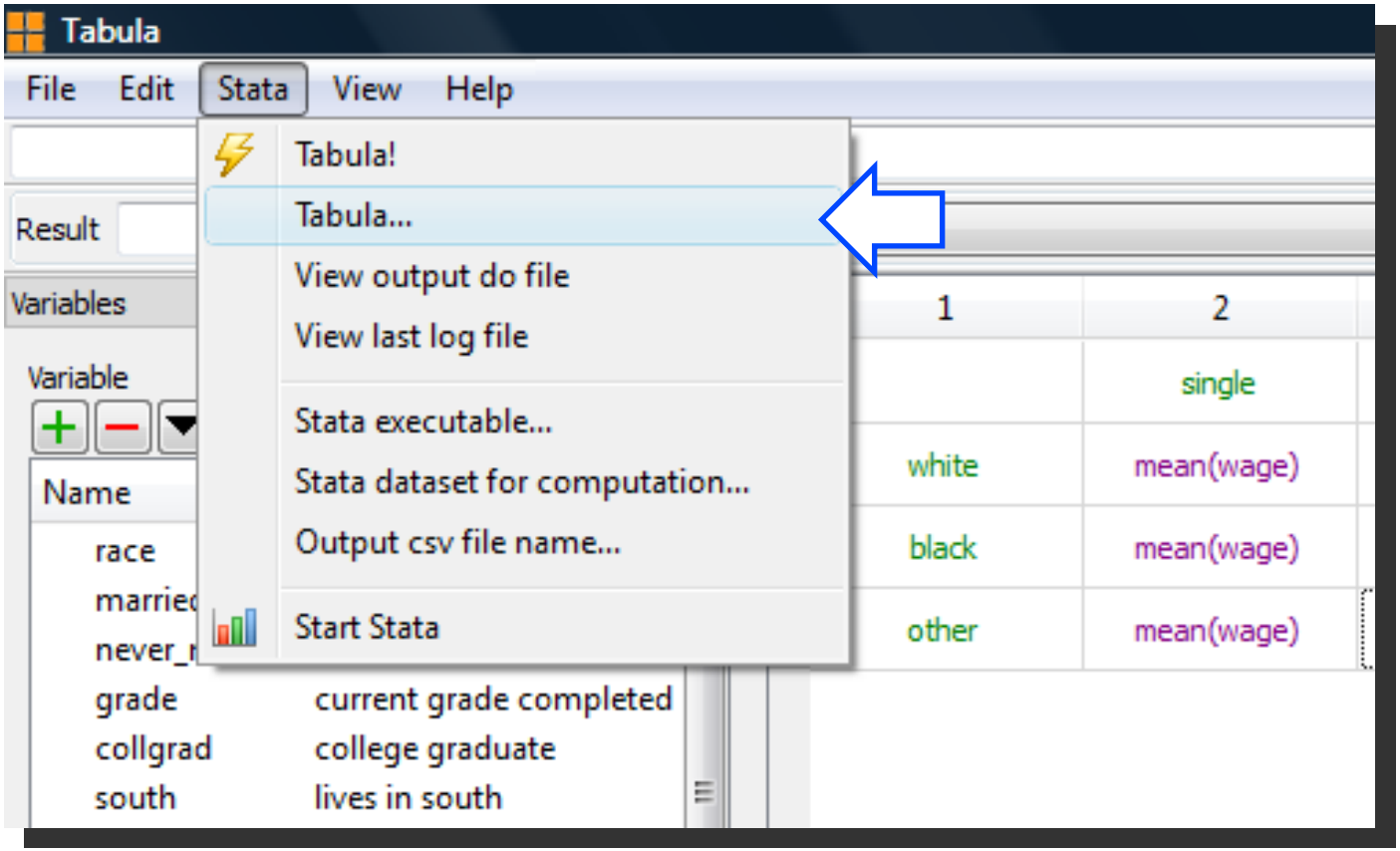
What Tabula creates (extract):

Computations

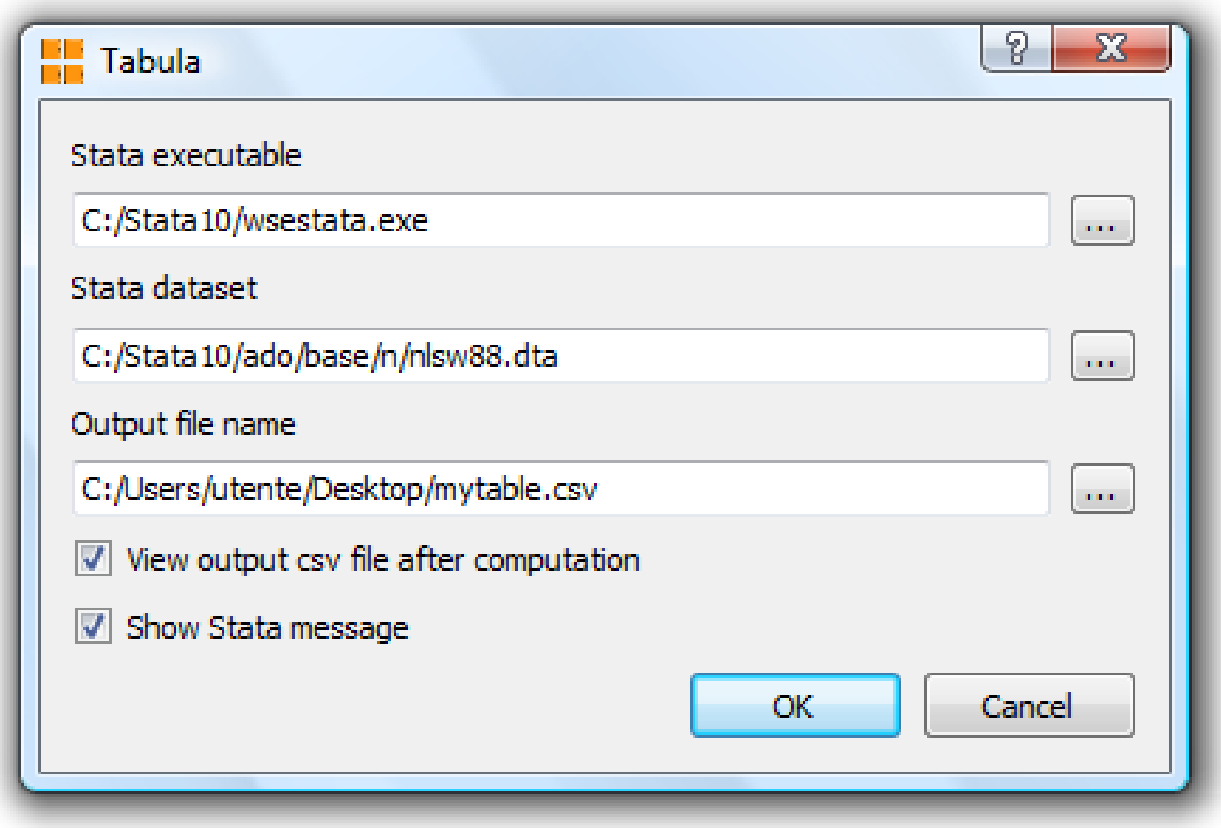
Writing CSV file

```
[…]
summarize wage if race==2 & married==0
local t_2_3: display r(mean)
[…]
forvalues row = 1/`nRow' {
  forvalues col = 1/`nCol' {
    file write outputFile “`t_`row’_ `col’’;”
  […]
  }
  […]
}
```

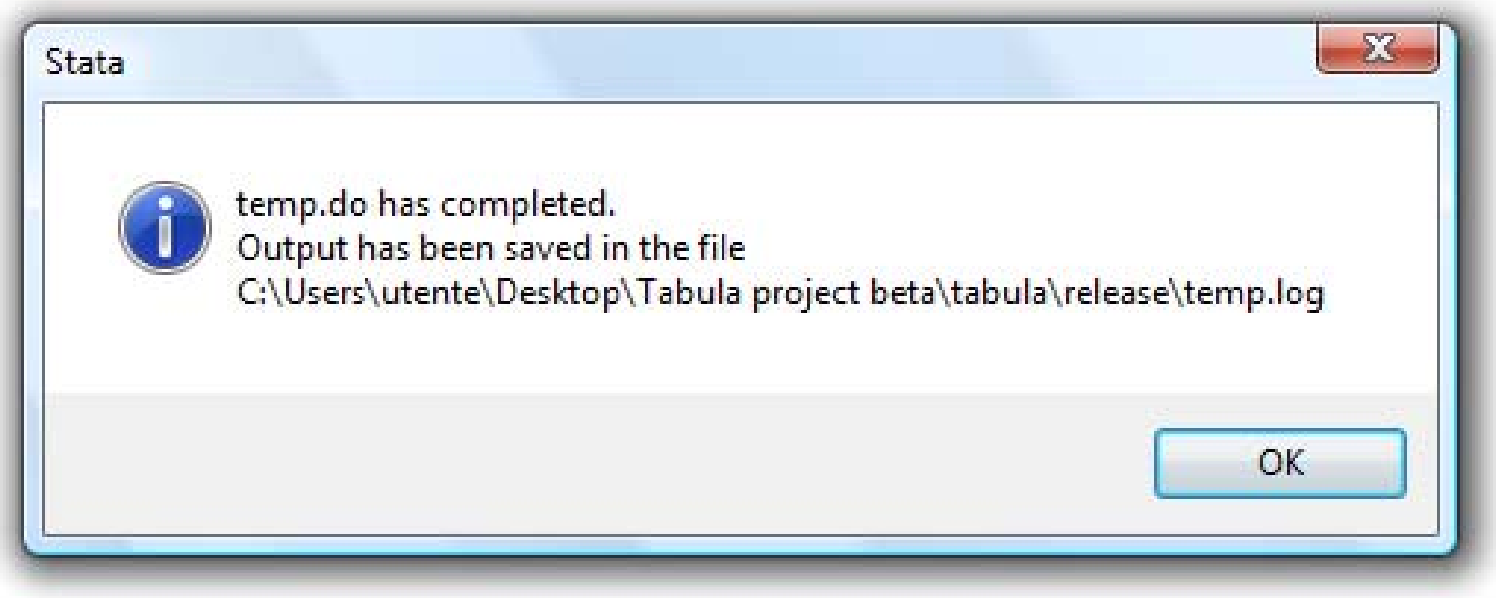
Let’s tabulate!



The “Tabula” dialog window



The Stata message after computation

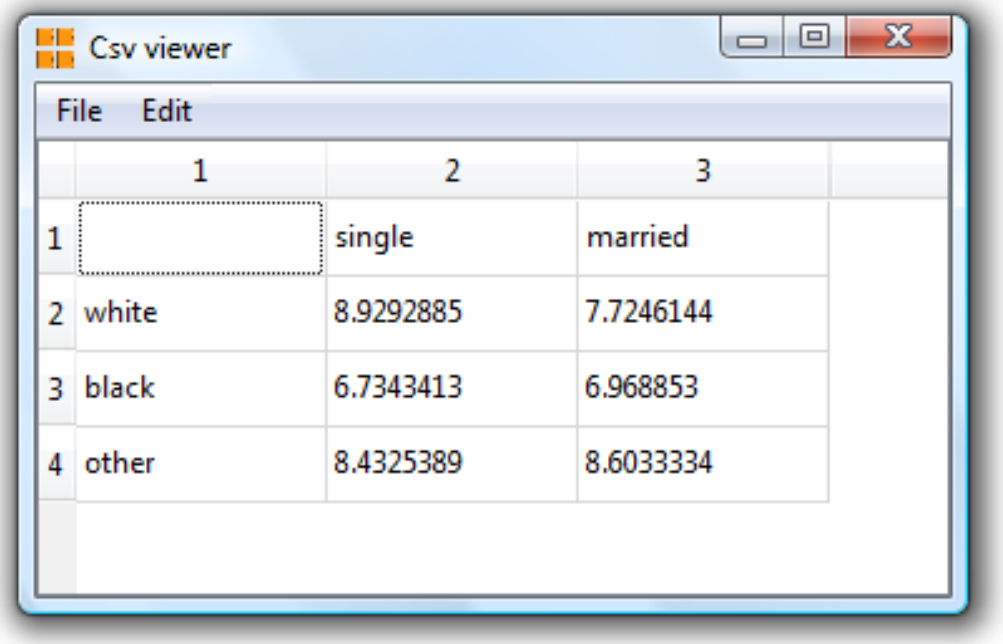


- Stata is executed in batch mode (Stata's GUI is not showed).
- You can suppress this message by unchecking the "Show Stata message" option in the "Tabula" dialog window.
- Stata saves a temp.log file containing the commands created by Tabula and the Stata's output.

