IRTPRO[™]

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1. Data import and manipulation

There are many ways to import data into IRTPRO for analysis. In this chapter, we briefly describe procedures for data-import from three commonly used formats: the **.sav** file format used by SPSS, fixed-format ASCII data, and comma-delimited text files.

In all cases, data are "imported" into IRTPRO (fixed-format input uses the **Open** command, but the effect is the same), and then re-saved as an IRTPRO system data (.ssig) file that is subsequently opened for analysis.

1.1 Importing Data from SPSS .sav Files

SPSS .sav files represent one example of many proprietary formats from which IRTPRO can import data.

To begin the data-import process, one starts IRTPRO and selects Import... under the File menu:



This brings up a standard **Open File** dialog; in the lower center is a pop-up menu from which the user may select one of a large number of formats.

IR	R	PRO	•	
Flexible Protession	al Item Response Theo	ASCII File - Delimited(*.txt;*.csv)		
🔀 Open		dBASE(*.dbf) Excel(*.xls) Epi Info(*.rec)		X
Look in:	📜 Asthma34	Gauss(*.dat) Gauss - Unix(*.dat) HTML Table(*.htm*)		
Pro	Name	Informix(*.ifx)		dified
Recent Places Desktop Libraries	Asthma_34.sav	JMP(*;imp) LIMDEP for Windows(*.lpj) Lotus 1-2-3(*.wk*;*.wr*) Matlab Matrix(*.mat) Mineset(*.schema;*.sch) Minitab(*.mtw) OSIRIS(*.dct*.dict) Paradox(*.db) Quattro Pro(*.wq?;*.wb?) S-Plus(*.ssc) SAS Data File - Versions 7/8/9(*.sd7;*.sas7bdat) SAS V6 Data File - HP.IBM,SGI & SUN Unix(*.ssd01) SAS V6 Data File - Purions 7/8/9(*.sd7;*.sas7bdat) SAS(Sun) Data File - Versions 7/8/9(*.sd7;*.sas7bdat) SAS(Alpha) Data File - Versions 7/8/9(*.sd7;*.sas7bdat) SAS(Alpha) Data File - Versions 7/8/9(*.sd7;*.sas7bdat)	III	11 11:21 AM
	•	SAS transport lie(.xpr, .tpt) SAS Program & Data File(* sas)		•
Network	File name:	SPSS Data File(".sav) SPSS Data File(".sav) SPSS Data File - HP,IBM, & Sun Unix(*.sav) SPSS Portable File(*.por)	Ŧ	Open
	Files of type:	SPSS Data File(*.sav)		Cancel
		Open as read-only		

Here we select **SPSS Data File (*.sav)**; then, after navigating to the folder that contains the **.sav** file from which we wish to import data, we **Open** the file:

🔀 Open					×
Look <u>i</u> n:	👢 Asthma34	•	G 🦻 🖻	۶ 🛄 🔻	
Recent Places Desktop Libraries	Name	,		Date modified	ed 1:21 AM
Computer Computer Network	 ✓ File <u>n</u>ame: Files of type: 	III Asthma_34.sav SPSS Data File(*.sav)		•	▶ <u>O</u> pen Cancel
		Open as read-only			

The next thing that happens is a standard **Save As** dialog appears, which has as its default to save the data as a .ssig file with the same name as the .sav file (in the case of this example, **Asthma_34**).

The user may (optionally) change the first part of the name; however, the extension should remain **.ssig**. Click the **Open** button to start the data import process.

🔀 Save As		
Save <u>i</u> n:	📜 Asthma34 🗸 💿 🗯	; 📂▼
Recent Places Desktop Libraries Computer	Name Asthma34.ssig	Date modified 2/11/2011 9:55 AM
Network	III File name: Asthma_34.ssig Save as type: System Data File (*.ssig)	▼ <u>S</u> ave ▼ Cancel

After one clicks **Save** the file is saved as an **.ssig** file, and the user has the opportunity to **Open** it to begin the analysis:

Finish Import	X
Done importing.	Do you want to open Asthma_34.ssig
	Yes No

If one clicks **Yes**, the file opens.

A very important first thing to do the first time a new .**ssig** file is opened, is to enter missing the code that represents missing data in the dataset. This code must be numeric; there can only be a single missing data code, common to all of the items; and the missing data code cannot also be a valid item response code for any item. For data coded 0, 1, 2, 3, ..., it is common to use -9 as the missing value code. Note that the default missing value code in IRTPRO is -1.

