



Which of the following statements is false?

- a) An increase equal to +1 in the final mark implies an income increase equal to 80 euros.
- b) The mark in the exam of business administration significantly affects the income.
- c) The mark in political economy negatively affects the income.

**Q06**

Which of the following is not a typical assumption about the errors of the classic linear regression model?

- a) Independence.
- b) Normality.
- c) Heteroschedasticity.

**Q07**

Why in the first step of the NPC method (the rescaling type transformation) two constants  $c_1$  and  $c_2$  are added in the numerator and in the denominator?

- a) To avoid that the transformed variables take values 0 and 1.
- b) To allow the comparability between the informative variables.
- c) Because this is a linear transformation.

**Q08**

Which of the following properties are consequences of the standardization of the original response variables?

- a) The transformed variables take values from zero to one.
- b) The transformed variables take values between one and  $+\infty$ .
- c) The transformed variables have null mean and variance equal to one.

**Q09**

In the Formula 1 championship in every race the score assigned to each pilot depends on the finishing position according to the following rule: the winner takes a score equal to 25, the second 18, the third 15, the fourth 12, the fifth 10, the sixth 8, the seventh 6, the eighth 4, the ninth 2 and the tenth 1. Let us consider the ranks (finishing positions) in the first four races of the best pilots and assume that the degrees of importance of the races are equal.

	AUS	BHR	CHN	RUS
Rosberg	1	1	1	1
Hamilton	2	3	7	2
Vettel	3	DNS	2	Ret
Raikkonen	Ret	2	5	3

By applying the NPC methodology with Tippett combining function what would be the ranking of the championship after these four races?

- a) 1<sup>st</sup>.: Rosberg; 2<sup>nd</sup>.: Hamilton, Vettel, Raikkonen.
- b) 1<sup>st</sup>.: Rosberg; 2<sup>nd</sup>.: Hamilton, 3<sup>rd</sup>.: Vettel, 4<sup>th</sup>.: Raikkonen.
- c) 1<sup>st</sup>.: Rosberg, Hamilton, 3<sup>rd</sup>.: Raikkonen, 4<sup>th</sup>.: Vettel.

**Q10**

What is the Scree Plot in Factor Analysis?

- a) A diagram to represent the factor loadings.
- b) A graph to represent the eigenvalues.
- c) A plot to represent the factor scores.

**Q11**

Which of the following properties does characterize both principal factor analysis and principal component analysis?

- a) The correlations between original response variables play a central role in the analysis.
- b) The distinction between explained variance and specific or unique variance.
- c) The starting point is the specification of the original response variables as linear function of the factors/components.

**Q12**

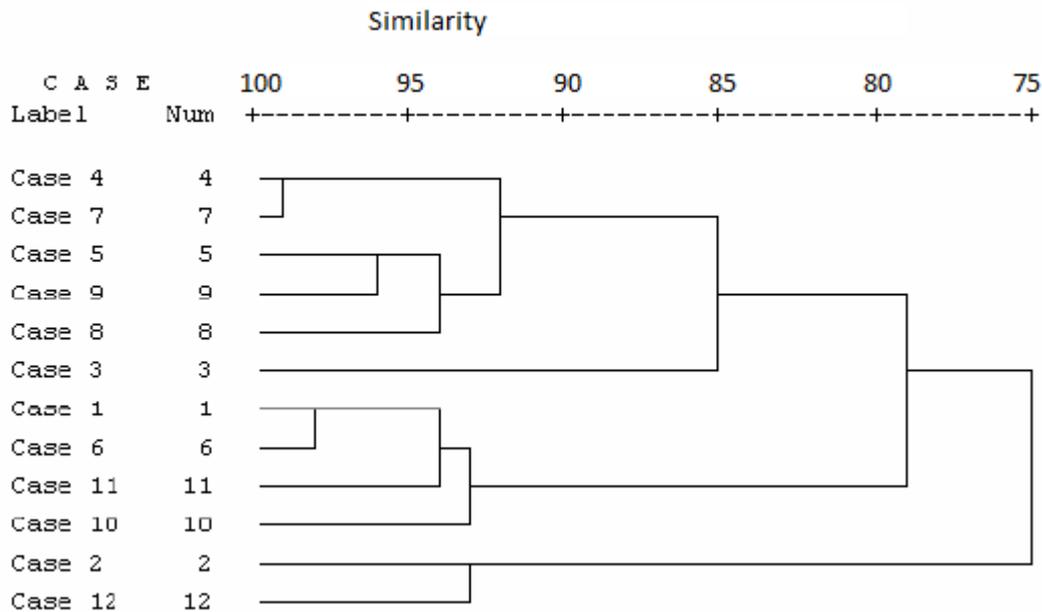
Which of the following is the R command to perform principal component analysis?

- a) *factanal( )*
- b) *princomponent( )*
- c) *prcomp( )*

**Q13**

Let us consider the following output of a Cluster Analysis performed on 12 customers (cases) to detect homogeneous market segments, according to the answers given in a questionnaire on buying behaviors.

Dendrogram using Ward Method



Which of the following clustering methods has been used?

- a) Hierarchical
- b) Non-hierarchical.
- c) None of the previous methods.

**Q14**

What is the number of clusters (segments) corresponding to a similarity level equal to 80?

- a) 2.
- b) 3.
- c) 4.

**Q15**

Which of the following properties does not characterize the non-hierarchical k-means method in cluster analysis?

- a) The number of clusters must be chosen before the cluster analysis.
- b) The centroids may change during the application of the procedure.
- c) The number of iterations cannot exceed the number of units minus one.