The CSV table

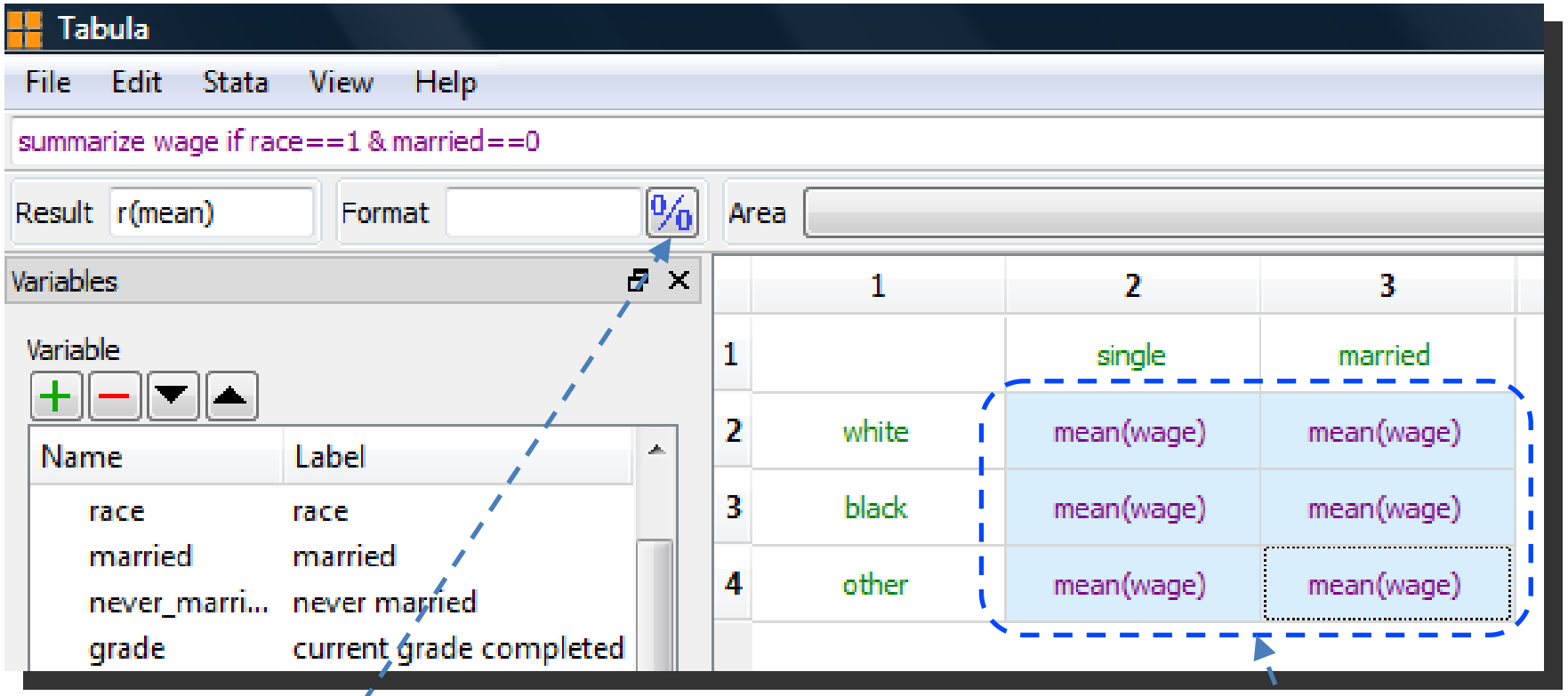
The output CSV file

```
;single;married
white;8.9292885;7.7246144
black;6.7343413;6.968853
other;8.4325389;8.6033334
```



- Tabula shows the output CSV file after Stata's computations.
- You can edit the text or copy cells to another software (for example Microsoft Excel or Microsoft Word).

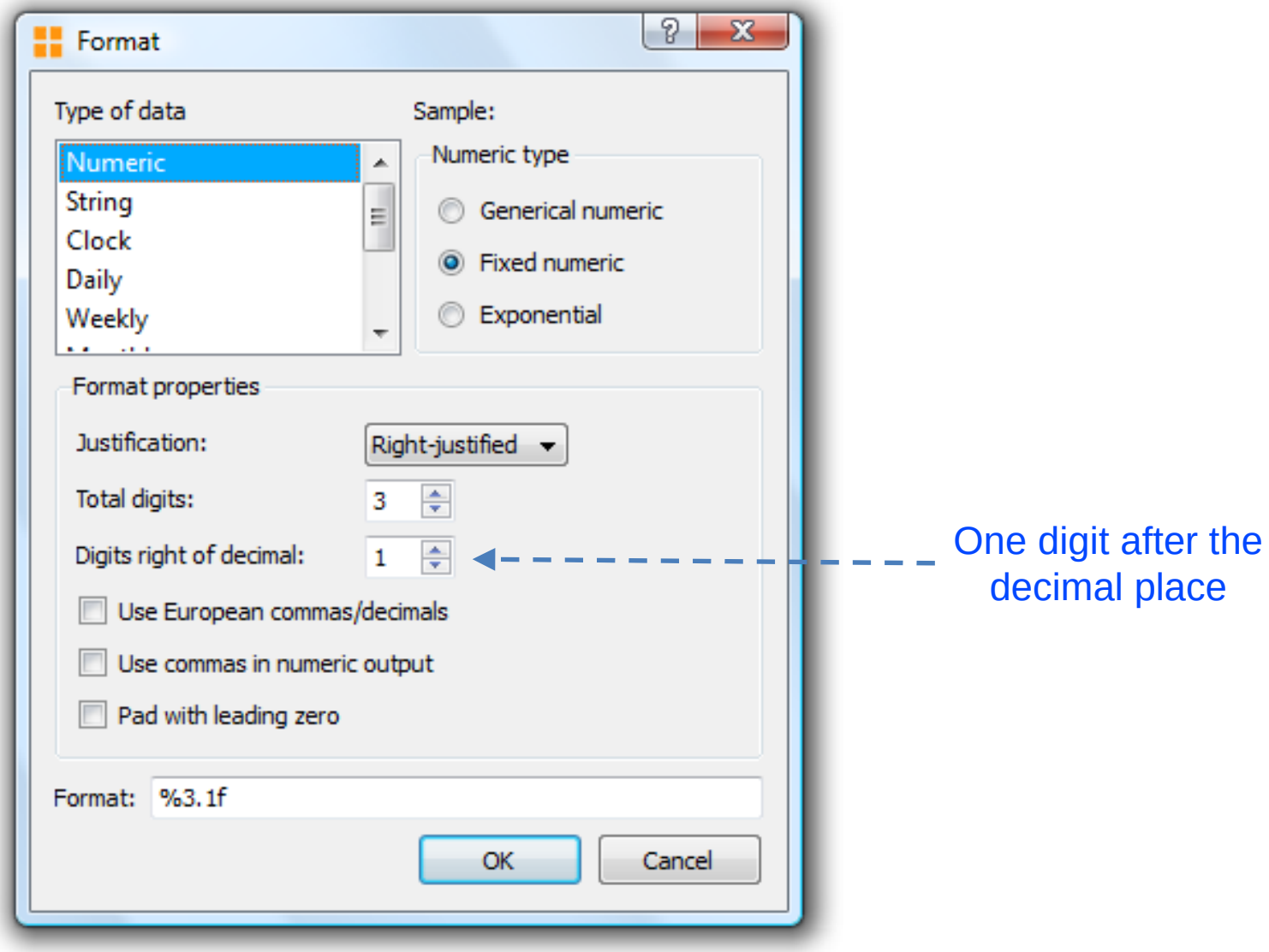
Setting variables' output format



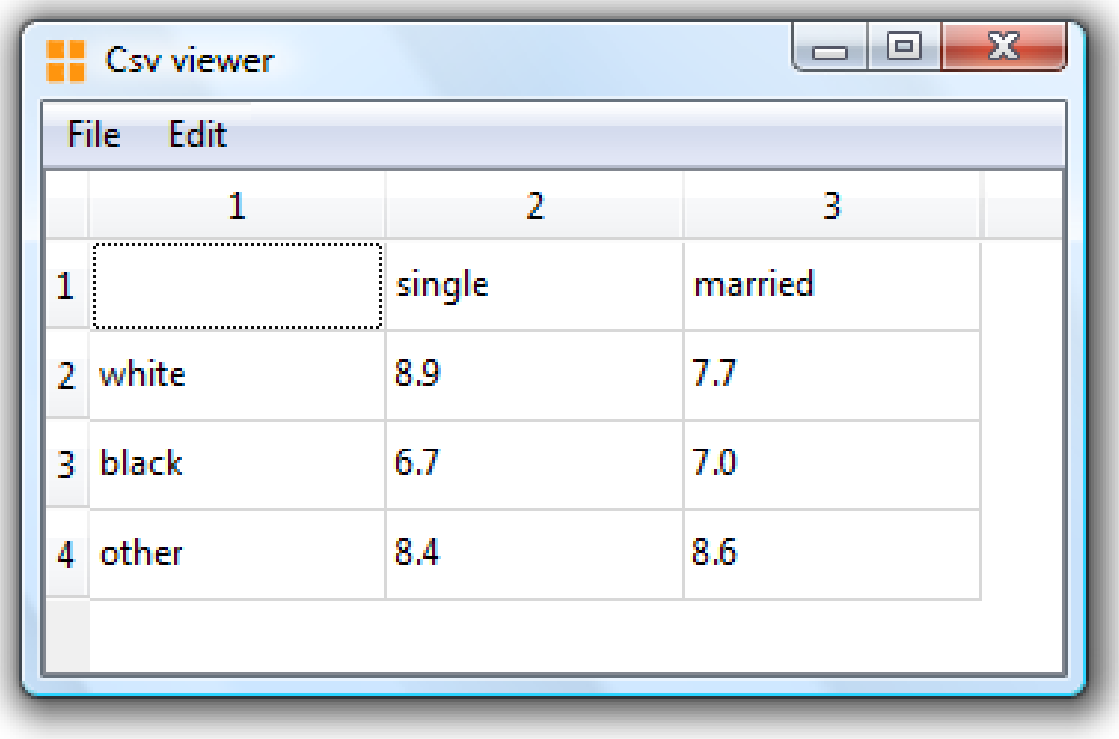
2) Click here to set variables' output format