To set the missing value code, select the **Missing Value Code**... entry under the **Data** menu:

K IRTPRO - [Asthma_34.ssig]									
File Edit Data Manipulate Graphics Anal					ics Analys	sis	View Wi	ndow Help)
🗅 🗃 🖬 🛛 🐰 Insert Variables									
	DISAB	[Delete Var	iables			DISAB_5	DISAB_6	DISAB_7
1	2	I	nsert Case	S.			1	1	2
2	2	;					2	2	4
3	2	L	Jelete Cas	es			2	1	2
4	0	١	/ariable Pi	roperties			0	1	0
5	3	N	Aissing Va	lue Code			2	4	2
6	3		1	1	0	-9			
7	4	F	Recalculate	e Item Coun	its		4	2	4
8	0	0		0	1		2	1	2
9	2	2		2	3		4	3	3
10	3	3		1	2		2	2	2
11	0	0		0	2		0	1	0

That brings up a **Missing Value Code** dialog into which the user may enter the code, and click on **OK**.

Missing Value Coc	ie	X
Missing value	-9	ОК
		Cancel

After that is done, it is important to Save the .ssig file:

IRTPRO - [Asthma_34.ssig]							
Tile 💷	e Edit Data	Manipulate	Graphics	Analysis			
D	New		C	trl+N			
	Open		C	trl+O			
	Close						
	Save		(Ctrl+S			
	Save As						

Once the missing value code has been set, and the **.ssig** file has been saved, the missing data code will be stored within the **.ssig** file and IRTPRO will "remember" the code in subsequent uses of the data.

The file is now ready, and the user may proceed with analyses as described in Chapters 4 to 5.

1.2 Opening Fixed-Format Data Files

To bring in data from a fixed-format file, there is a slightly different procedure. It begins with the **Open** option under the **File** menu:

File	Edit	Data	Manipulate	Graphics	Analysis
	New			C	Ctrl+N
	Open.		C	Ctrl+O	
	Close				
	Save			(Ctrl+S
	Save A	As			
	Print			(Ctrl+P
	Print P	review			
	Print S	Setup			
	1 Asth	ma_34.	ssig		
	2 Asth	ma34.s	sig		
	3 AAC	L3_21It	ems.ssig		
	4 PISA	00Read	dMathBook8.s	sig	
	5 PISA	MathB	ook1USUK4.ir	tpro	
	Exit				

which brings up a standard **Open** dialog. In the lower center of this dialog, the user selects **Fixed Format Data (*.fixed)** from the pop-up menu, identifying **Files of type**:

🔀 Open	_		_	×
Look <u>i</u> n:	👢 Simulated	•	G 🤌 🖻	۶ 🛄 🕶
Recent Places Desktop Libraries	Name isimul5.fixed	*		Date modified 7/20/2011 8:04 PM
Computer Computer Network	 ✓ File name: Files of type: 	III simul5.fixed Fixed Format Data (*.fixed) Open as read-only		✓ <u>Open</u> Cancel

Then one opens the file; here we use as an example the file **simul5.fixed stored in the folder IRTPRO Examples\By Dataset\Simulated.** The data consists of five multiple category items. The simulated data represents 1000 examinees drawn at random from a population with mean ability score of 0.0 and standard deviation of 1.0.

Note that it is necessary that the fixed-format data file has the extension .fixed.

🔀 Open				×
Look <u>i</u> n:	👢 Simulated	•	G 🦻 🖻	୭▼
Recent Places Desktop Libraries	Name im simul5.fixed	*		Date modified 7/20/2011 8:04 PM
Network	 ✓ File name: Files of type: 	III simul5.fixed Fixed Format Data (*.fixed)		▼ <u>Open</u> ▼ Cancel

After the user clicks **Open**, an image of the file appears on the screen:

🔀 IRTPRO - [simul5.fixed]							
■ <u>F</u> ile <u>V</u> iew <u>H</u> elp						×	
🗅 🚅 日	X 🖻 f	1 4 ?					
	12345	1 678901				Ξ	
1	0001	42444					
2	0002	12221					
3	0003	32212					
4	0004	13222					
5	0005	21211					
6	0006	34443					
7	0007	23343					
8	8000	44444					
9	0009	44444					
10	0010	11111					
11	0011	43344					
12	0012	11111					
13	0013	11121					
14	0014	13243					
15	0015	33222				Ŧ	
					Þ		

In the file **simul5.fixed** there is a **Case Number** variable in columns 1 to 4 (its values are 0001 to 1000), and item responses for five items, each of which is in a one-column field, in columns 7 to 11. To bring those data into IRTPRO as an **.ssig** file, the user must indicate the division of the file into (sets of) columns, or **Fields**, and assign names to the variables.

