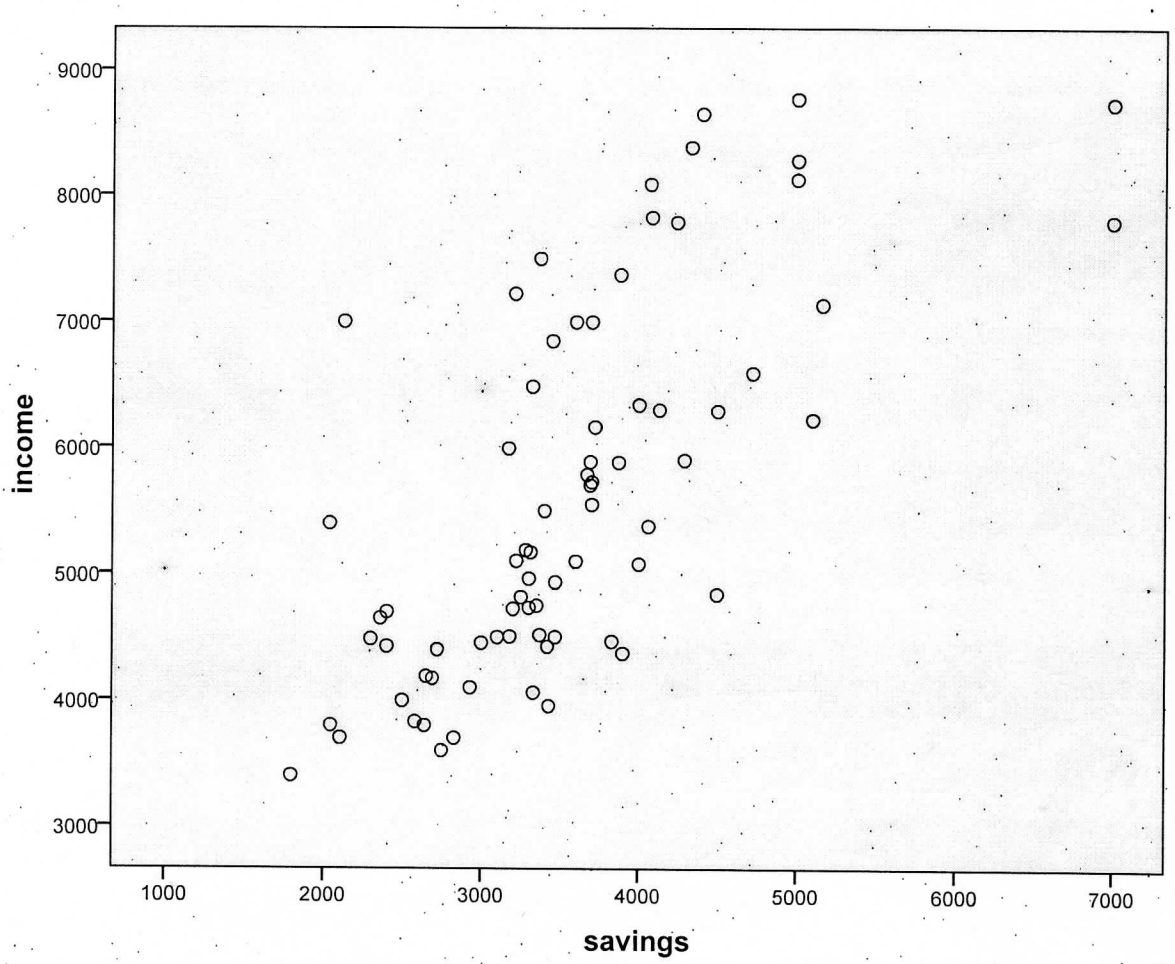
```
GRAPH
  /SCATTERPLOT(BIVAR)=savings WITH income
  /MISSING=LISTWISE.
```

Graph

```
[DataSet0]
```




```
SAVE OUTFILE='C:\BACKUP\APPLIED STATISTICS\Data_set_10 (Diagrams).sav'
  /COMPRESSED.
```