1) Select the cells containing statistics

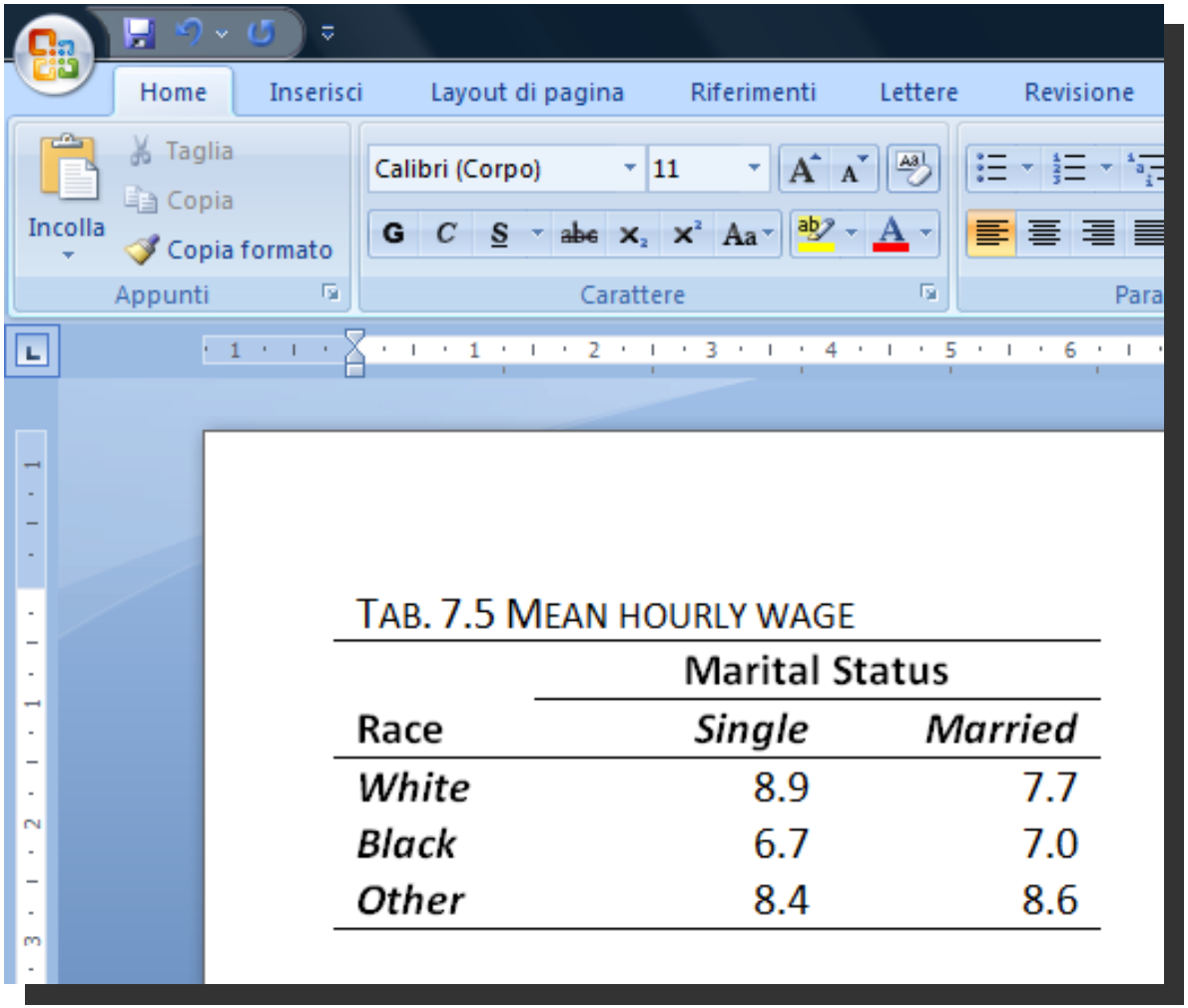
The format dialog window



The table with the desired variable’s output format



The final table edited in Microsoft Word



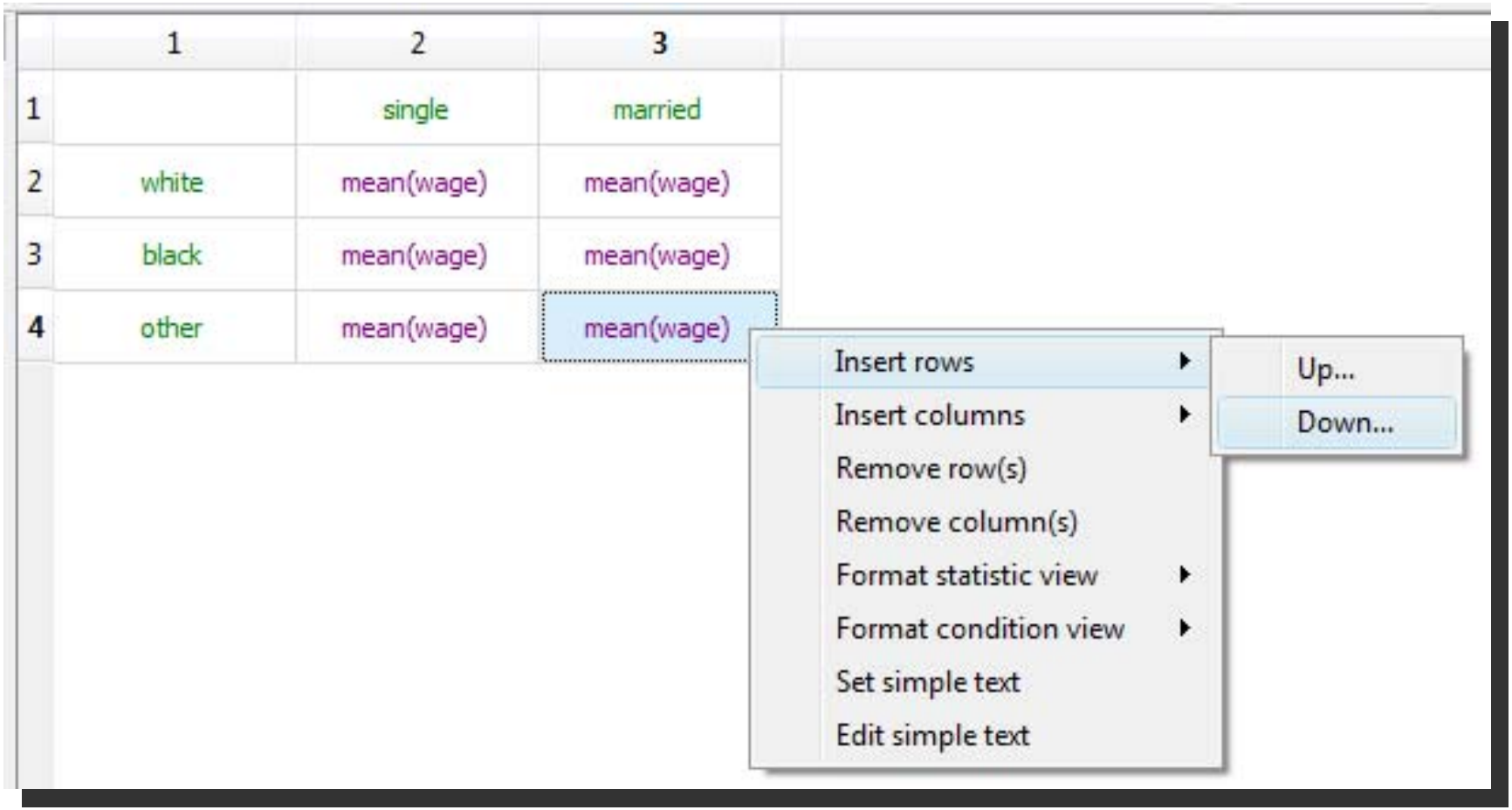
TAB. 7.5 MEAN HOURLY WAGE

	Marital Status	
Race	*Single*	*Married*
White	8.9	7.7
Black	6.7	7.0
Other	8.4	8.6

Ready for publication!