To indicate that columns 1 to 6 should be separated from columns 7 to 11, the user doubleclicks between the small **6** and **7** in the gray column-header; after that is done; a vertical line appears between columns 1 to 6 and the subsequent columns:

IRTPRC	- [simul5.fix	ed]			
Eile	<u>V</u> iew <u>H</u> elp			- 8	×
🗋 🗅 🚅 日	1 k 🖻 🖪	a 🔋			
	123456	1 78901	L		
1	0001	42444			
2	0002	12221	L		
3	0003	32212	2		
4	0004	13222	2		
5	0005	21211	L		
6	0006	34443	3		
7	0007	23343	3		
8	8000	44444	l		
9	0009	44444	l		
10	0010	11111	L		
11	0011	43344	l		
12	0012	11111	L		
13	0013	11121	-		
14	0014	13243	3		
15	0015	33222	2		-
•				•	
					.4

After that is accomplished, there is a small rectangular box above the column-header numbers **1** to **6**. A right-click within that box brings up a menu within which the user selects the entry **Field Property** ... to give a name to this **Field**:

IRTPRO	- [simul5.f	ixed]			X	
File \	/iew Hel	p		-	8	×
	X 🖻 🖻					_
Fie	eld Propert	y				Ξ
- Re	move Fiel	d Label	-	 		
Se	t Subfield.					
Cle	ear subfiel	d				
4	0004	13222				
5	0005	21211				
6	0006	34443				
7	0007	23343				
8	8000	44444				
9	0009	44444				
10	0010	11111				
11	0011	43344				
12	0012	11111				
13	0013	11121				
14	0014	13243				
15	0015	33222				-
•					•	_

In this case, the Field (columns 1 to 6) contains the data for the Case Number variable, so we give it the label Case Number, and click OK:

Field Property	X
Field label(col 1 to col 6):	ОК
Case Number	Cancel
Type: Integer 🔹	

Then we move to the right, and double-click between the column headers **7** and **8**; then **8** and **9** then **9** and **10**; and then **10** and **11** to get the vertical separation lines shown below.

K IRTPRO	- [simul5.fi	xed]		
Eile y	<u>/</u> iew <u>H</u> elp			_ & ×
🗅 🖻 🖬	X 🖻 🖻	8		
	*			A
	12345	67890	1 0 1	Ξ
1	0001	4244	14	
2	0002	1222	21	
3	0003	3221	12	
4	0004	1322	22	
5	0005	2121	11	
6	0006	3444	13	
7	0007	2334	13	
8	8000	4444	14	
9	0009	4444	14	
10	0010	1111	11	
11	0011	4334	14	
12	0012	1111	11	
13	0013	1112	21	
14	0014	1324	13	
15	0015	3322	2 2	~
•				•

Once this is done, we right-click on the empty gray rectangle above the column heading 7; that again brings up the **Field Property** dialog. In this case, we enter the label **Item1** and click **OK**:

Field Property	
<u>F</u> ield label(col 7):	ОК
Item1	Cancel
Type: Integer 💌	

Repeat this procedure by right-clicking, in turn, on the empty gray rectangles above the column headings 8, 9, 10 and 11 and enter the item names Item2, Item3, Item4, and Item5 respectively.

🔀 IRTPRO - [s	simul5.fixed]	
File View	v Help	_ 8 ×
	, B 🖻 🥔 📍	
	* * * * *	A
1	2 3 4 5 6 7 8 9 0 1	=
1 0	001 4244	
Field Pro	operty	
<u>F</u> ield	label(col 11):	ок
Item	5	Cancel
Туре:	Integer 🗸	
11 0	011 43344	
12 ()	012 11111	
13 ()	013 1112 <mark>1</mark>	
14 0	014 13243	
15 0	012 222	· ·
		P
		.11

Once the **OK** button is clicked (see image above) after entering the last item name, each rectangle will be marked by an * symbol, and the **File** menu becomes active. We select **Save as IRTPRO Data File** from the **File** menu:

🔀 IRT	K IRTPRO - [simul5.fixed]						
Fi	le View Help						
D	New	Ctrl+N					
	Open	Ctrl+O					
	Close						
	Save	Ctrl+S					
	Save as IRTPRO Data File						
	Print Setup						
	1 simul5.fixed						
	2 simul5it.ssig						
	3 simul5items.ssig						
	4 Anger6IT.ssig						
	5 simul5.ssig						
	Exit						
	¹¹ 0011 43344 ¹² 0012 11111						

This brings up the standard **Save As** dialog, and we save the file as **Simul5.ssig** (or whatever name we might prefer, with the extension.**ssig**):

🔀 Save As	-	and the set		x
Save <u>i</u> n:	👢 Simulated	•	3 🤌 📂 🛄 🗸	
Ca	Name	*	Date modified	
Recent Places		No items match your sear	rch.	
Desktop				
Libraries				
Network	•	111		•
	File <u>n</u> ame:	simul5.ssig	▼ <u>S</u> ave	
	Save as <u>t</u> ype:	IRTPRO Data File (*.ssig)	▼ Cancel	

In this case, unlike when the **Import** option is used, the new **.ssig** file opens immediately.

