[New page: 18 January 2018]

## John MacInnes <u>An Introduction to Secondary Data Analysis with IBM SPSS Statistics</u> (Sage, Dec. 2017)

# 4.1.7: Guide to video tutorials 10 and 11 for Chapter 4: Getting Started with SPSS

## Previous guides:

Aide-mémoire for easier navigation of companion website

4.1.1 Overview of video tutorials 1 to 6

4.1.2 Downloading the European Social Survey Practice File

4.1.3 Downloading the SPSS syntax

4.1.4 Checking the SPSS files

4.1.5 Guide to video tutorials 7 and 8

4.1.6 Guide to video tutorial 9

### Page Video

## Paragraph in book

2 <u>Video 10: Mbw excel chart</u> (9'19")
4.20: Exporting output to other applications
4 4.21: Examining Gender and Employment
9 <u>Video 11: Auto recode</u> (8'17")
4.22: Creating Numeric Versions of String Variables

The following notes assume you are familiar with copy/paste ( Ctrl+C / Ctrl+V) highlighting and dragging with left mouse down, and that you have access to a licenced copy of SPSS. They are based on communications with John MacInnes and Sage when I first accessed the companion website and are offered, not as criticism, but as supplementary comments intended to help guide users through Chapter 4. The direct link to the video tutorials for Chapter 4 is: <u>Chapter 4 video tutorials</u>

# Warning!

All the video tutorials for Chapter 4 are on the same webpage and can be accidentally triggered by stray mouse pointers. If you are not careful you can have two or more simultaneous commentaries playing and can't always tell which commentary relates to which video. It would be far better to split all these videos across separate pages.

Chapter 4: Getting Started with 🛛 🗡 SPSS	Datasets	Clicking on <u>Datasets</u> downloads SPSS saved file ESS6_Practice.sav. Clicking on <u>Syntax</u>
Video tutorials	Syntax	downloads file <b>Syntax_Ch_4.sav</b> which is <b>not</b> an <b>SPSS</b> *.sav file, but a <b>Notepad</b> *.txt file containing
Syntax files and Datasets		all the syntax commands for all the analyses (See: <u>4.1.3 Downloading the SPSS syntax</u> )

The syntax text really needs to be split into separate **\*.sps** files for each topic, preferably with file names corresponding to the relevant paragraph in the text.

### Video 10: Mbw excel chart (9'18")

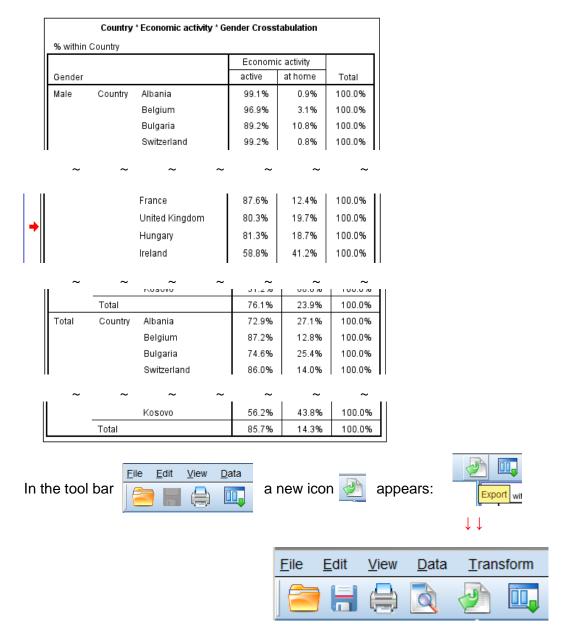
### Chapter 4, paragraph 20: Exporting output to other applications (p 96)

JM refers to the modified three-way table he created in 4.1.6 from which he proposes to produce the barchart in the book (Fig 4.24: p 98). Deletes missing values of **[mbw]** and reruns the syntax:

CROSSTABS /TABLES=cntry BY mbw BY gndr /FORMAT=AVALUE TABLES /CELLS= ROW /COUNT ROUND CELL.

Of the table he says, "As it stands that table isn't very easy to understand. Let's turn to the more interesting part . . . economic activity of women in different countries. Let's do that by exporting the table to Excel and then producing a barchart."