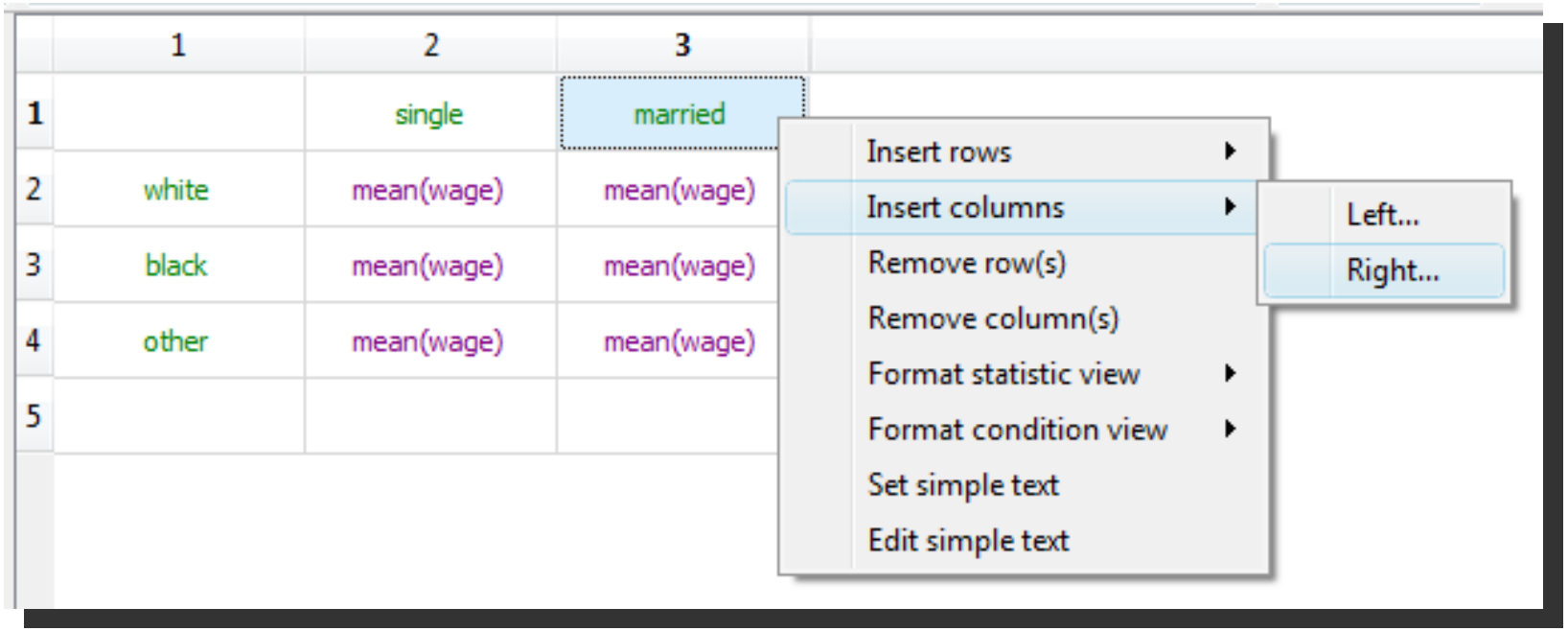
Adding marginal totals

Step 1: insert a new row



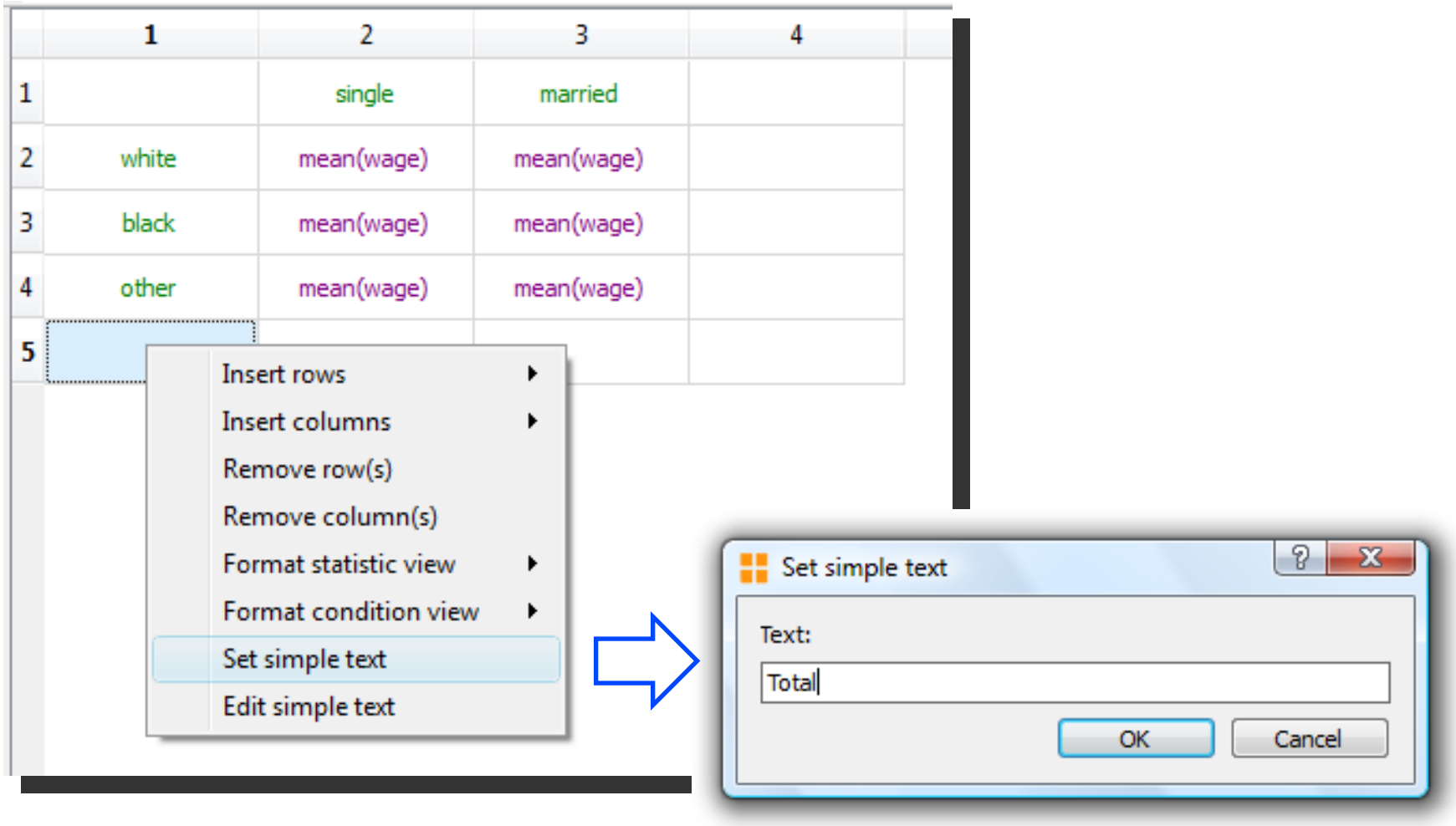
Adding marginal totals

Step 2: insert a new column



Adding marginal totals

Step 3: set simple text for the last row header



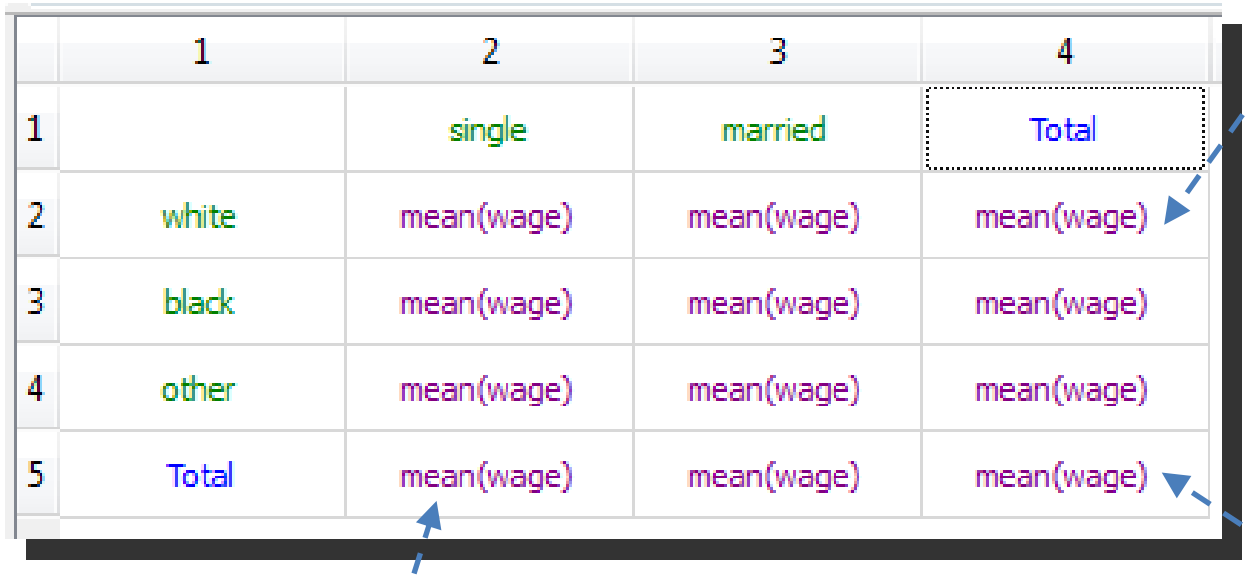
Adding marginal totals

Step 4: set simple text for the last column header

	1	2	3	4
1		single	married	Total
2	white	mean(wage)	mean(wage)	
3	black	mean(wage)	mean(wage)	
4	other	mean(wage)	mean(wage)	
5	Total			

Adding marginal totals

Step 5: fill cells with statistics



	1	2	3	4
1		single	married	Total
2	white	mean(wage)	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)	mean(wage)
5	Total	mean(wage)	mean(wage)	mean(wage)

summarize wage if race==1

summarize wage if married==0

summarize wage

Creating a more complex table

The final table is wrong

	1	2	3	4
1		not college grad	not college grad	not college grad
2		single	married	Total
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Total	mean(wage)	mean(wage)	mean(wage)
7				
8		college grad	college grad	college grad
9		single	married	Total
10	white	mean(wage)	mean(wage)	mean(wage)
11	black	mean(wage)	mean(wage)	mean(wage)
12	other	mean(wage)	mean(wage)	mean(wage)
13	Total	mean(wage)	mean(wage)	mean(wage)

```
summarize wage if
race==2 & collgrad==0
& married==1
```

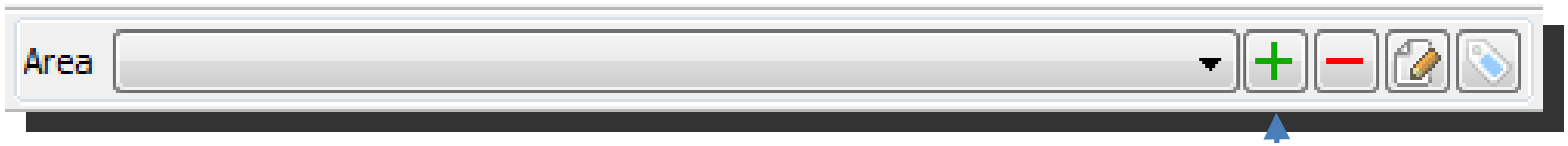
Right!

```
summarize wage if
race==2 & collgrad==0
& married==1 &
collgrad==1 &
married==1
```

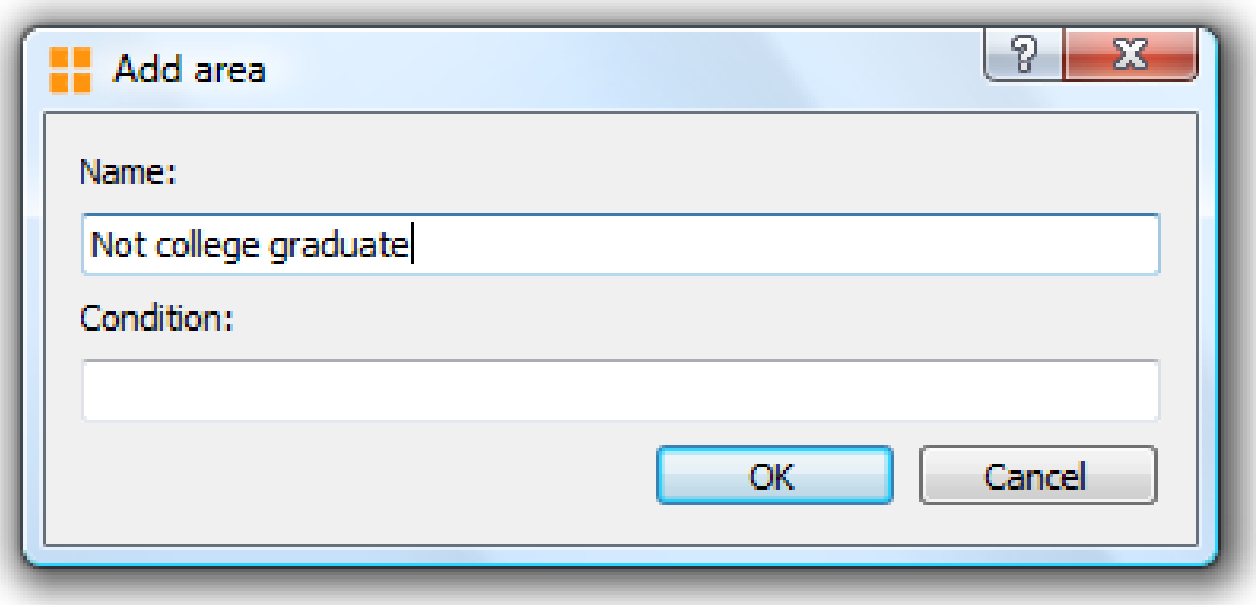
Wrong!

Assigning areas to cells

Step 1: add a new area



Click here



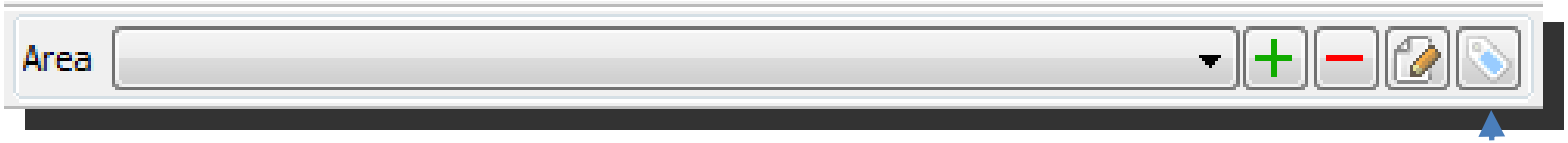
Assigning areas to cells

Step 2: select top part of the table

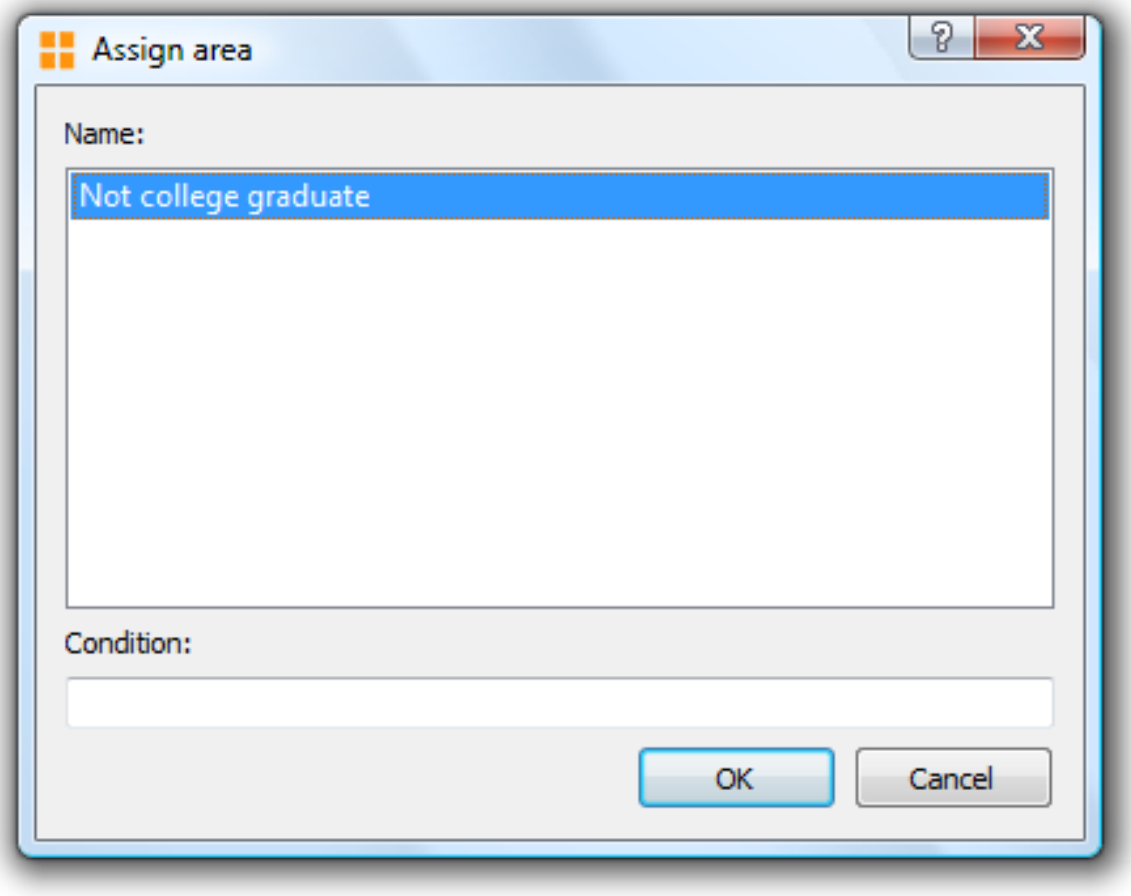
	1	2	3	4
1		not college grad	not college grad	not college grad
2		single	married	Total
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Total	mean(wage)	mean(wage)	mean(wage)
7				
8		college grad	college grad	college grad
9		single	married	Total
10	white	mean(wage)	mean(wage)	mean(wage)
11	black	mean(wage)	mean(wage)	mean(wage)
12	other	mean(wage)	mean(wage)	mean(wage)
13	Total	mean(wage)	mean(wage)	mean(wage)