🔀 IRTPRO - [simul5.ssig]							
File Edit Data Manipulate Graphics Analysis View Window Help							
🗋 🗅 🚔	📙 X 🖻	e 🥔 📍					
	Case Number	Item1	ltem2	Item3	Item4	ltem5	•
1	1	4	2	4	4	4	Ξ
2	2	1	2	2	2	1	
3	3	3	2	2	1	2	
4	4	1	3	2	2	2	
5	5	2	1	2	1	1	
6	6	3	4	4	4	3	
7	7	2	3	3	4	3	
8	8	4	4	4	4	4	
9	9	4	4	4	4	4	
10	10	1	1	1	1	1	
11	11	4	3	3	4	4	
12	12	1	1	1	1	1	
13	13	1	1	1	2	1	
14	14	1	3	2	4	3	
15	15	3	3	2	2	2	Ŧ
•	×						
Ready							đ

It is important to remember to set the Missing Value Code, if there are missing values in the data, as described in the previous section:

🔀 IRTPRO - [simul5.ssig]							
📑 Fil	e Edit	Data	Manipulate	Graphics	Analys		
Insert Variables							
	🗋 🖻 📕 👗 🛛 Delete Variables						
	Case Nur Insert Cases						
1	1		Delete Cases				
2	2						
3	3 3 Variable Properties						
4	4 4 Missing Value Code						
5	5						
6	6	Recalculate Item Counts					

Importing space delimited fixed-format files

If there are spaces between the columns in a fixed format file, one can import the file directly if the file is saved with an extension **.txt**. As an illustration, consider the same simulated dataset used above, but in this instance saved with spaces between each variable:

simul5it	.txt	_		X	
<u>F</u> ile <u>E</u> dit	F <u>o</u> rma	at <u>V</u> i	iew	<u>H</u> elp	
0001 4	2 4	4 4			•
0002 1	22	$\frac{2}{1}\frac{1}{2}$			Ξ
0004 1	3 2	2 2			
0005 2	12	1 1 1 3			
0007 2	33	4 3			
0008 4	4 4	44			
00009 4	1 1	1 1			
0011 4	33	4 4			
0012 1	$11 \\ 11$	$\frac{1}{2}$ 1			
0014 1	3 2	4 <u>3</u>			
0015 3	32	22			
0010 2	$\frac{2}{3}$ $\frac{2}{3}$	33			
0018 3	31	32			
0019 4	22 44	13 44			_
4				Þ	×
		_	_		-11

Use the File, Import option and select files of type (*.txt, *.csv). Browse for the file simul5it.txt stored in the folder IRTPRO Examples\By Dataset\Simulated and click the Open button:

🔀 Open				X
Look <u>i</u> n:	👢 Simulated	•	G 🤌 🛤	୭▼
Recent Places Desktop Libraries	Name simul5it.txt	v		Date modified 7/20/2011 8:46 PM 7/20/2011 8:47 PM
Computer Computer Network	 ✓ File <u>n</u>ame: Files of <u>type</u>: 	iii simul5it.bt ASCII File - Delimited(*.bt,*.csv)		▼ <u>Open</u> ▼ Cancel

This action will prompt the user to save the IRTPRO data file:

Save As				×
Save <u>i</u> n:	👢 Simulated		- G 🕫 🖻	۶ 🛄 🛨
Recent Places Desktop Libraries Computer	Name	*		Date modified 7/20/2011 9:48 PM 7/21/2011 11:59 AM
Network	•			4
	File <u>n</u> ame:	simul5it.ssig		Save
	Save as type:	System Data File (*.ssig)		▼ Cancel

A portion of this file is shown below.

🔀 IRTPRO - [simul5it.ssig]										
Eile	e <u>E</u> dit <u>D</u> a	ta <u>M</u> anipu	late <u>G</u> raphi	cs <u>A</u> nalysis	<u>V</u> iew <u>W</u> i	ndow <u>H</u> elp	×			
	Col1	Col2	Col3	Col4	Col5	Col6	•			
1	1	4	2	4	4	4	Ξ			
2	2	1	2	2	2	1				
3	3	3	2	2	1	2				
4	4	1	3	2	2	2				
5	5	2	1	2	1	1				
6	6	3	4	4	4	3				
7	7	2	3	3	4	3				
8	8	4	4	4	4	4				
9	9	4	4	4	4	4				
10	10	1	1	1	1	1				
11	11	4	3	3	4	4				
12	12	1	1	1	1	1				
13	13	1	1	1	2	1				
14	14	1	3	2	4	3				
15	15	3	3	2	2	2	T			
1 C							•			
Ready							NL .#			

The default column names are Col1, Col2,.... To rename, use the **Data**, **Variable Properties...** option.