In the SPSS viewer he clicks on the table and a small red arrow appears halfway down on the left side:



JM clicks on $\boxed{2}$ to get Export Output dialog	
Objects to Export         Image: Comparison of the system         Image: Comparison of the system	$\rightarrow \rightarrow \text{Checks Selected} \bigcirc \underline{\text{All } \bigcirc \text{All } \underline{v} \text{isible } }$
	A rich text document containing both text     and graphics will be created. The     graphics will be embedded in the     document. No graphics options are     available.     Wide Pivot Tables Wrap table to fit within page     Preserve break points and Yes     Views of Models     Honor print setting (set in M     Page measurement units     Millimeters     Page width     209.9699999999997     Page height     206.06000000000007
	Change Options         Elie Name: C:\Users\John Hall\Desktop\Research 2017\MacInnes 2017\M SPSS files\OUTPUT.doc         Graphics         Type:       Options:         JPEG file (* jpg)       No options available
	Change Options Root File Name SersUohn Hali/Desktop/Research 2017/MacInnes 2017/JM SPSS files/OUTPUT.jpeg Browse  OK Paste Reset Cancel Help

In JM's version of SPSS the default destination is Excel, but in mine it is Word

	<u>T</u> ype:			
I click on the <b>V</b> in	Word/RTF (*.doc)	T	to get Document Type	e
			$\downarrow \downarrow$	
	Г	Document		
		<u>T</u> ype:		
		Word/RTF (*.doc)		-
		Excel 97-2004 (*.xls)		-
		Excel 2007 and Higher (	*.xlsx)	
		Excel 2007 and Higher M	Macro-enabled (*.xlsm)	
		HTML (*.htm)		
		Web Report (*.htm or *.r	mht)	
		Portable Document For	mat (*.pdf)	
		PowerPoint (*.ppt)		
		Text - Plain (*.txt)		M
Click on	Excel 2007 a	nd Higher (*.xlsx) th	nen on Change Opt	tions
		to	get Export Output: E	xcel Options

Export Output: Excel Options opening dialog:

📲 Export Output: Excel Options	×					
What Do You Want to Do? <ul> <li>Create a workbook</li> <li>If you specify the name of an existing workbook, it will be completely overwritten.</li> <li>Create a worksheet</li> <li>If you specify the name of an existing worksheet, it will be completely overwritten.</li> <li>Modify an existing worksheet</li> </ul> <li>Worksheet name:         <ul> <li>Location in Worksheet</li> <li>After last column</li> <li>After last row</li> <li>Starting at at the specific cell             <ul> <li>Existing data at the specified location will be overwritten.</li> </ul> </li> </ul></li>	Layers in Pivot Tables					
Continue Reset	Cancel Help					
JM types <b>mbw</b> in W	orksheet name: mbw	then clicks	Continue	to get:		
☑ Open the	containing folder	and clicks	ОК			
A new Excel file 👔	OUTPUT appears in	his <b>containing</b>	(destinati	ion) folder:		
C 5554	Pra., 17/05/2017 17:18	SPSS Statistics D	at			
→ 1 Ф олт	PUT 10/01/2018 10:05	Microsoft Excel V	Va			
S	Type: Microsoft Excel Works Authors: IBM SPSS Export Fi Size: 11.5 KB Date modified: 10/01/2018 1	acity				
When I tried it I got:						
TIBM SPSS Statistics 24	in the folder you specified.	×				
Browse to folder: 💳	Save File bok in: 🚺 My ESS files					
File name: n Hall\Des	ktop\Research 2018\MacInr	nes 2017\My ESS fil	les\mbw	Save		
Save as type: Excel 200	7 and Higher (*.xlsx)		-	Cancel		
Click on Save	then on OK to	o save Excel fil	e mbw.xls	sl to folder <mark>N</mark>	/ly ESS	iles files
					ESS6_	Practice
				×1	mbw	
					mbw2	

## Chapter 4, paragraph 21: Examining Gender and Employment (p 99)

JM opens the Excel file: (video point 4'45")