Assigning areas to cells

Step 3: assign “Not college graduate” area to the top part of the table

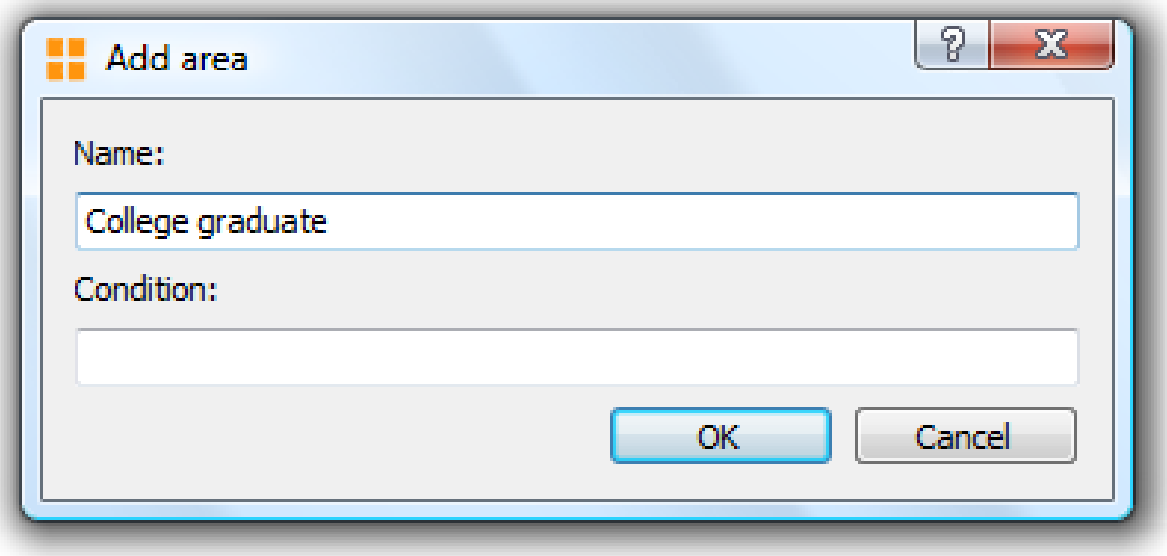


Click here



Assigning areas to cells

Step 4: add a new area



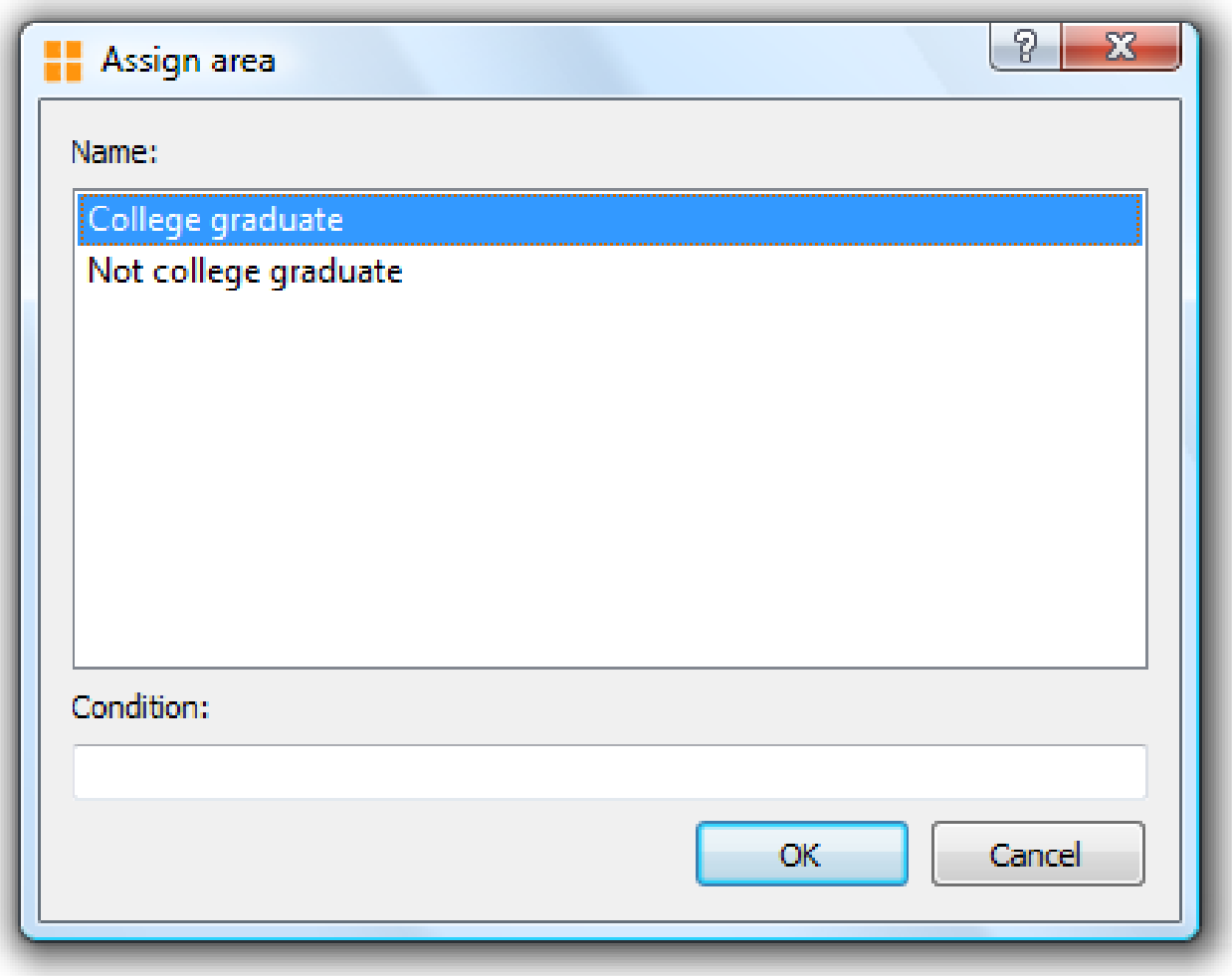
Assigning areas to cells

Step 5: select bottom part of the table

	1	2	3	4
1		not college grad	not college grad	not college grad
2		single	married	Total
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Total	mean(wage)	mean(wage)	mean(wage)
7				
8		college grad	college grad	college grad
9		single	married	Total
10	white	mean(wage)	mean(wage)	mean(wage)
11	black	mean(wage)	mean(wage)	mean(wage)
12	other	mean(wage)	mean(wage)	mean(wage)
13	Total	mean(wage)	mean(wage)	mean(wage)

Assigning areas to cells

Step 6: assign “College graduate” area to the bottom part of the table



Assigning areas to cells

The final table is OK

	1	2	3	4
1		not college grad	not college grad	not college grad
2		single	married	Total
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Total	mean(wage)	mean(wage)	mean(wage)
7				
8		college grad	college grad	college grad
9		single	married	Total
10	white	mean(wage)	mean(wage)	mean(wage)
11	black	mean(wage)	mean(wage)	mean(wage)
12	other	mean(wage)	mean(wage)	mean(wage)
13	Total	mean(wage)	mean(wage)	mean(wage)

```
summarize wage if
race==2 & collgrad==0
& married==1
```

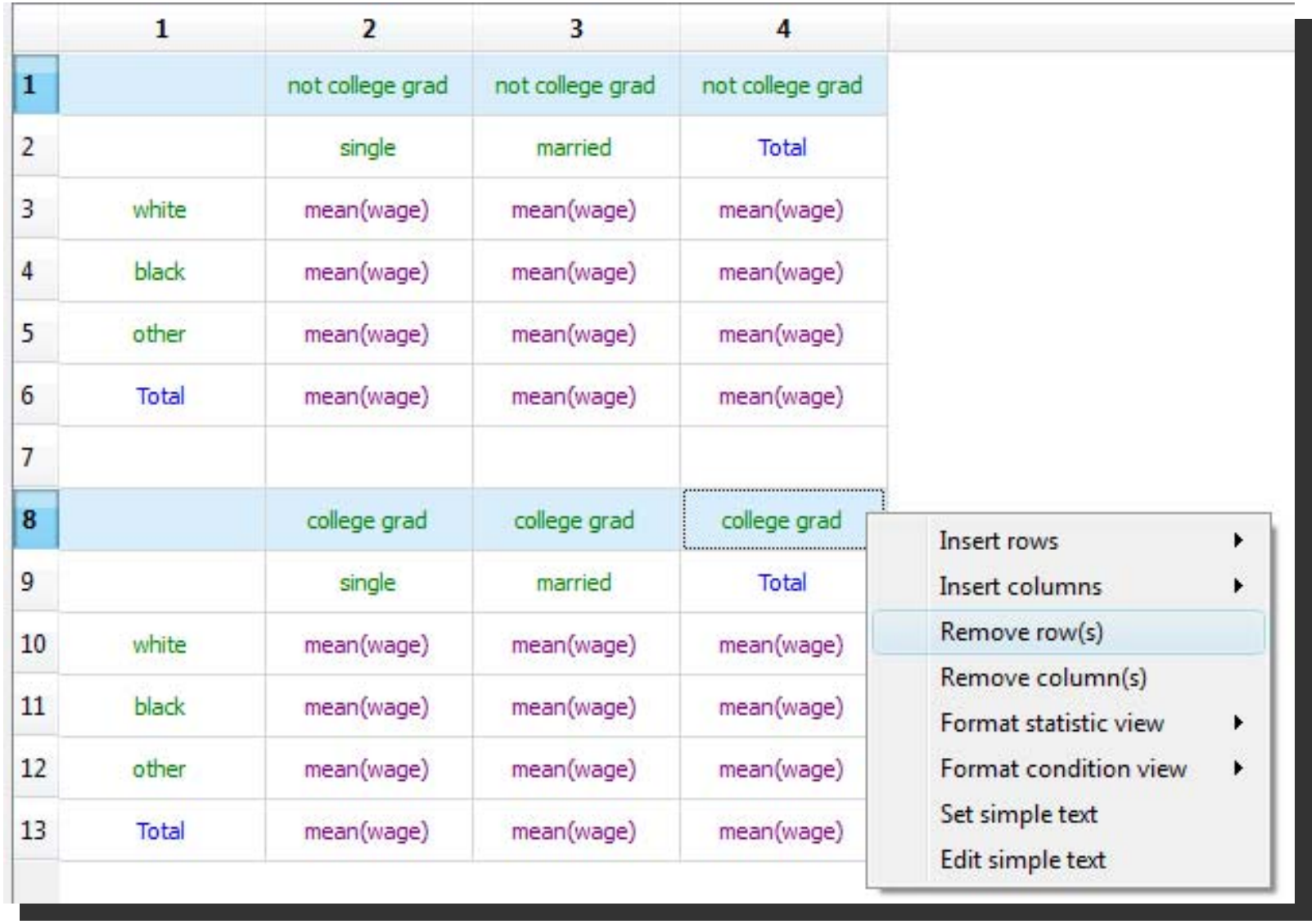
Right!

```
summarize wage if
race==2 & collgrad==1
& married==1
```

Right!