1.3 Importing Comma-delimited Data

Comma-delimited .csv files represent another commonly used format from which IRTPRO can import data. While it is possible that IRTPRO will not properly open certain types of Excel ".xls" worksheet files, Excel will also save data as comma-delimited, and that can be used if the data are in an Excel-readable format. While tab- or space-delimited data are also commonly used, IRTPRO cannot currently open those files. However, one can use a text editor to change tabs to commas, and then one has a comma-delimited file that IRTPRO can open.

To begin the data-import process, one starts IRTPRO and selects Import... under the File menu:

X I	X IRTPRO									
File	View Help									
	New	Ctrl+N								
	Open	Ctrl+O								
	Import									
	Print Setup									
	1 Efficacy_cfa.irtpro									
	2 Asthma34.ssig									
	3 Asthma34.irtpro									
	4 Anxiety14itemsV7.irtpro									
	5 Isat6-3plPriors.irtpro									
	Close									
	Exit									

This brings up a standard **Open File** dialog; in the lower center is a pop-up menu from which the user may select one of a large number of formats:

Flexible Professional Its	em Response Theory M	ASCII File - Delimited(*.txt*.csv) (ASCII File - Fixed Format (S/T Schema)(*.sts)	*	
🔀 Open		ASCITTIE - Fixed Format (All Schemas)(".fix) dBASE(*.dbf) Evcel(*.vis)		X
Look in:	🗼 CFA	Epi Info(*.rec) Gauss(*.dat) Gauss – Unix(*.dat)		
Ca	Name	HTML Table(*.htm*)		dified
Recent Places		JMP(*.jmp) LIMDEP for Windows(*.lpj)	Ш	
		Matlab Matrix(*.mat) Mineset(*.schema;*.sch)		
Desktop		Minitab(*.mtw) OSIRIS(*.dct*.dict)		
		Paradox(*.db) Quattro Pro(*.wq?,*.wb?) S-Plus(*.ssc.)		
Libraries		SAS Data File - Versions 7/8/9(*.sd7;*.sas7bdat)		
		SAS V6 Data File - Windows/OS2(*.sd2) SAS V6 Data File - Windows/OS2(*.sd2) SAS V6 Data File - Dec Unix(*.ssd04)		
Computer		SAS(Sun) Data File - Versions //8/9(*.sd/;*.sas/bdat) SAS(Alpha) Data File - Versions 7/8/9(*.sd7;*.sas7bdat)		
	•	SAS Transport File(*.xpt*.tpt) SAS Program & Data File(*.sas)		4
Network	File name:	SPSS Data File(*.sav) SPSS Data File - HP,IBM, & Sun Unix(*.sav)	Ŧ	Open
	Files of type:	ASCII File - Delimited(*.txt;*.csv)		Cancel
		Open as read-only		

Here, we select ASCII File – Delimited (*.txt,*.csv).

Then we navigate to the folder that contains the .csv file we wish to import, and Open it:

🔀 Open					X
Look <u>i</u> n:	👢 Anger	•	G 🤌 🖻	۶ 🛄 ◄	
Recent Places	Name	•		Date mod 6/6/2011	ified 4:19 PM
Desktop					
Libraries					
Computer					
	•				· ·
Network	File <u>n</u> ame: Files of <u>t</u> ype:	ASCII File - Delimited(*.txt,*.csv)		•	Open Cancel
		Open as <u>r</u> ead-only			

In this case, as an example, we are using the file **Anger6IT.csv** which contains the same data as the **Anger6IT.fixed** file used in the previous section, except that the data in **Anger6IT.csv** are comma-delimited, one line per observation, instead of in fixed columns. When we **Open** the file, a standard **Save As** dialog appears

🔀 Save As					X
Save <u>i</u> n:	👢 Anger	• G) 🗊 📂	.	
Ca	Name	A	1	Date modified	
Recent Places		No items match your sear	ch.		
Desktop					
Libraries					
Computer					
Network	•	III			4
	File <u>n</u> ame:	Anger6IT.ssig		▼	ave
	Save as <u>t</u> ype:	System Data File (*.ssig)		▼ C	ancel

and we **Save** the file as **Anger6IT.ssig**. After one clicks **Save**, the file is saved as an **.ssig** file, and the user has the opportunity to **Open** it to begin the analysis:

Finish Import	X
Done importing. Do you	want to open Anger6IT.ssig
	Yes No

If one clicks **Yes**, the file opens.