	А	В	С	D	E	F
1		Country	/ * Economic activity * G	ender Crosst	tabulation	
2	% within					
3				Economi	c activity	
4	Gender			active	at home	Total
5	Male	Country	Albania	99.1%	0.9%	100.0%
6	1		Belgium	96.9%	3.1%	100.0%
7	1		Bulgaria	89.2%	10.8%	100.0%
8	1		Switzerland	99.2%	0.8%	100.0%
~	~	~	~~~~	~	~	~ ~
90	1		Slovenia	87.7%	12.3%	100.0%
91	1		Slovakia	89.1%	10.9%	100.0%
92	1		Ukraine	78.1%	21.9%	100.0%
93	1		Kosovo	56.2%	43.8%	100.0%
94	1	Total		85.7%	14.3%	100.0%

"Now, I want to produce a barchart . . . , but before I do that I'm going to re-order the rows to make the interpretation easier."

Highlights rows for women in the second section

35	Female	Country	Albania	50.7%	49.3%	100.0%
36			Belgium	77.8%	22.2%	100.0%
37			Bulgaria	64.7%	35.3%	100.0%
38			Switzerland	73.3%	26.7%	100.0%
39			Cyprus	68.6%	31.4%	100.0%
40			Czech Republic	86.7%	13.3%	100.0%
41			Germany	73.4%	26.6%	100.0%
42			Denmark	79.3%	20.7%	100.0%
43			Estonia	88.5%	11.5%	100.0%
44			Spain	70.1%	29.9%	100.0%
45			Finland	30.5%	3.5%	100.0%
46			France	87.6%	12.4%	100.0%
47			United Kingdom	80.3%	13.7%	100.0%
48			Hungary	81.3%	18.7%	100.0%
49			Ireland	58.8%	41.2%	100.0%
50			Israel	75.5%	24.5%	100.0%
51			Iceland	74.2%	25.8%	100.0%
52			Italy	77.3%	22.7%	100.0%
53			Lithuania	85.6%	14.4%	100.0%
54			Netherlands	71.8%	28.2%	100.0%
55			Norway	88.4%	11.6%	100.0%
56			Poland	79.4%	20.6%	100.0%
57			Portugal	74.3%	25.7%	100.0%
58			Russian Federation	87.7%	12.3%	100.0%
59			Sweden	94.9%	5.1%	100.0%
60			Slovenia	80.3%	19.7%	100.0%
61			Slovakia	83.9%	16.1%	100.0%
62			Ukraine	68.5%	31.5%	100.0%
63			Kosovo	31.2%	68.8%	100.0%

"What has it done?" he asks.

His first attempt has sorted column C (country) by alphabetical order, because it was the (default) first column encountered.

He goes back to the table, and sorts on column D ("active") <sup>1</sup>

ort				<u>?</u> ×
★ Add Level X Delete Level	Copy Level	Options	🗌 Му	data has <u>h</u> eaders
Column	Sort On		Order	
Sort by Column D	Cell Values	•	Smallest to Largest	•
			ОК	Cancel
			L	

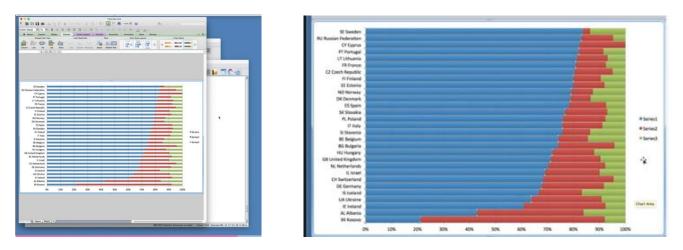
. . to produce the following table in which countries are sorted in **ascending order** of the percentage of women who are economically active:

	$\downarrow\downarrow$	
Albania	31.2%	49.3%
Belgium	50.7%	22.2%
Bulgaria	58.8%	35.3%
Switzerland	64.7%	26.7%
Cyprus	68.5%	31.4%
Czech Republic	68.6%	13.3%
Germany	70.1%	26.6%
Denmark	71.8%	20.7%
Estonia	73.3%	11.5%
Spain	73.4%	29.9%
Finland	74.2%	9.5%
France	74.3%	12.4%
United Kingdom	75.5%	19.7%
Hungary	77.3%	18.7%
Ireland	77.8%	41.2%
Israel	79.3%	24.5%
Iceland	79.4%	25.8%
Italy	80.3%	22.7%
Lithuania	80.3%	14.4%
Netherlands	81.3%	28.2%
Norway	83.9%	11.6%
Poland	85.6%	20.6%
Portugal	86.7%	25.7%
Russian Federation	87.6%	12.3%
Sweden	87.7%	5.1%
Slovenia	88.4%	19.7%
Slovakia	88.5%	16.1%
Ukraine	90.5%	31.5%
Kosovo	94.9%	68.8%

<sup>&</sup>lt;sup>1</sup> To sort the columns in my version of Excel I had to right click inside the highlighted area and select Sort >> Custom Sort to get the Sort dialog.