Using area conditions

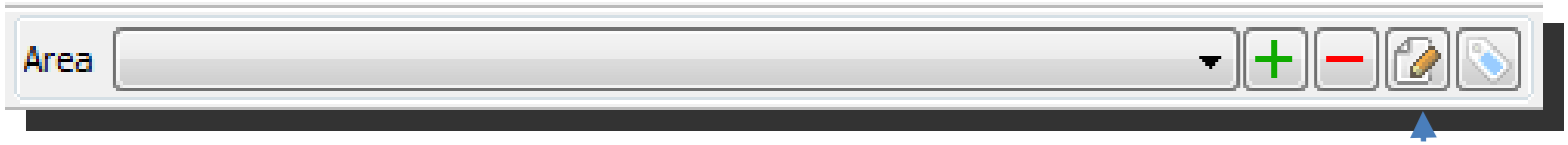
Step 1: remove rows



	1	2	3	4
1		not college grad	not college grad	not college grad
2		single	married	Total
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Total	mean(wage)	mean(wage)	mean(wage)
7				
8		college grad	college grad	college grad
9		single	married	Total
10	white	mean(wage)	mean(wage)	mean(wage)
11	black	mean(wage)	mean(wage)	mean(wage)
12	other	mean(wage)	mean(wage)	mean(wage)
13	Total	mean(wage)	mean(wage)	mean(wage)

Using area conditions

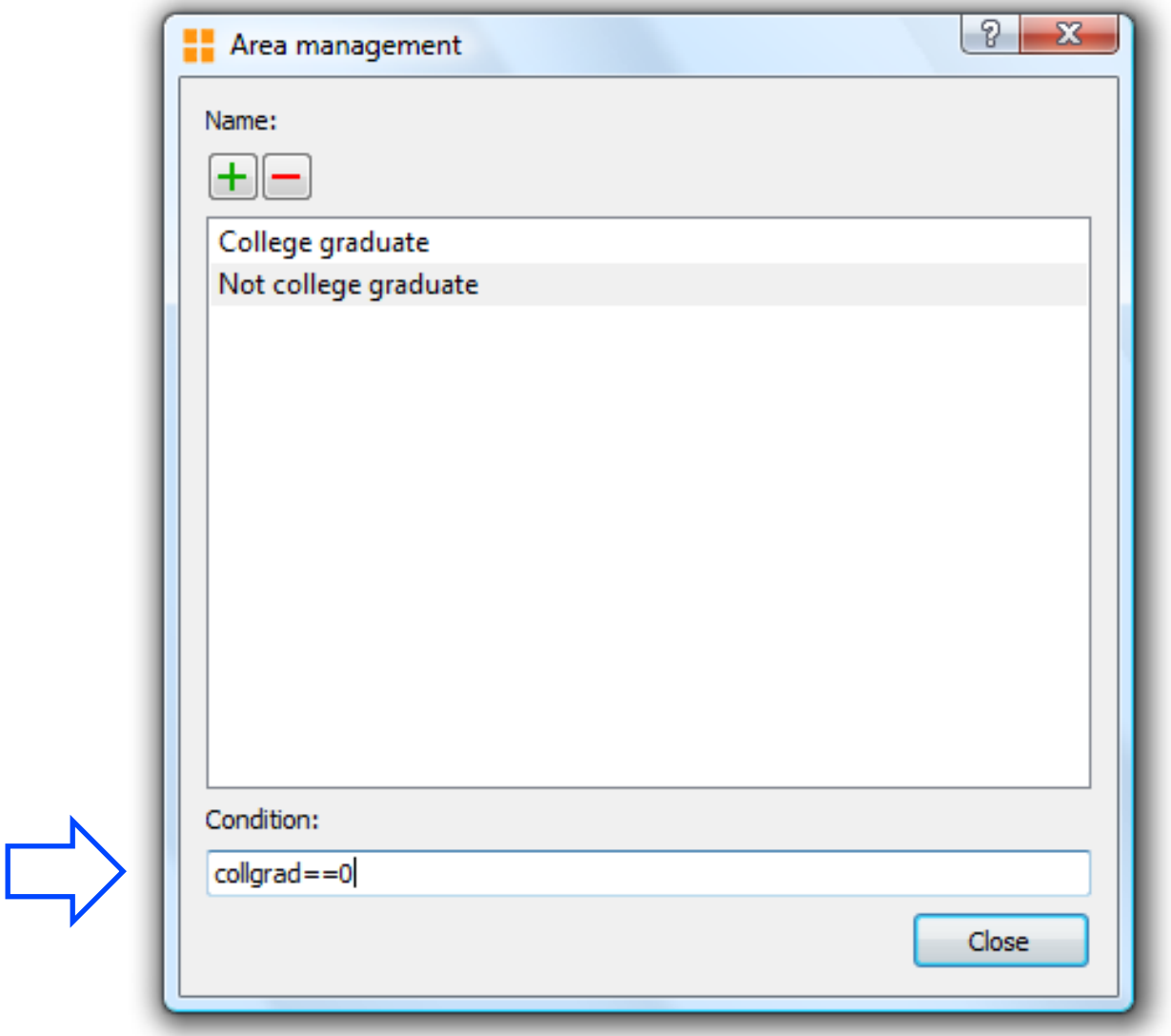
Step 2: manage areas



Click here

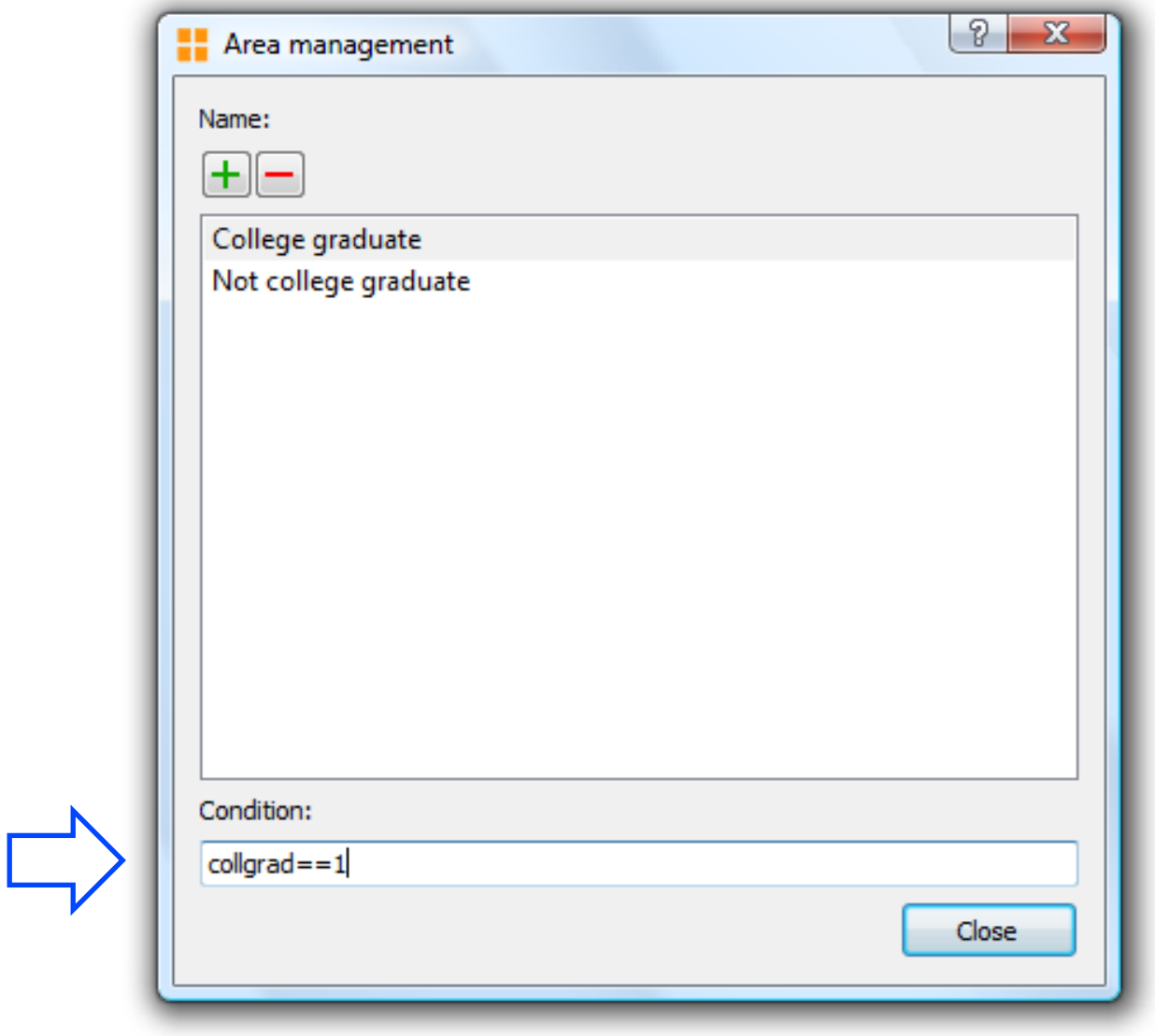
Using area conditions

Step 3: set condition for “Not college graduate” area



Using area conditions

Step 4: set area condition for “College graduate” area



Using area conditions

The final table is OK

	1	2	3	4
1		single	married	Total
2	white	mean(wage)	mean(wage)	mean(wage)
3	black	mean(wage)	mean(wage)	mean(wage)
4	other	mean(wage)	mean(wage)	mean(wage)
5	Total	mean(wage)	mean(wage)	mean(wage)
6				
7		single	married	Total
8	white	mean(wage)	mean(wage)	mean(wage)
9	black	mean(wage)	mean(wage)	mean(wage)
10	other	mean(wage)	mean(wage)	mean(wage)
11	Total	mean(wage)	mean(wage)	mean(wage)

```
summarize wage if
(collgrad==1) &
race==2 & married==1
```

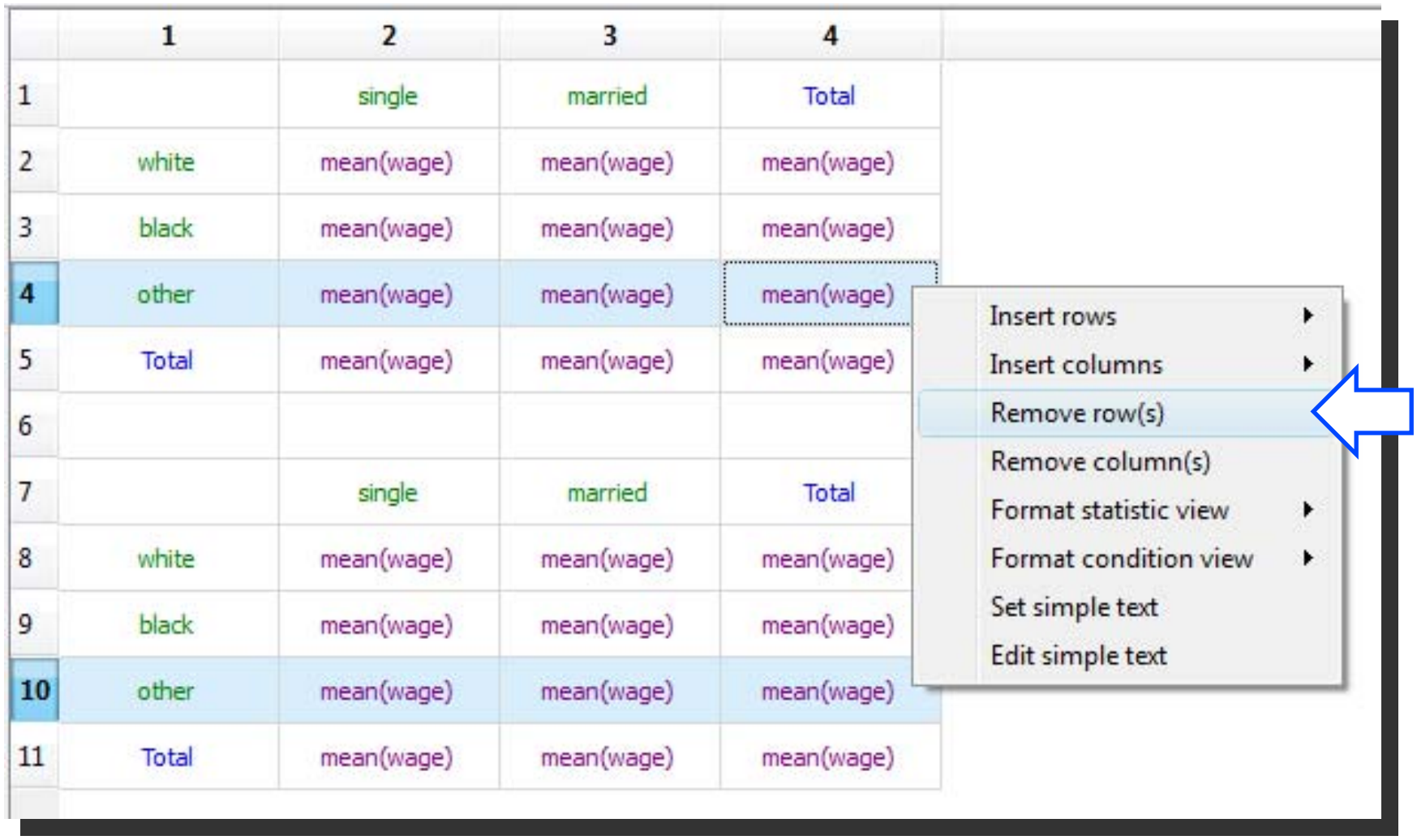
Right!

```
summarize wage if
(collgrad==0) &
race==2 & married==1
```

Right!