It is again important to remember to set the Missing Value Code as described in Section 1.1.

🔀 IRTI	PRO - [Ar	nger6IT.ssig]							
📄 Fil	e Edit	Data Man	ipulate G	raphics An	alysi	s View	Window	Help	
🗅 🖻	8 8	Insert	Variables						
	Group	Delete	Variables		[Anger	4 Ang	ger5	Anger6
1	1	Insert (ases		[2	2	3	
2	1	Delete	Casas			1	2	3	
3	1	Delete	Cases			1	2	3	
4	1	Variab	le Propertie	es		2	2	3	
5	1	Missin	n Value Cor	le		1	2	2	
6	1	1113511	g value cot			2	2	3	
7	1	Recalc	ulate Item (Counts		1	2	1	
8	1	3	2	2	_	3	3	3	
9	1	2	1	1		1	1	1	
10	1	3	2	3		2	3	3	
9 10	1	2 3	1 2	1		1	1	1	

There are many other ways to "get data into" IRTPRO, but they are variations on the procedures described in this document. If you encounter difficulties opening a file of some particular format, please let us know. However, in the interim, a good work-around would be to re-write or save the file in one of the formats that IRTPRO *does* successfully read, and proceed from there.

1.4 Data Manipulation: Data menu

1.4.1 Introduction

To demonstrate the data manipulation options available in IRTPRO, we use the dataset **AnxietyItems.ssig.** To see the data, use the **Open** file dialog under the **File** menu, navigate to the **C:\IRTPRO Examples\By Dataset\Anxiety14** folder, select **Files of type: IRTPRO Data File** (*.ssig) in the **Open File** dialog, and open the file **AnxietyItems.ssig**. There are eight variables and the first ten cases are shown below.

🔀 IRTF	🔀 IRTPRO - [AnxietyItems.ssig]										
Eile Edit Data Manipulate Graphics Analysis View Window Help											
🗋 🗅 🖻											
	ltem1	ltem2	Item3	ltem4	ltem5	ltem6	V13	V14			
1	3	2	2	3	3	2	2	3	Ξ		
2	3	5	5	3	4	3	4	2			
3	3	3	3	3	1	4	1	2			
4	3	2	2	3	2	3	2	3			
5	2	2	4	3	4	4	4	4			
6	1	1	1	1	1	2	1	1			
7	3	1	1	2	1	1	2	2			
8	1	2	1	1	1	1	1	1			
9	3	3	1	3	2	1	1	4			
10	3	2	1	2	2	1	2	2	Ŧ		
•	1								•		
Ready								NUM			

If the spreadsheet is the current window, the main menu bar displays the **Data**, **Manipulate**, **Graphics** and **Analysis** options. The list of available options from the **Data** drop-down menu is next.

🔀 IRTF	K IRTPRO - [AnxietyItems.ssig]											
File	File Edit Data Manipulate Graphics Analysis											
🗋 🗅 🚔	H %	Insert Variables										
	ltem1	Delete Variables										
1	3	Insert Cases										
2	3	D L L C										
3	3	Delete Cases	1									
4	3	Variable Properties	2									
5	2	Missing Value Code	4									
6	1	wissing value code	1									
7	3	Recalculate Item Counts	1									

1.4.2 Delete variables or cases

Selection of the **Data**, **Delete Variables**... option provides the user with access to the **Delete Variables** dialog. In the following demonstration, the variables V13 to V14 are deleted by selecting the **Delete from:** drop-down list and then the **Delete to:** drop-down list.

Delete Variables		X
Delete from: V13) <u>t</u> o:	Item1 🗸
	🔘 to <u>e</u> n	Item1 GItem2 Item3
Delete 1 A variables, gtarting free	om Item	Item4 Item5 Item6 V13
More »	OK	V14 Cancel

By clicking the OK button, the revised spreadsheet is displayed. These changes have not

been made to the original data yet and therefore an asterisk (*) sign is appended to the file name, as shown in the top pane of the IRTPRO window. Use the **File**, **Save** option to make the changes permanent.

🔀 IR	TPRO - [Anxie	tyItems.ssig	*]	his winds	-	moninion	_ D _ X	
	ile <u>E</u> dit <u>D</u> a	ita <u>M</u> anipul	late <u>G</u> raphi	cs <u>A</u> nalysis	<u>V</u> iew <u>W</u> i	ndow <u>H</u> elp	- 8	×
	🗲 🖬 % 🖻	6 8						
	Item1	Item2	Item3	Item4	ltem5	ltem6		
1	3	2	2	3	3	2		
2	3	5	5	3	4	3		
3	3	3	3	3	1	4		
4	3	2	2	3	2	3		
5	2	2	4	3	4	4		-
							Þ	
							NUM	.di

To delete cases from the data, select the **Data**, **Delete Cases**... option and make the required selections using the **Delete Cases** dialog.