JM now proceeds to create a barchart (6'03")

Goes to Charts and gets a clustered barchart (6'45") but now has three categories rather than two.



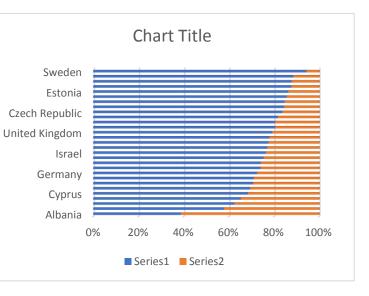
He narrows the gap between the bars and adds labels to each category: blue is active, red is at home, green is Other, but would the curve be smoother if "Other" were omitted?

Create ratio [% active : % at home] for Albania =J35/K35 and copy to all countries to get:

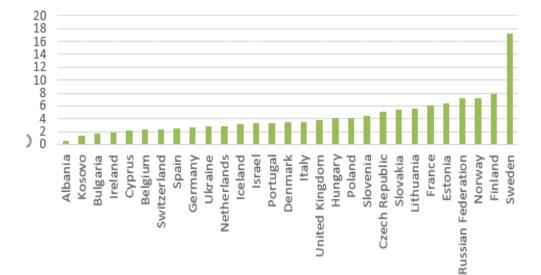
 $\downarrow\downarrow$ 

			$\downarrow \downarrow$
Albania	31.2%	49.3%	0.6
Kosovo	94.9%	68.8%	1.4
Bulgaria	58.8%	35.3%	1.7
Ireland	77.8%	41.2%	1.9
Cyprus	68.5%	31.4%	2.2
Belgium	50.7%	22.2%	2.3
Switzerland	64.7%	26.7%	2.4
Spain	73.4%	29.9%	2.5
Germany	70.1%	26.6%	2.6
Ukraine	90.5%	31.5%	2.9
Netherlands	81.3%	28.2%	2.9
lceland	79.4%	25.8%	3.1
Israel	79.3%	24.5%	3.2
Portugal	86.7%	25.7%	3.4
Denmark	71.8%	20.7%	3.5
Italy	80.3%	22.7%	3.5
United	75.5%	19.7%	3.8
Hungary	77.3%	18.7%	4.1
Poland	85.6%	20.6%	4.1
Slovenia	88.4%	19.7%	4.5
Czech	68.6%	13.3%	5.1
Slovakia	88.5%	16.1%	5.5
Lithuania	80.3%	14.4%	5.6
France	74.3%	12.4%	6.0
Estonia	73.3%	11.5%	6.4
Russian	87.6%	12.3%	7.1
Norway	83.9%	11.6%	7.2
Finland	74.2%	9.5%	7.8
Sweden	87.7%	5.1%	17.2

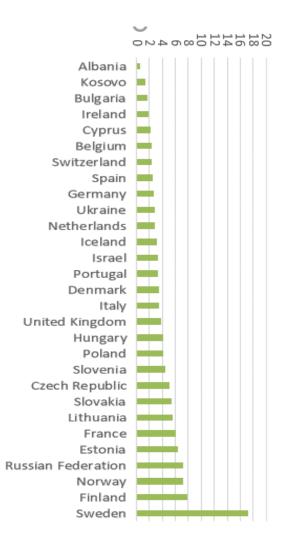
Not sure how I produced the chart below, but some countries got omitted. Nice chart though!