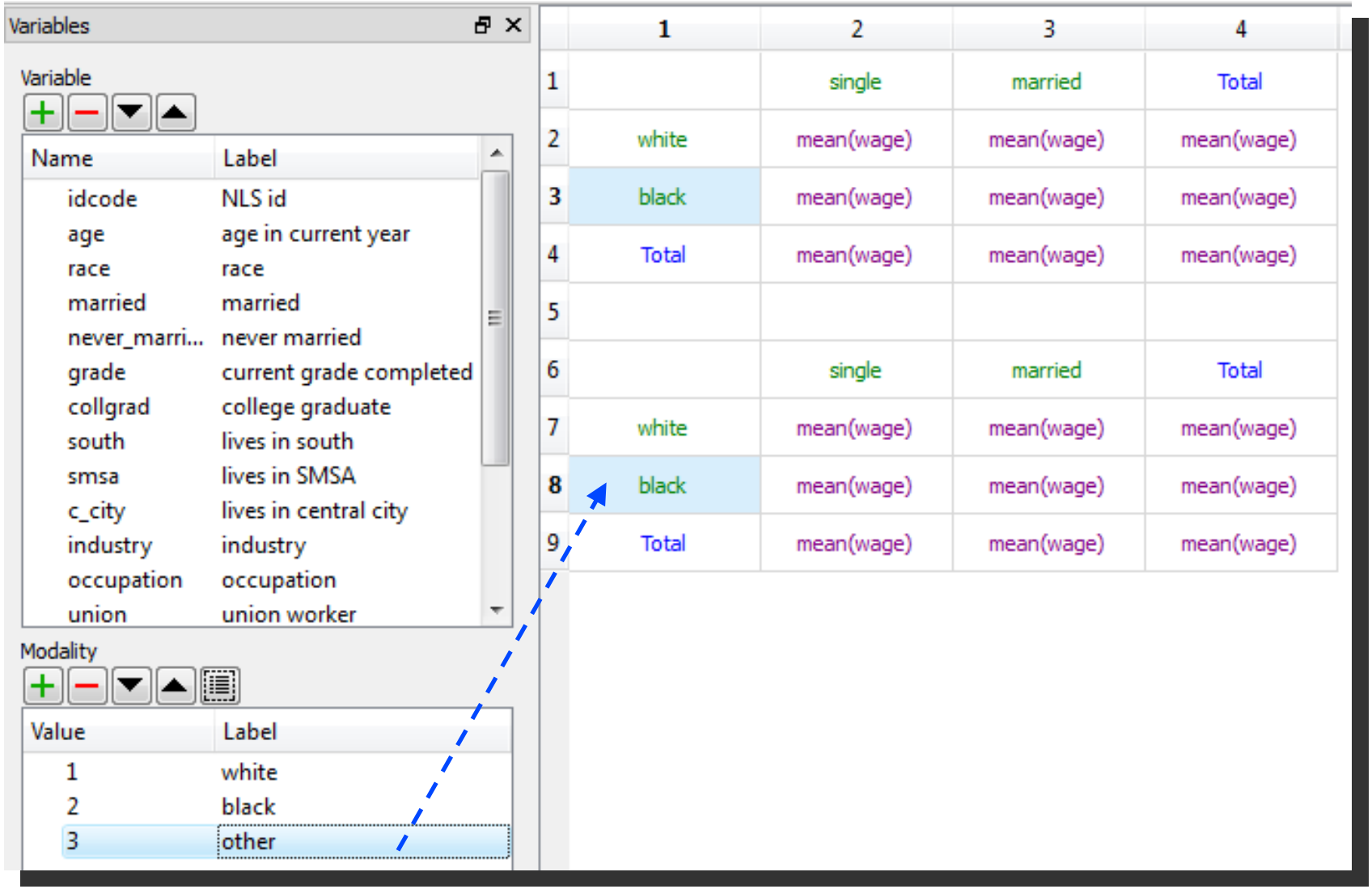
Using the OR logical operator

Step 1: remove rows 4 and 10



Using the OR logic operator

Step 2: drag and drop “other” modality in labels named “black”



Using the OR logic operator

The final table

	1	2	3	4
1		single	married	Total
2	white	mean(wage)	mean(wage)	mean(wage)
3	black | other	mean(wage)	mean(wage)	mean(wage)
4	Total	mean(wage)	mean(wage)	mean(wage)
5				
6		single	married	Total
7	white	mean(wage)	mean(wage)	mean(wage)
8	black | other	mean(wage)	mean(wage)	mean(wage)
9	Total	mean(wage)	mean(wage)	mean(wage)

```
summarize wage if (collgrad==0) & (race==2 | race==3) & married==1
```

Combining text and numbers in a table

Step 1: create the “smallsize.ado” file and put it in an ADO path

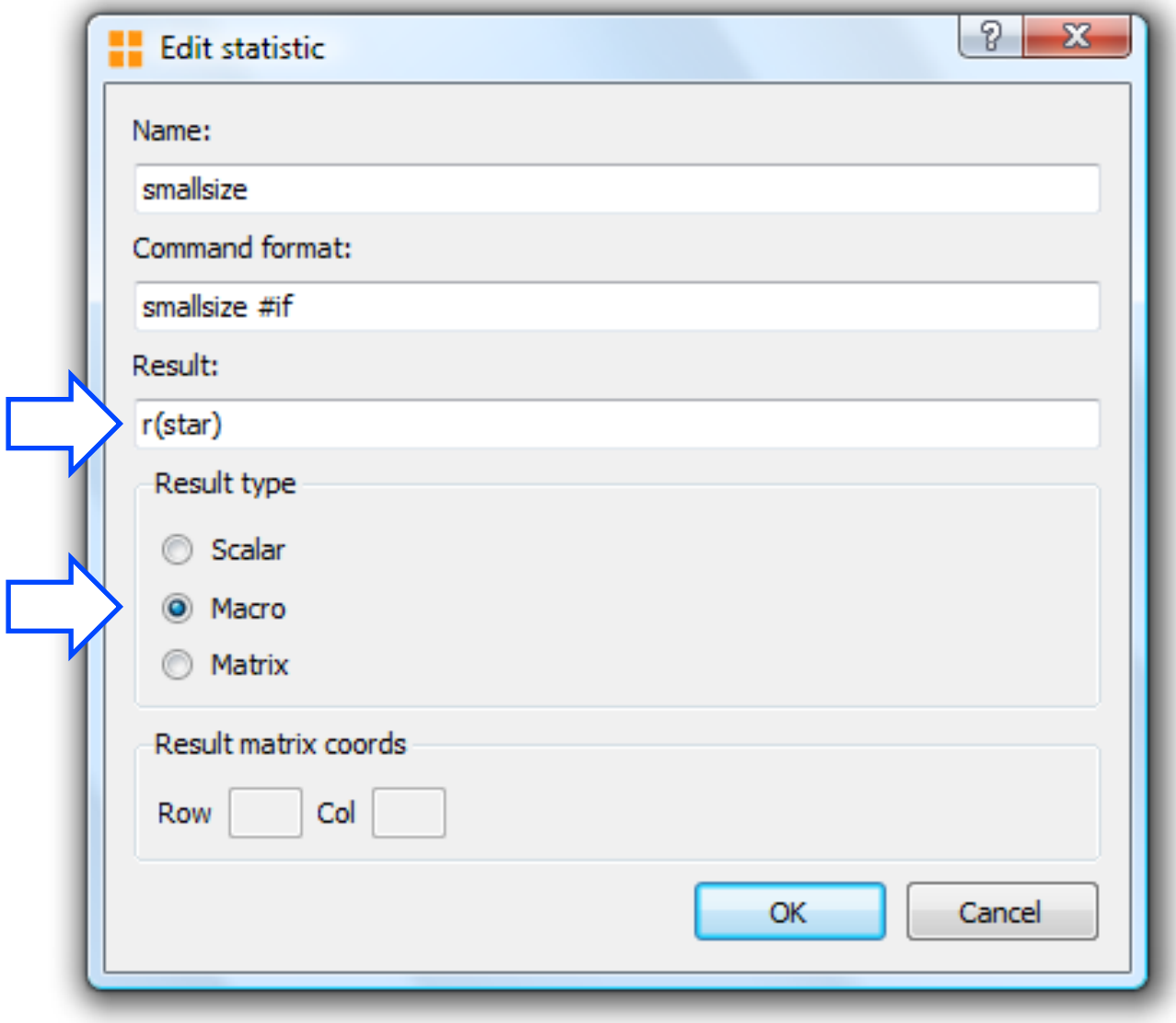
smallsize.ado

```
program define smallsize, rclass
        syntax [if]
        quietly count `if'
        if (r(N) < 60) {
                return local star "(*)"
        }
        else {
                return local star “ "
        }
end
```

This ado program returns “(*)” if the number of observations satisfying the “if” condition is less than 60

Combining text and numbers in a table

Step 2: create the “smallsize” statistic with “macro” result selected



Combining text and numbers in a table

Step 3: create a table like this

	1	2	3	4	5
1		single	single	married	married
2	Ag/Forestry/Fisheries	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
3	Mining	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
4	Construction	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
5	Manufacturing	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
6	Transport/Comm/Utility	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
7	Wholesale/Retail Trade	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
8	Finance/Ins/Real Estate	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
9	Business/Repair Svc	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
10	Personal Services	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
11	Entertainment/Rec Svc	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
12	Professional Services	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)
13	Public Administration	mean(wage)	smallsize(wage)	mean(wage)	smallsize(wage)

Combining text and numbers in a table

The final table

Csv viewer

File Edit

	1	2	3	4	5
1		single	single	married	married
2	Ag/Forestry/Fisheries	2.3	(*)	6.3	(*)
3	Mining	17.2	(*)	9.7	(*)
4	Construction	8.1	(*)	7.2	(*)
5	Manufacturing	7.7		7.3	
6	Transport/Comm/Utility	12.0	(*)	10.9	(*)
7	Wholesale/Retail Trade	6.5		5.9	
8	Finance/Ins/Real Estate	11.1	(*)	9.3	
9	Business/Repair Svc	5.6	(*)	8.5	(*)
10	Personal Services	4.4	(*)	4.4	(*)
11	Entertainment/Rec Svc	7.9	(*)	5.4	(*)
12	Professional Services	8.5		7.6	
13	Public Administration	9.5		8.9	

Further examples: a 5-way table

	1	2	3	4
1		single	married	Total
2	Race			
3	white	mean(wage)	mean(wage)	mean(wage)
4	black	mean(wage)	mean(wage)	mean(wage)
5	other	mean(wage)	mean(wage)	mean(wage)
6	Labor union			
7	nonunion	mean(wage)	mean(wage)	mean(wage)
8	union	mean(wage)	mean(wage)	mean(wage)
9	Degree			
10	not college grad	mean(wage)	mean(wage)	mean(wage)
11	college grad	mean(wage)	mean(wage)	mean(wage)
12	Population density			
13	nonSMSA	mean(wage)	mean(wage)	mean(wage)
14	SMSA	mean(wage)	mean(wage)	mean(wage)
15	Total	mean(wage)	mean(wage)	mean(wage)