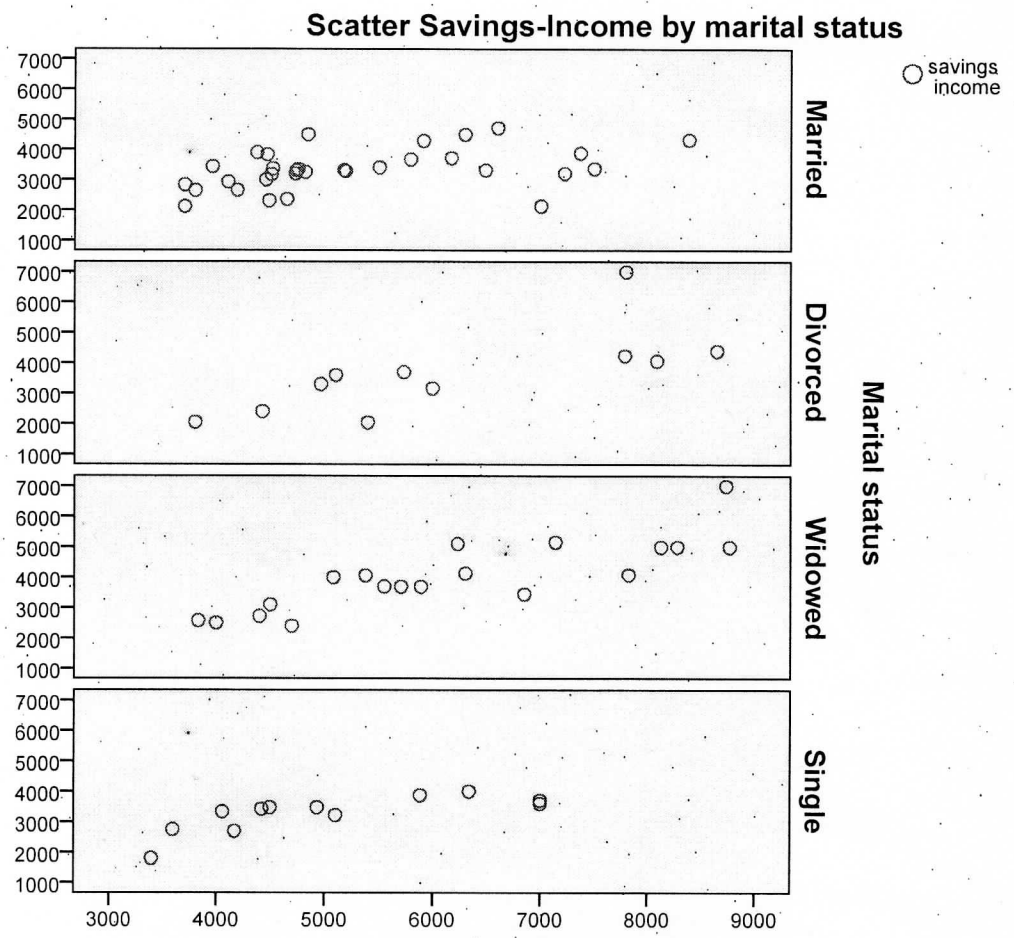
Y X

Scatterplot Income – Savings

```
GRAPH
  /SCATTERPLOT(OVERLAY)=income WITH savings (PAIR)
  /PANEL ROWVAR=marital ROWOP=CROSS
  /MISSING=LISTWISE
  /TITLE='Scatter Savings-Income by marital status'.
```

Graph

```
[DataSet0] C:\BACKUP\APPLIED STATISTICS\Data_set_10 (Diagrams).sav
```



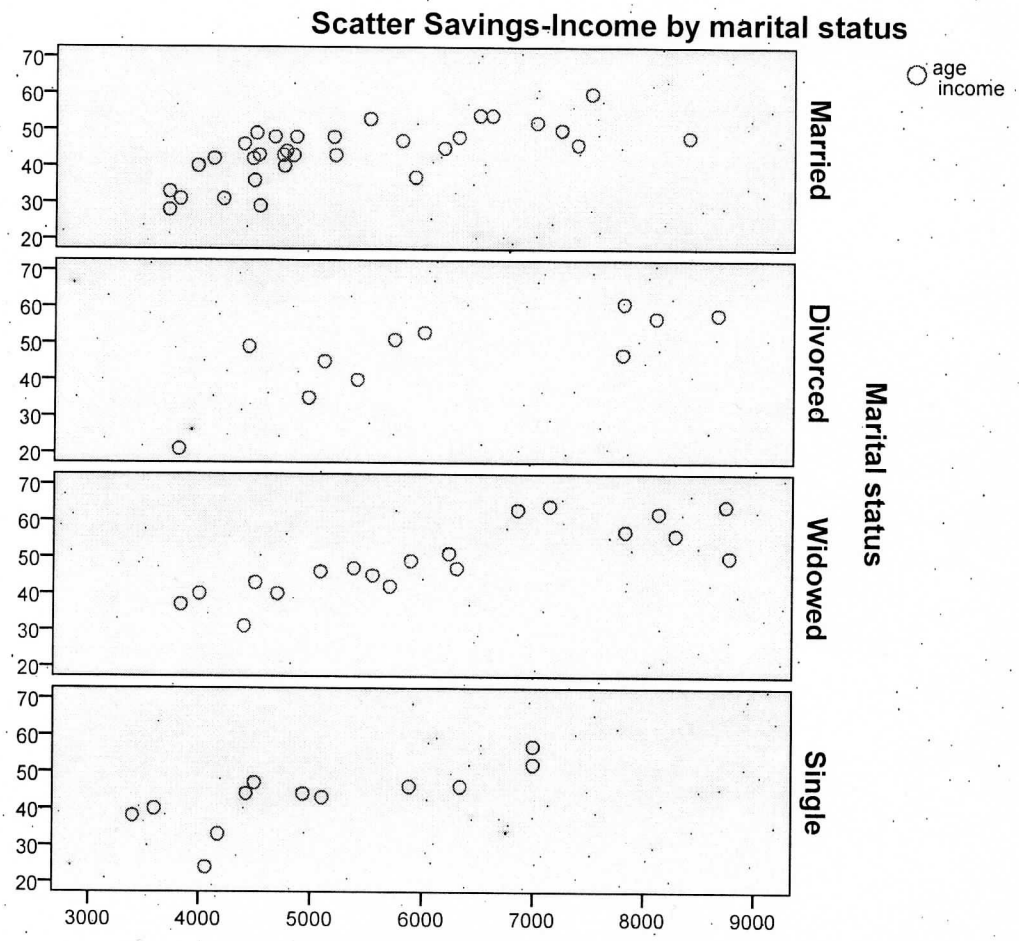
Scatterplots Savings Y by Marital Status
Income X