The above chart is missing some countries, but the one below includes all countries:



It's easier to read if you rotate it:



### Video 11: Auto recode (8'17")

### Chapter 4, paragraph 22: Creating Numeric versions of String Variables (p 100)

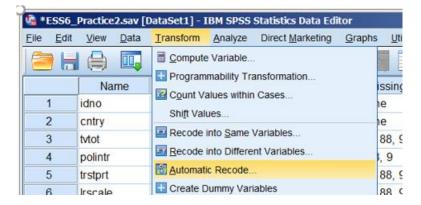
Computers are far better at handling numeric than alphabetic (string) data. Although they can handle strings, the procedures can take longer (and be more expensive). For many statistical analyses, string variables can be converted to numeric using:

RECODE <"string value"> into <numeric value> .

The SPSS procedure AUTORECODE automatically recodes strings to numeric.

2 cntry Country {AL, Albania} None String dordinal
--

#### Transform >> Automatic Recode



... to get the Automatic Recode dialog.

### Clicks on cntry then on

🚔 Automatic Recode	×	🖨 Automatic Recode
Automatic Recode	Variable-> New Name	Variable-> New Name
	New Name: Add New Name Recode Starting from Lowest value O Highest value cheme for all variables	<ul> <li>kidno</li> <li>tvtot</li> <li>polintr</li> <li>trscale</li> <li>freehms</li> <li>rigblg</li> <li>rigblg</li> <li>kinghing</li> <li>kinghing</li> <li>kew Name:</li> <li>Add New Name</li> <li>Add New Name</li> <li>Recode Starting from</li> <li>Lowest value ○ Highest value</li> <li>Use the same recoding scheme for all variables</li> <li>Treat blank string values as user-missing</li> <li>Template</li> <li>Apply template from:</li> <li>Save template as:</li> <li>File</li> <li>OK Paste Reset Cancel Help</li> </ul>
Writes <b>country</b> in	New Name box, <u>New Na</u>	me: country
Clicks Add New	Hume to get	e-> New Name

### to move it to the Variables > New name box

Clicks on **Paste** to produce the following syntax:

DATASET ACTIVATE DataSet1. AUTORECODE VARIABLES=cntry /INTO country /PRINT.

### (2'21") Runs the syntax to get:

Old	Value	New	Value	Value Label
AL			1	Albania
BE			2	Belgium
BG			3	Bulgaria
CH			4	Switzerland
СҮ			5	Cyprus
CZ			6	Czech Republic
DE			7	Germany
DK			8	Denmark
ΕE			9	Estonia
ES			10	Spain
FΙ			11	Finland
FR			12	France
GB			13	United Kingdom
HU			14	Hungary
ΙE			15	Ireland
ΙL			16	Israel
IS			17	Iceland
IΤ			18	Italy
LT			19	
NL			20	Netherlands
NO			21	Norway
PL			22	Poland
ΡT			23	Portugal
RU			24	Russian Federation
SE			25	Sweden
SI			26	Slovenia
SK			27	Slovakia
UA			28	Ukraine
XK			29	Kosovo

The variable [country] is appended to the Data Editor

24	country	Country	{1, Albania}	None	Numeric	📲 Ordinal

[NB: In the Level column SPSS has assigned [country] to Ordinal: it needs changing to Nominal]

If you click on the cells (one at a time) in the Values column for

[cntry	/]			and <mark>[co</mark> ı	untry]			
File Edil Viev Dat: Trans		M SPSS Statistics Grapi Utilitic Extensit Wit					M SPSS Statistics Grapi <u>U</u> tilitic E <u>x</u> tensio	Windc <u>H</u> elr
Name           1         idno           2         cntry           3         tvtot	Responden Country	Values None	M Nor Nor 77, -	24	Name country	Label Country	Values {1, Albania}	M Nor
Data View Variable V IBM SPSS Statist	ics Processor is read				Variable View	Processor is read	ty Unicode:ON	

you can see that the string values for [cntry] have been replaced with numeric values for [country]

🚔 Value Labels	×
Value Labels	
Val <u>u</u> e:	Spelling
Label:	
AL = "Albania" BE = "Belgium" BG = "Bulgaria" CH = "Switzerland"	
CY = "Cyprus"	
OK Cancel Help	

Value		
Value L	abels	0
-		Spelling
Label:		
<u>C</u> h	1 = "Albania" 2 = "Belgium" 3 = "Bulgaria" 4 = "Switzeriand" ************************************	
Inci	5 = "Cyprus"	
	OK Cancel Help	