Delete Cases	1 1	X
● Delete 1	cases, starting from case 1	
Delete from case:	▲ <u>to</u> case; 1	×
🔘 Delete <u>a</u> ll cases		
	ОК	Cancel

1.4.3 Renaming Variables

Next, we would like to rename the variable names Item1 to Item6. These names are to be replaced by Calm, Tense, Regretful, AtEase, Anxious, and Nervous. Select the **Variable Properties...** option from the **Data** menu to activate the **Properties** dialog.

IRTPRO - [AnxietyItems.ssig]									
File Edit Data Manipulate Graphics Analysis View Window He									
🗅 🖻	H X	I		1					
	Item1 Delete Variables						ltem6		
1	3	Б	nsert Cases	3	}	2			
2	3		Nolata Casas		4	ļ.	3		
3	3	L	Jelete Cases		1		4		
4	3	V	/ariable Properties		2	2	3		
5	2	Ν	Aissing Value Code		4	ļ	4		
			moonly value code						
		R							

Starting with Item1 in the Name: drop-down list, click the Rename ... button and change the

name to Calm (see the two dialogs below).

rope	erties					-	
Nar	me: Item1		•	Rename	·		
_							
Тур	pe: Fixed poi	nt	•	<u>T</u> ype:	Discrete		•
							_
<u>D</u> es	scription:						
V	alues						
	Item	Count	Label				
	1	114					
	2	204 143					
	4	47					
	5	9					
1							
						Edit	
	01						
	ОК	Cancel					
IR	RTPRO					X	
	Variable na	ame					÷.
	Calm						
	ОК	Can	cel				

Click the **OK** button to return to the **Properties** dialog. Repeat the above procedure for Item2 to Item6.

Properti	es				-		
<u>N</u> ame Type: <u>D</u> escr	Anxious Calm Tense Regretful AtEase Anxious Tip Item6		-	<u>R</u> ename	Discrete		•
Val. 11 2 3 4 5	ies iem	Count 153 196 111 54 3	Label				
	ок	Cancel				Edit	_

Once the last variable has been renamed by using the **Variable name** text box, click the **OK** button to return to the **Properties** dialog.

IRTPRO	-		X
Variable name			
Item6			
OK Car	icel		

When the **Properties** dialog is displayed, use the **OK** button to display the revised spreadsheet and then use the **File**, **Save** option to make the changes to **AnxietyItems.ssig** permanent.

🔀 IRTA	🔀 IRTPRO - [AnxietyItems.ssig *]									
Eil	📰 Eile Edit Data Manipulate Graphics Analysis View Window Help - 🖻									
	×									
🗋 🗅 🚔	📙 X 🖻	2 3 ?								
	Calm	Tense	Regretful	AtEase	Anxious	Nervous	^			
1	3	2	2	3	3	2	Ξ			
2	3	5	5	3	4	3				
3	3	3	3	3	1	4				
4	3	2	2	3	2	3				
5	2	2	4	3	4	4	-			
•										
Ready	Ready NL #									

1.4.4 Missing value code

To set the missing value code, select the Missing Value Code... entry under the Data menu:



That brings up a **Missing Value Code** dialog into which the user may enter the code (-1 is the default, but is also the code for this data) and click on **OK**.

Missing Value Code		X
Missing value	1	OK Cancel

After that is done, it is important to **Save** the **.ssig** file by using the **File**, **Save** option. Once the missing value code has been set, and the **.ssig** file has been saved, the missing data code will be stored within the **.ssig** file and IRTPRO will "remember" the code in subsequent uses of the data.

1.4.5 Insert variables or cases

Suppose that we want to insert two new variables into **AnxietyItems.ssig** before the item Calm and then rename the new variables to SumScore and CalmRecoded. To proceed, select the **Data**, **Insert Variables...** option.

🔀 IRT	🔀 IRTPRO - [AnxietyItems.ssig]									
📑 Fi	File Edit Data Manipulate Graphics Analysis View Window He									
			Insert Variables		1				×	
0 🖆	¥ 🖪 🛛 🐰		Delete Variables							
	Calm		Insert Cases			Anxious	Nervous		•	
1	3		Delete Cases		L	3	2		Ξ	
2	3				L	4	3			
3	3		Variable Properties			1	4			
4	3		Missing Value Code			2	3			
5	2					4	4		Ŧ	
•	1	_	Recalculate Item Counts				1	Þ		
								NU		

Selection of this option activates the **Insert Variable(s)** dialog. Make the selections shown below and click **OK**.