Further examples: different statistics in the same table

	1	2	3	4	5	6	7
1		single	single	single	married	married	married
2		Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
3	Professional/technical	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
4	Managers/admin	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
5	Sales	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
6	Clerical/unskilled	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
7	Craftsmen	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
8	Operatives	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
9	Transport	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
10	Laborers	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
11	Farmers	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
12	Farm laborers	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
13	Service	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
14	Household workers	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
15	Other	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)
16	Total	mean(wage)	median(wage)	sd(wage)	mean(wage)	median(wage)	sd(wage)

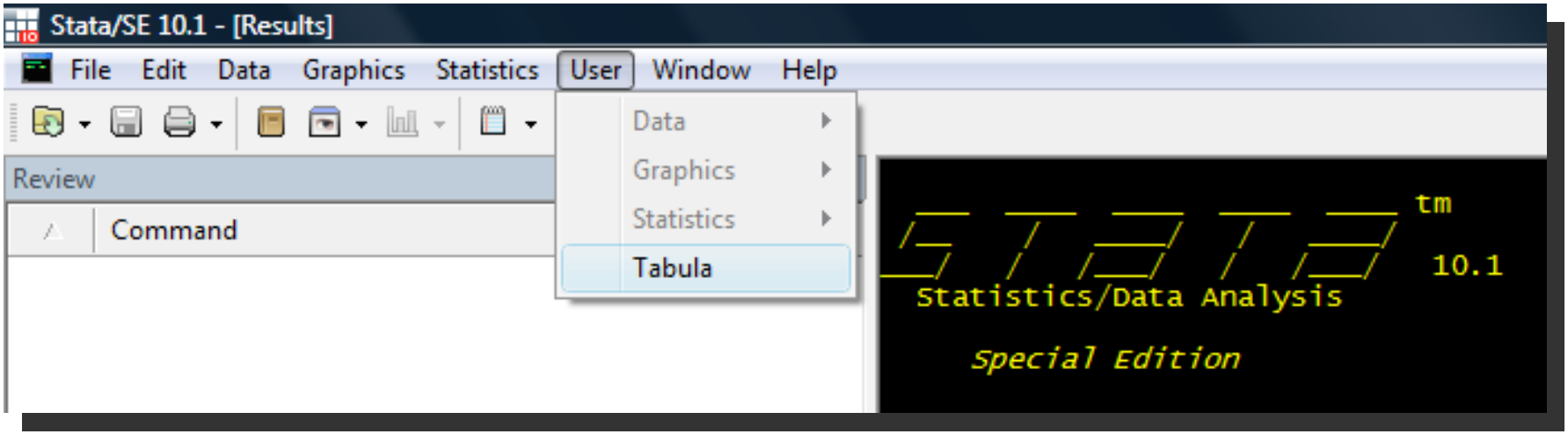
Tip #1: How to call Tabula from Stata

What you need is this useful ado file:
tabula_.ado

```
program define tabula_
  display
  display as text "Note: Tabula will open the last saved dataset"
  display as text "Check if your dataset was saved"
  winexec "C:\Program Files\Tabula 0.3 beta\tabula 0.3 beta.exe" "$S_FN"
end
```

- By typing “tabula_” from Stata you can call Tabula that open the last saved data set.
- Please modify the Tabula executable’s path in the ADO file according to your path.

Tip #2: How to call Tabula from the Stata's user menu

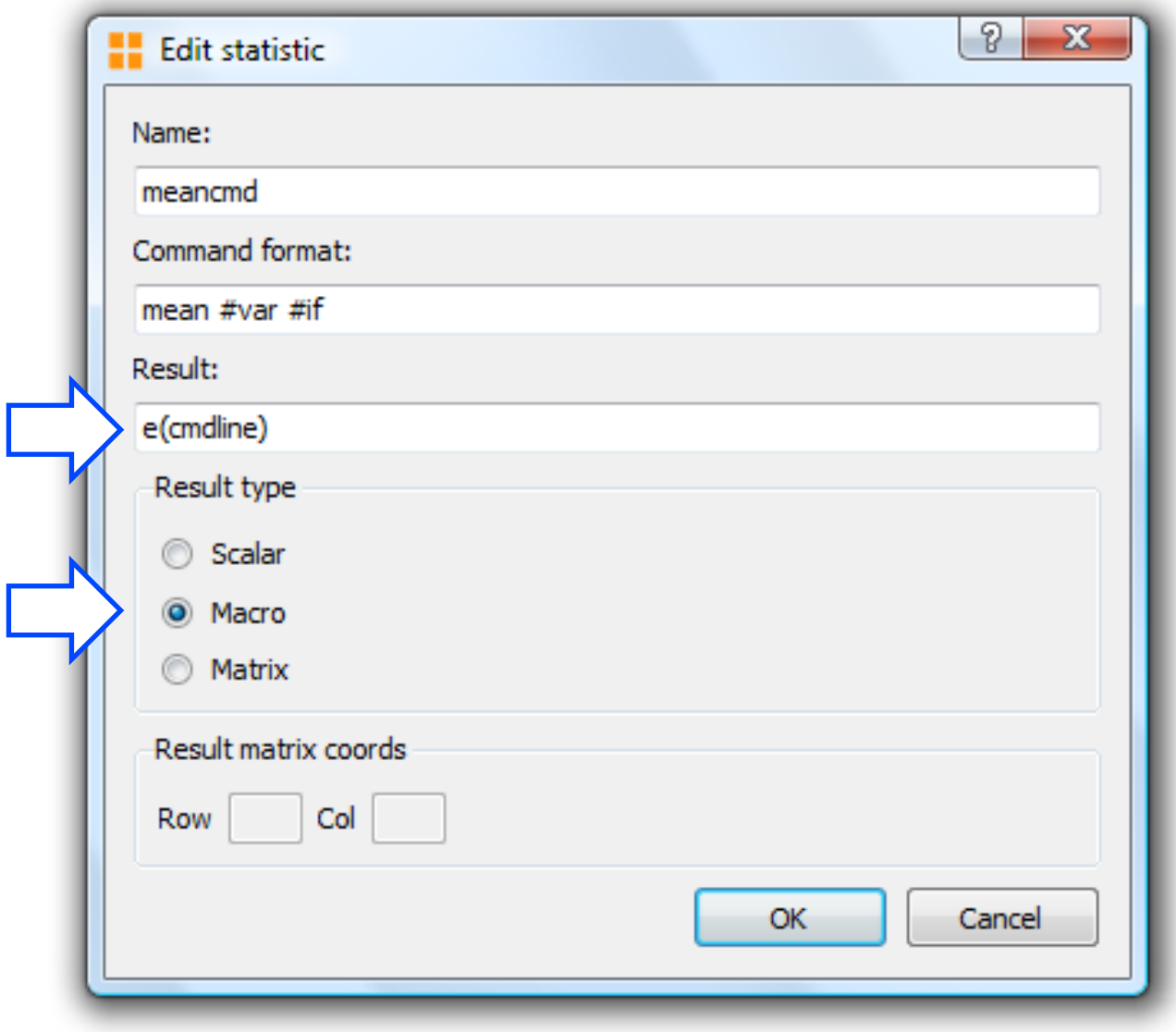


1) Create the tabula_.ado file (see tip #1).
2) Put the tabula_.ado file in a valid ado path (type `help adopath` for more informations).
3) Add this line to the profile.do file:

```
window menu append item "stUser" "Tabula" `"tabula_"'
```

Tip #3: How to debug Tabula

Step 1: create a statistic with e(cmdline) macro result



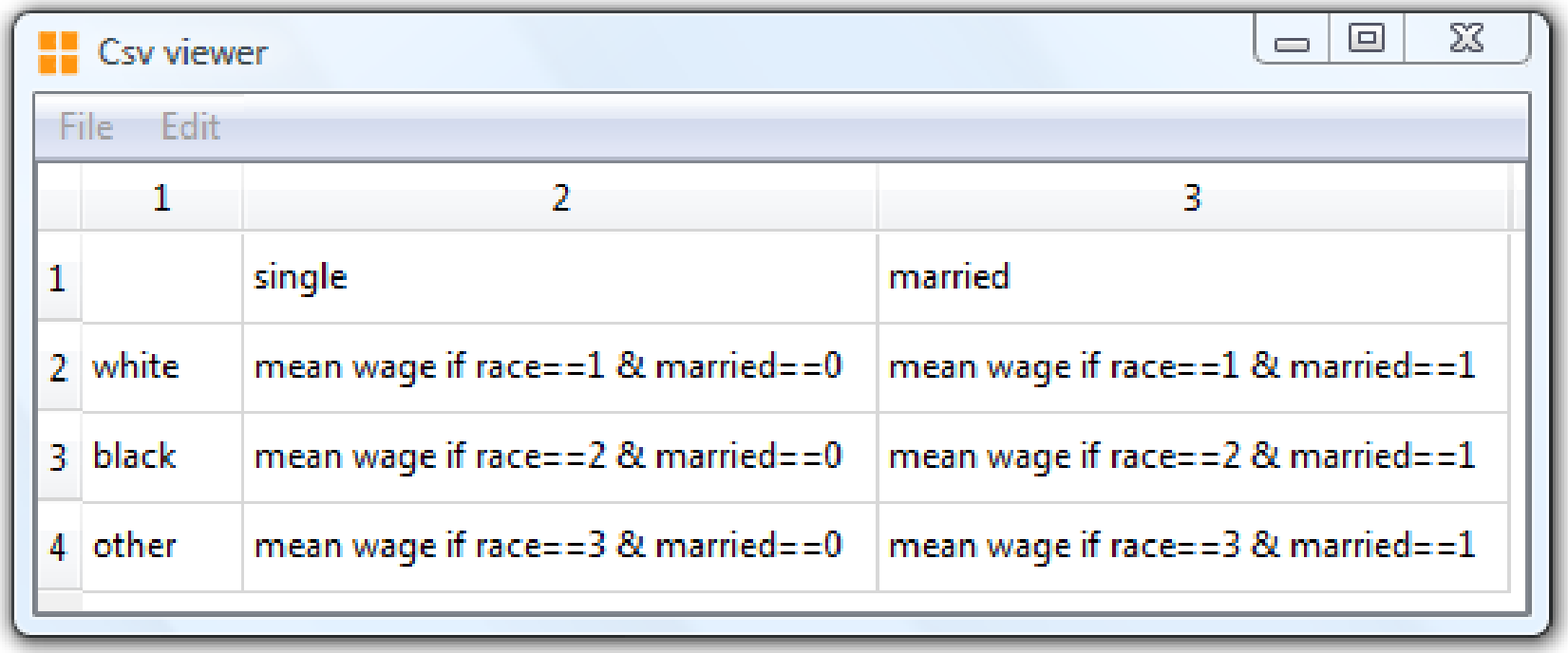
Tip #3: How to debug Tabula

Step 2: drag and drop the statistic with “macro” result type

	1	2	3
1		single	married
2	white	meancmd(wage)	meancmd(wage)
3	black	meancmd(wage)	meancmd(wage)
4	other	meancmd(wage)	meancmd(wage)

Tip #3: How to debug Tabula: the self-explaining table

The final self-explaining table



	1	2	3
1		single	married
2	white	mean wage if race==1 & married==0	mean wage if race==1 & married==1
3	black	mean wage if race==2 & married==0	mean wage if race==2 & married==1
4	other	mean wage if race==3 & married==0	mean wage if race==3 & married==1

Advantages from using Tabula

Stop reinventing the wheel

Avoid error-prone complex do files

Self-explaining data analysis

Possible improvements to Tabula

- Allowing user to assign more than one area to each cell
- Adding “undo” and “redo” functions
- Adding copy, cut and paste functions for cells
- Allowing user to save and load “statistic” commands list
- Allowing user to choose delimiter for the CSV file
- Integrating Tabula with document markup languages like Latex or Html
- Creating the on line help
- Creating versions of Tabula for other operating systems
- Fixing many bugs

A possible future: Tabula with Numerics by Stata

Numerics by Stata is a technology that allows stand-alone software to use Stata as a statistical engine
http://www.stata.com/products/numbystata.html

ADePT, a software by World Bank, uses Numerics by Stata for poverty analysis
http://www.stata.com/news/statanews.25.2.pdf

Tabula could be improved using Numerics by Stata allowing:

- Direct connection to Stata (no intermediate do file would be needed).
- Real-time computations.

What You See Is What You Tabulate