[NB: You can drag the bottom edges of the dialog boxes down to see the whole list]

Val <u>u</u> e:		Spelling
Label:		
Add Change Remove	AL = "Albania" BE = "Belgium" BG = "Bulgaria" CH = "Switzerland" CY = "Cyprus" CZ = "Czech Republic" DE = "Germany" DK = "Denmark" EE = "Estonia" ES = "Spain" FI = "Finland" FR = "France" GB = "United Kingdom" HU = "Hungary" IE = "Ireland" IL = "Israel" IS = "iceland" II = "Italy" LT = "Lithuania" NU = "Norway" PL = "Poland" PT = "Portugal" RU = "Russian Federation" SE = "Sweden"	
	SI = "Slovenia" SK = "Slovakia" UA = "Ukraine" XK = "Kosovo"	

Value Labels		
Val <u>u</u> e:		Spelling
Label:		
	1 = "Albania" 2 = "Belgium" 3 = "Bulgaria"	
	4 = "Switzerland" 5 = "Cyprus" 6 = "Czech Republic"	
	7 = "Germany" 8 = "Denmark" 9 = "Estonia"	
	10 = "Spain" 11 = "Finland" 12 = "France"	
Add	13 = "United Kingdom" 14 = "Hungary"	
Change Remove	15 = "Ireland" 16 = "Israel" 17 = "Iceland"	
	18 = "Italy" 19 = "Lithuania" 20 = "Netherlands"	
	21 = "Norway" 22 = "Poland"	
	23 = "Portugal" 24 = "Russian Federation" 25 = "Sweden"	
	26 = "Slovenia" 27 = "Slovakia" 28 = "Ukraine"	
	29 = "Kosovo"	

Jm now says, "Let's practice our syntax skills a little." and uses direct syntax to create a new variable [country1] with one group containing France, Germany, UK, Netherlands, Portugal, Russian Federation and Sweden and another group containing all other countries.

compute country1 = country .
recode country1 (12 7 13 20 23 24 25 = 1)(ELSE = 0) .
. . and runs a check:
cross country1 by country .

[NB: Note that JM over-rides the SPSS prompt which would display the **RECODE** command in UPPER CASE, but that he leaves the display for ELSE. He also uses abbreviated syntax **cross** in lower case which is not colour-coded by SPSS.]

The syntax produces a very wide table so he swaps the rows and columns.

								Court	rtry																						
		Abania	Belgium	Bulgaria	Switzerland	Cyprus	Czech Republic	Germany	Denmark	Estonia	Spain	Finland	France	United Hingdom	Hungary	ireland	Israel	Iceland	Italy	Lithuania	Netherlands	Norway	Poland	Portugal	Russian Federation	Sweden	Slovenia	Slovakia	Ukraine	Kosovo	Total
country1 other	и	1201	1869	2260	1493	1116	2009	0	1650	2380	1889	2197	0	0	2014	2628	2508	752	950	2109	0	1624	1898	0	0	0	1257	1847	2178	1295	39134
selec	ected countries	0	0	0	0	0	0	2958	0	0	0	0	1968	2286	0	0	0	0	0	0	1845	0	0	2151	2484	1847	0	0	0	0	15539
Total		1201	1869	2260	1493	1116	2009	2958	1650	2380	1889	2197	1968	2286	2014	2628	2508	752	960	2109	1845	1624	1898	2161	2484	1847	1257	1847	2178	1295	54673

cross country by country1.

		count	try1	
		0.00	1.00	Total
Country	Albania	1201	0	120 <sup>-</sup>
	Belgium	1869	0	1869
	Bulgaria	2260	0	2260
	Switzerland	1493	0	149
	Cyprus	1116	0	111
	Czech Republic	2009	0	200
	Germany	0	2958	295
	Denmark	1650	0	165
	Estonia	2380	0	238
	Spain	1889	0	188
	Finland	2197	0	219
	France	0	1968	196
	United Kingdom	0	2286	228
	Hungary	2014	0	201
	Ireland	2628	0	262
	Israel	2508	0	250
	Iceland	752	0	75
	Italy	960	0	96
	Lithuania	2109	0	210
	Netherlands	0	1845	184
	Norway	1624	0	162
	Poland	1898	0	189
	Portugal	0	2151	215
	Russian Federation	0	2484	248
	Sweden	0	1847	184
	Slovenia	1257	0	125
	Slovakia	1847	0	184
	Ukraine	2178	0	217
	Kosovo	1295	0	129
Total		39134	15539	5467

Country \* country1 Crosstabulation

It's worked: gives it some labels. (6'23")

val labels country1 1 'selected countries' 0 'other' .

