Package ‘T2Qv’

October 12, 2022

Type   Package
Title  Control Qualitative Variables
Version 0.1.0
Maintainer Wilson Rojas-Preciado <wrojas@utmachala.edu.ec>
Description Covers k-table control analysis using multivariate control charts for qualitative variables using fundamentals of multiple correspondence analysis and multiple factor analysis. The graphs can be shown in a flat or interactive way, in the same way all the outputs can be shown in an interactive shiny panel.
License MIT + file LICENSE
Encoding UTF-8
LazyData true
RoxygenNote 7.1.1
Depends R (>= 3.5)
Imports shiny, shinydashboardPlus, shinydashboard, shinycssloaders, dplyr, ca, highcharter, stringr, tables, purrr, tidyr, htmltools (>= 0.5.1.1)
Suggests testthat (>= 3.0.0)
Config/testthat/edition 3
NeedsCompilation no
Author Wilson Rojas-Preciado [aut, cre], Mauricio Rojas-Campuzano [aut, ctb], Purificación Galindo-Villardón [aut, ctb], Omar Ruiz-Barzola [aut, ctb]
Repository CRAN
Date/Publication 2022-05-18 17:00:04 UTC

R topics documented:

ACMconcatenated .......................................................... 2
ACMpoint ................................................................. 2
ACMconcatenated

Description
Multiple correspondence analysis applied to a concatenated table.

Usage
ACMconcatenated(base, IndK, interactive = TRUE)

Arguments
- base: Data set
- IndK: Character with the name of the column that specifies the partition of the data set in k tables.
- interactive: If it is TRUE, the graph will be shown interactively. If FALSE, the graph is displayed flat. FALSE is the default.

Value
A Multiple Correspondence Analysis graph of the concatenated table.

Examples
```r
data(Datak10Contaminated)
ACMconcatenated(Datak10Contaminated,"GroupLetter", interactive = TRUE)
```

ACMpoint

Description
Multiple correspondence analysis applied to a specific table.

Usage
ACMpoint(base, IndK, PointTable, interactive = TRUE)
**ChiSq\_variable**

**Arguments**

- **base**: Data set
- **IndK**: Character with the name of the column that specifies the partition of the data set in k tables.
- **PointTable**: Table indicator. A character or number that is part of the IndK registers. This argument specifies the table to which the analysis will be performed.
- **interactive**: If it is TRUE, the graph will be shown interactively. If FALSE, the graph is displayed flat. FALSE is the default.

**Value**

A Multiple Correspondence Analysis graph of the table specified in PointTable.

**Examples**

```r
data(Datak10Contaminated)
ACMpoint(Datak10Contaminated,"GroupLetter", PointTable="j", interactive=TRUE)
```

---

**ChiSq\_variable**  
*Chi squared variable from point table.*

**Description**

Contains Chi square distance between the column masses of the table specified in PointTable and the concatenated table. It allows to identify which mode is responsible for the anomaly in the table in which it is located.

**Usage**

```r
ChiSq\_variable(base, IndK, PointTable, interactive = TRUE, ylim = 0.09)
```

**Arguments**

- **base**: Data set
- **IndK**: Character with the name of the column that specifies the partition of the data set in k tables.
- **PointTable**: Table indicator. A character or number that is part of the IndK registers. This argument specifies the table to which the analysis will be performed.
- **interactive**: If it is TRUE, the graph will be shown interactively. If FALSE, the graph is displayed flat. FALSE is the default.
- **ylim**: y-axis limit.

**Value**

A table with Chi square distances between the column masses of the table specified in PointTable and the concatenated table.
Examples

```r
data(Datak10Contaminated)
ChiSq_variable(Datak10Contaminated, "GroupLetter", PointTable="j", ylim=5, interactive=TRUE)
```

---

**Datak10Contaminated**  
**10 Tables Data Set**

---

**Description**

Data from 10 tables with 10 categorical variables, the data from table 10 was generated with a different distribution from the others.

**Usage**

`Datak10Contaminated`

**Format**

A data frame:

- **V01** Contains 3 modes "High", "Medium", "Low".
- **V02** Contains 3 modes "High", "Medium", "Low".
- **V03** Contains 3 modes "High", "Medium", "Low".
- **V04** Contains 3 modes "High", "Medium", "Low".
- **V05** Contains 3 modes "High", "Medium", "Low".
- **V06** Contains 3 modes "High", "Medium", "Low".
- **V07** Contains 3 modes "High", "Medium", "Low".
- **V08** Contains 3 modes "High", "Medium", "Low".
- **V09** Contains 3 modes "High", "Medium", "Low".
- **V10** Contains 3 modes "High", "Medium", "Low".

**GroupLetter** Letters from "a" to "j" identify the k tables.
Full_Panel

Full Panel T2 Qualitative

Description

A shiny panel complete with the multivariate control chart for qualitative variables, the two ACM charts and the modality distance table. Within the dashboard, arguments such as type I error and dimensionality can be modified.

Usage

Full_Panel(base, IndK)

Arguments

base  Data set
IndK  Character with the name of the column that specifies the partition of the data set in k tables.

Value

A complete panel with the multivariate control chart for qualitative variables, the two ACM charts and the modality distance table.

Examples

data(Datak10Contaminated)
Full_Panel(Datak10Contaminated, "GroupLetter")

T2_qualitative  Multivariate control chart for qualitative variables

Description

Multivariate control chart T2 Hotelling applicable for qualitative variables.

Usage

T2_qualitative(base, IndK, dim, interactive = TRUE, alpha = 0.0027)
Arguments

- **base**: Data set
- **IndK**: Character with the name of the column that specifies the partition of the data set in k tables.
- **dim**: Dimension taken for reduction. Initial dimension - 1 is recommended.
- **interactive**: If it is TRUE, the graph will be shown interactively. If FALSE, the graph is displayed flat. FALSE is the default.
- **alpha**: Type I error, it is recommended to reach this value by using the ARL.

Value

A control chart made with the T2 hotelling statistic, applied to detect anomalies in any of the K tables obtained with the specification of IndK. The control limit of the graph is obtained from the number of dimensions dim and the type I error alpha.

Examples

data(Datak10Contaminated)
T2_qualitative(Datak10Contaminated,"GroupLetter",9, TRUE,0.0027)
Index

* datasets
  Datak10Contaminated, 4
  ACMconcatenated, 2
  ACMpoint, 2
  ChiSq_variable, 3
  Datak10Contaminated, 4
  Full_Panel, 5
  T2_qualitative, 5