Insert Variable(s)		×
Insert Append	variables	Calm 🔹
		OK Cancel

The revised spreadsheet is displayed with default variable names VAR0 and VAR1 and with all the corresponding data cells filled with the missing value code. Use the **File**, **Save** option to make the changes to **AnxietyItems.ssig** permanent.

🔀 IR	🔀 IRTPRO - [AnxietyItems.ssig *]									
	📰 Eile Edit Data Manipulate Graphics Analysis View Window Help – 🖃									
	×									
D	🛎 🖪 3	6 B B 🕹	Ŷ							
	VA	RO VAF	R1 Calm	Tense	Regretful	AtEase	Anxious	-		
1	-1	-1	3	2	2	3	3	Ξ		
2	-1	-1	3	5	5	3	4			
3	-1	-1	3	3	3	3	1			
4	-1	-1	3	2	2	3	2			
5	-1	-1	2	2	4	3	4	Ŧ		
•										
							NL	đ		

Rename VAR0 to SumScore and VAR1 to CalmRecoded.

1.5 Data Manipulation: Manipulate menu

Currently, the only option available from the **Manipulate** menu, is the **Recode...** option as shown. This option is selected in what follows.

X	🔀 IRTPRO - [AnxietyItems.ssig]										
	💽 File Edit Data Manipulate Graphics Analysis View Window Help 🗕 🖻										
			Rec	ode					×		
) 🖻	📙 X 🖻	C 🖉 🎖 🕇		_						
		SumScore	CalmRecoded	Calm	Tense	Regretful	AtEase	Anxious			
	1	-1	-1	3	2	2	3	3	Ξ		
	2	-1	-1	3	5	5	3	4			
	3	-1	-1	3	3	3	3	1			
	4	-1	-1	3	2	2	3	2			
	5	-1	-1	2	2	4	3	4	-		
•	· · · · · · · · · · · · · · · · · · ·							Þ			
								NU			

1.5.1 Recoding item scores

Suppose, for example, that we want to define a new variable called CalmRecoded by combining the fourth and fifth categories of the item Calm. In Section 1.4.3 the **Properties** dialog showed that the five distinct values of Calm are 1, 2, 3, 4, and 5. Therefore, we want to recode these values so that, for the new variable CalmRecoded 5 = 4 and all the remaining data values remain unchanged. This recoding is accomplished by selection of the **Manipulate**, **Recode...** option to invoke the **Data Manipulation** window.

When using the if () statement, follow the next rules:

Click with mouse pointer within the () brackets, then double-click on Calm or drag Calm to within the () brackets.

Click on the appropriate operator from the following list:

- \circ < (Less than)
- \circ <= (Less than or equal to)
- \circ >= (Greater than or equal to)
- \circ > (Greater than)
- != (Not equal to)
- == (Equal to, see usage below)

Data Manipulation	ter Bridge State		X
Variables: + × SumScore CalmRecoded Calm Tense Regretful AtEase Anxious Nervous	Functions: Abs() Exp() Ln() Rand() Randomize() Sqrt() if (Calm == 5) then CalmRecoded = 4 else CalmRecoded = Calm endif	ifend if if <	elseendif
		ОК	Cancel

Click **OK**, then save the data file and select **Data**, **Properties**... from the main menu bar to verify that CalmRecoded has four categories.

Type: Fixed p					
	oint	•	<u>T</u> ype:	Discrete	•
Description:					
Item	Count	Label			
1	114				
3	143				
4	56				
					Edit
ОК	Cancel				

1.5.2 Calculating the sum of two or more variables

Suppose that the new variable SumScore equals the sum of the six items, CalmRecoded and Tense to Nervous. In the illustration below we used three statements. After the first statement is entered, use the **Enter** button to advance to the next line. Variables are entered onto the **Compute** window by either double-clicking or dragging.

Data Manipulation		
Variables: + × SumScore CalmRecoded Calm Tense Regretful AtEase Anxious Nervous	Functions: Abs() Exp() Ln() Rand() Randomize() Sqrt() Sqrt() SumScore = CalmRecoded SumScore = SumScore + SumScore = SumScore +	ifend ififelseendif $< <= >= > != ==$ () ^ %Backspace 2 8 9 /Delete 4 5 6 *1 2 3 -0 . = +d + TenseRegretful + AtEaseAnxious + Nervous
		OK Cancel

Click the **OK** button and use the **File**, **Save** option to make the changes to the file **AnxietyItems.ssig** permanent. The distribution of the SumScore values is shown below.