1: Single 2: Married 3: Widowed 4: Divorced

```
GRAPH
  /SCATTERPLOT(OVERLAY)=income WITH age (PAIR)
  /PANEL ROWVAR=marital ROWOP=CROSS
  /MISSING=LISTWISE
  /TITLE='Scatter Savings-Income by marital status'.
```

Graph

```
[DataSet0] C:\BACKUP\APPLIED STATISTICS\Data_set_10 (Diagrams).sav
```




```
NEW FILE.
DATASET NAME DataSet1 WINDOW=FRONT.
```

Scatterplots age (Y) – Income (X) by Marital Status

** Μάνα του λάθχο
*

```
CORRELATIONS
  /VARIABLES=systol diastol gluco cholest
  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES XPROD
  /MISSING=PAIRWISE.
```

π.χ. → $H_0: \rho_{systol,diastol} = 0.674$
$H_1: \rho \neq 0.674$
και δείχνει αν απορρ. ή όχι τη H_0 σε $\alpha = 0.05$ (*) ή σε $\alpha = 0.01$ (**)

Correlations

[DataSet1] C:\BACKUP\APPLIED STATISTICS\Data_set_11.sav

Descriptive Statistics

	Mean	Std. Deviation	N
systol	16,5292	1,66641	24
diastol	10,2000	1,26971	24
gluco	1,0142	,28369	24
cholest	263,7917	46,92731	24

ΠΕΡΙΓΡΑΦΙΚΑ ΜΕΤΡΑ ΓΙΑ ΟΛΕΣ ΤΙΣ ΜΕΤΑΒΛΗΤΕΣ

Correlations

		systol	diastol	gluco	cholest
systol	Pearson Correlation	1	,674**	,122	,418*
	Sig. (2-tailed)		,000	,571	,042
	Sum of Squares and Cross-products	63,870	32,790	1,324	752,646
	Covariance	2,777	1,426	,058	32,724
	N	24	24	24	24
diastol	Pearson Correlation	,674**	1	-,099	,582**
	Sig. (2-tailed)	,000		,644	,003
***	Sum of Squares and Cross-products	32,790	37,080	-,824	797,900
	Covariance	1,426	1,612	-,036	34,691
	N	24	24	24	24
gluco	Pearson Correlation	,122	-,099	1	,189
	Sig. (2-tailed)	,571	,644		,377
	Sum of Squares and Cross-products	1,324	-,824	1,851	57,851
	Covariance	,058	-,036	,080	2,515
	N	24	24	24	24
cholest	Pearson Correlation	,418*	,582**	,189	1
	Sig. (2-tailed)	,042	,003	,377	
	Sum of Squares and Cross-products	752,646	797,900	57,851	50649,958
	Covariance	32,724	34,691	2,515	2202,172
	N	24	24	24	24

→ Συντελεστής Pearson r
→ $H_0: \rho = 0$, $H_1: \rho \neq 0$
→ $\sum_{i=1}^{n} X_i \sum_{i=1}^{n} Y_i$ ή $\sum_{i=1}^{n} X_i^2$
→ πίνακας Covariances
→ Sample size