[NB: He's still using abbreviated syntax and lower case, even in the labels in which the first letter would normally be capitalised (e.g. 'Selected countries' 'Other'). There is no variable label for [country1]. This is clearly a working file used for exploring the data, but standard practice would normally be to specify metadata (labels, missing values, measurement levels, formats etc. before running the analysis.]

## [MacInnes 4.1.7: Guide to video tutorials 10 and 11 for Chapter 4]

×

Spelling.

1 *ES	6_Practice2.sav []	DataSet1] - IBM SPS	S Statistics Data Edito	r		_ 🗆 ×	1	🚔 Value Labels
	dit <u>V</u> iew <u>D</u> ata	Transform Analyz	e Direct <u>M</u> arketing <u>(</u>	<u>è</u> raphs <u>U</u> tilit	-	Window Help		Value Labels
24 25	Name           country           country 1	Label Country	Values {1, Albania} {0, other}	Missing None None	Type Numeric Numeric	Measure		Add 0 = "other" Change
Data V	ew Variable View		IBM SPSS Statistic	s Processor is	ready	ode:ON	-	Remove OK Cancel Help

He still has his enormous Syntax Editor open. He selects cases by going to the Select Cases icon and extending the logical expression from the filter he generated in Video 9 for:

	Task 1: Select only tho	8: Subsetting and Selecting Cases (p 93) ose cases aged between 25 and 54 <sup>2</sup> to video tutorial 9, page 4)
•	agea ge 25 and agea le 54	Adds: " and country1 = 1 "
ta s	elect Cases: If	
	idno 🗾 🦳	agea ge 25 and agea le 54 and country1 = 1

In the video his table has no variable or value labels for [country1] just values 0.00 and 1.00.

Country \* country1 Crosstabulation

Count	-	-		
		cour	ntry1	
		0.00	1.00	Total
Country	Albania	1201	0	1201
	Belgium	1869	0	1869
	Bulgaria	2260	0	2260

<sup>&</sup>lt;sup>2</sup> On page 93 JM talks about selecting men and women between the ages of 25 and 49, but in the video selects people aged between 25 and 54.

However, because I saved the file modifications in new files **ESS6\_Practice2.sav** and **ESS6\_Practice3.sav** with **[filter\_\$]** (and also entered the value labels) I can simply write:

filter by filter\_\$ . cro country by country1 .

.. to get:

Country \* country1 Crosstabulation

		C	country1	
		other	selected countries	Total
Country	Albania	566	0	56
	Belgium	912	0	91
	Bulgaria	965	0	96
	Switzerland	728	0	72
	Cyprus	573	0	57
	Czech Republic	1004	0	100
	Germany	0	1395	139
	Denmark	710	0	7′
	Estonia	1059	0	105
	Spain	1039	0	103
	Finland	991	0	99
	France	0	915	9
	United Kingdom	0	1015	10
	Hungary	1005	0	10
	Ireland	1380	0	13
	Israel	1187	0	118
	Iceland	363	0	3
	Italy	476	0	4
	Lithuania	960	0	9
	Netherlands	0	891	8
	Norway	812	0	8
	Poland	924	0	93
	Portugal	0	928	9:
	Russian Federation	0	1280	128
	Sweden	0	848	8
	Slovenia	591	0	59
	Slovakia	950	0	9
	Ukraine	1019	0	10
	Kosovo	716	0	7
Fotal		18930	7272	2620

Having selected a subset of people aged between 25 and 54, JM will proceed to examine working hours in the next tutorial.

**End of:** 4.1.7: Guide to video tutorials 10 and 11 for Chapter 4

Forward to: <u>4.1.8 Guide to video tutorial 12 for Chapter 4</u>

Back to:4.1.6 Guide to video tutorial 9Back to:MacInnes (2017)