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

$$\frac{\sum_{i=1}^{n}(X_i-\bar{X})(Y_i-\bar{Y})}{n-1} = Cov(X,Y)$$

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n} \qquad \bar{Y} = \frac{\sum_{i=1}^{n} Y_i}{n}$$

```
NONPAR CORR
  /VARIABLES=systol diastol gluco cholest
  /PRINT=BOTH TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Nonparametric Correlations

```
[DataSet1] C:\BACKUP\APPLIED STATISTICS\Data_set_11.sav
```

Correlations

			systol	diastol	gluco	cholest
Kendall's tau_b	systol	Correlation Coefficient	1,000	,491**	,090	,335*
		Sig. (2-tailed)	.	,001	,549	,024
		N	24	24	24	24
	diastol	Correlation Coefficient	,491**	1,000	-,049	,340*
		Sig. (2-tailed)	,001	.	,745	,023
		N	24	24	24	24
	gluco	Correlation Coefficient	,090	-,049	1,000	,108
		Sig. (2-tailed)	,549	,745	.	,469
		N	24	24	24	24
	cholest	Correlation Coefficient	,335*	,340*	,108	1,000
		Sig. (2-tailed)	,024	,023	,469	.
		N	24	24	24	24
Spearman's rho	systol	Correlation Coefficient	1,000	,641**	,151	,458*
		Sig. (2-tailed)	.	,001	,481	,024
		N	24	24	24	24
	diastol	Correlation Coefficient	,641**	1,000	-,110	,477*
		Sig. (2-tailed)	,001	.	,610	,018
		N	24	24	24	24
	gluco	Correlation Coefficient	,151	-,110	1,000	,148
		Sig. (2-tailed)	,481	,610	.	,491
		N	24	24	24	24
	cholest	Correlation Coefficient	,458*	,477*	,148	1,000
		Sig. (2-tailed)	,024	,018	,491	.
		N	24	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

(***) Sum of Squares. Αν η μεταβλητή είναι με τον εαυτό της δίνει το $\sum_{i=1}^{n} X_i^2$

αν η μεταβλητή X είναι με την Y δίνει το $\sum_{i=1}^{n} X_i \cdot \sum_{i=1}^{n} Y_i$

Όμοια αυτός ο πίνακας δίνει συσχετίσεις Kendall, Spearman.

```
NEW FILE.
DATASET NAME DataSet2 WINDOW=FRONT.

SAVE OUTFILE='C:\BACKUP\APPLIED STATISTICS\DATA_SET_12.sav'
  /COMPRESSED.
CORRELATIONS
  /VARIABLES=HEIGHT WEIGHT AGE
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Correlations

[DataSet2] C:\BACKUP\APPLIED STATISTICS\DATA_SET_12.sav

Correlations

		HEIGHT	WEIGHT	AGE
HEIGHT	Pearson Correlation	1	,972**	,874*
	Sig. (2-tailed)		,000	,010
	N	7	7	7
WEIGHT	Pearson Correlation	,972**	1	,918**
	Sig. (2-tailed)	,000		,004
	N	7	7	7
AGE	Pearson Correlation	,874*	,918**	1
	Sig. (2-tailed)	,010	,004	
	N	7	7	7

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Συσχέτιση Pearson για HEIGHT WEIGHT AGE

```
PARTIAL CORR
  /VARIABLES=HEIGHT WEIGHT BY AGE
  /SIGNIFICANCE=TWOTAIL
  /MISSING=LISTWISE.
```

Partial Corr

[DataSet2] C:\BACKUP\APPLIED STATISTICS\DATA_SET_12.sav

Correlations

Control Variables			HEIGHT	WEIGHT
AGE	HEIGHT	Correlation	1,000	,878
		Significance (2-tailed)	.	,021
		df	0	4
	WEIGHT	Correlation	,878	1,000
		Significance (2-tailed)	,021	.
		df	4	0

Μερική συσχέτιση HEIGHT-WEIGHT απομακρύνοντας τις επιδράσεις της AGE

Μικρότερη τιμή 0.878 από 0.972

$\hat{\alpha} = 0.021$

Για $\alpha = 0.05$ η $H_0: \rho = 0$ απορρίπτεται (όχι για $\alpha = 0.01$)

```
CORRELATIONS
  /VARIABLES=HEIGHT WEIGHT AGE
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Correlations

[DataSet2] C:\BACKUP\APPLIED STATISTICS\DATA_SET_12.sav

Correlations

		HEIGHT	WEIGHT	AGE
HEIGHT	Pearson Correlation	1	,972**	,874*
	Sig. (2-tailed)		,000	,010
	N	7	7	7
WEIGHT	Pearson Correlation	,972**	1	,918**
	Sig. (2-tailed)	,000		,004
	N	7	7	7
AGE	Pearson Correlation	,874*	,918**	1
	Sig. (2-tailed)	,010	,004	
	N	7	7	7

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).