

The AcceptanceSampling Package

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Type Package

Title Creation and evaluation of Acceptance Sampling Plans

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Description This package provides functionality for creating and evaluating acceptance sampling plans. Plans can be single,

Depends methods, R(>= 2.4.0), stats

Imports graphics

License GPL version 2 or newer

LazyLoad yes

R topics documented:

OC2c-class	2
OC2c	3
assess-methods	5

Index	6
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 OC2c-class

 Class Family "OC2c".

Description

The family "OC2c" ("Operating Characteristic" function) of classes provides methods for creating, plotting, printing and assessing single, double, and multiple acceptance sampling plans based on the Binomial ("OCbinomial"), Hypergeometric ("OChypergeom"), and Poisson ("OCpoisson") distributions.

Objects from the Class

The "OC2c" class is a virtual Class: No objects may be created from it.

However, objects from the derived classes can be created by calls of the form `new("OCbinomial", ...)`, for example, or preferably using the creator function `OC2c`.

Slots

n: Object of class "numeric". A vector of length k giving the sample size at each of the k stages of sampling, e.g. for double sampling $k=2$.

c: Object of class "numeric". A vector of length k giving the **cumulative** acceptance numbers at each of the k stages of sampling.

r: Object of class "numeric". A vector of length k giving the **cumulative** rejection numbers at each of the k stages of sampling.

type: Object of class "character". The possible types relate to the distribution on which the plans are based on, namely, `binomial`, `hypergeom`, and `poisson`

pd: Object of class "numeric". A numeric vector indicating the quality for which a probability of acceptance is calculated under the specified sampling plan. Meaning differs for the different types.

For "OCbinomial" this relates to the proportion of defectives created by the process.

For "OChypergeom" this relates to the proportion of population defectives created by the process.

For "OCpoisson" this relates to the rate of defects (per item) created by the process.

N: Object of class "numeric". Only for class "OChypergeom", a number giving the population (lot) size from which the sample is drawn.

paccept: Object of class "numeric". A numeric vector with the probability of acceptance which correspond to the quality as given by `pd`.

Methods

`plot` signature(x="OCbinomial", y="missing"), \signature(x="numeric", y="OCbinomial"), \signature(x="OChypergeom", y="missing"), \signature(x="numeric", y="OChypergeom"), \signature(x="OCpoisson", y="missing") or \signature(x="numeric", y="OCpoisson"):
 Plot the OC curve.

`show signature("OC2c")` or `signature("OChypergeom")`: Show the details of the sampling plan.

`summary signature("OC2c")` or `signature("OChypergeom")`: Summarise the sampling plan. Optional argument `full` (defaults to `FALSE`) will show the details at all quality values (`pd`) supplied when the object was created.

`assess signature(object="OC2c")`: Assess whether the sampling plan can meet the specified *Producer Risk Point (PRP)* and/or *Consumer Risk Point (CRP)*. For details see [assess, OC2c-method](#)

Author(s)

Andreas Kiermeier

References

Hald, A. (1981), *Statistical theory of sampling inspection by attributes*, Academic Press.

See Also

[OC2c](#)

OC2c

Operating Characteristics of an Acceptance Sampling Plan

Description

The preferred way of creating new objects from the family of "OC2c" classes.

Usage

```
OC2c(n,c,r=if (length(c)==1) c+1 else NULL, type=c("binomial","hypergeom", "poisson"
```

Arguments

<code>n</code>	A vector of length <code>k</code> giving the sample size at each of the <code>k</code> stages of sampling, e.g. for double sampling <code>k=2</code> .
<code>c</code>	A vector of length <code>k</code> giving the cumulative acceptance numbers at each of the <code>k</code> stages of sampling.
<code>r</code>	A vector of length <code>k</code> giving the cumulative rejection numbers at each of the <code>k</code> stages of sampling.
<code>type</code>	The possible types relate to the distribution on which the plans are based on, namely, <code>binomial</code> , <code>hypergeom</code> , and <code>poisson</code> .
<code>...</code>	Additional parameters passed to the class generating function for each type. See Details for options.

Details

Typical usages are:

```
OC2c(n, c)
OC2c(n, c, r, pd)
OC2c(n, c, r, type="hypergeom", N, pd)
OC2c(n, c, r, type="poisson", pd)
```

The first and second forms use a default `type` of "binomial". The first form can calculate r *only* when n and c are of length 1.

The second form provides a the proportion of defectives, `pd`, for which the OC function should be calculated (default is `pd=seq(0, 1, 0.01)`).

The third form states that the OC function based on a Hypergeometric distribution is desired. In this case the population size N also needs to be specified. In this case, `pd` indicates the proportion of population defectives, such that `pd*N` gives the actual number of defectives in the population. If N or `pd` are not specified they take defaults of $N=100$ and `pd=seq(0, 1, 0.01)`.

Value

An object from the family of `OC2c-class`, namely of class `OCbinomial`, `OChypergeom`, or `OCpoisson`.

See Also

[OC2c-class](#)

Examples

```
## A standard binomial sampling plan
x <- OC2c(10,1)
x ## print out a brief summary
plot(x) ## plot the OC curve
plot(x, xlim=c(0,0.5)) ## plot the useful part of the OC curve

## A double sampling plan
x <- OC2c(c(125,125), c(1,4), c(4,5), pd=seq(0,0.1,0.001))
x
plot(x) ## Plot the plan

## Assess whether the plan can meet desired risk points
assess(x, PRP=c(0.01, 0.95), CRP=c(0.05, 0.04))

## A plan based on the Hypergeometric distribution
x <- OC2c(10,1, type="hypergeom", N=5000, pd=seq(0,0.5, 0.025))
plot(x)

## The summary
x <- OC2c(10,1, type="hypergeom", N=5000, pd=seq(0,0.5, 0.1))
summary(x, full=TRUE)
```

```
## Plotting against a function which generates P(defective)
xm <- seq(-3, 3, 0.05) ## The mean of the underlying characteristic
x <- OC2c(10, 1, pd=1-pnorm(0, mean=xm, sd=1))
plot(xm, x) ## Plot P(accept) against mean
```

assess-methods *Assessment methods for the class family "OC2c".*

Description

Assess whether the sampling plan can meet the specified *Producer Risk Point (PRP)* and/or *Consumer Risk Point (CRP)*.

Arguments

object	An object of class OC2c.
PRP	The Producer Risk Point in the form of a two element numeric vector of the form $c(pd, pa)$. The first element specifies, pd , determines the quality level at which to evaluate the plan. The second element, pa , indicates the <i>minimum</i> probability of acceptance to be achieved by the plan.
CRP	The Consumer Risk Point in the form of a two element numeric vector of the form $c(pd, pa)$. The first element specifies, pd , determines the quality level at which to evaluate the plan. The second element, pa , indicates the <i>maximum</i> probability of acceptance to be achieved by the plan.
print	Logical indicating whether to print a summary of the assessment or not. Defaults to TRUE

Methods

object="OC2c" Assess whether the sampling plan can meet the provided producer and/or consumer risk point(s).

Usage

```
assess(object, PRP, CRP, print)
```

Author(s)

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See Also

[OC2c](#)

Index

*Topic **classes**

OC2c, [3](#)

OC2c-class, [1](#)

*Topic **methods**

assess-methods, [5](#)

assess (*assess-methods*), [5](#)

assess, OC2c-method, [2](#)

assess, OC2c-method
(*assess-methods*), [5](#)

assess-methods, [5](#)

OC2c, [2](#), [3](#), [3](#), [5](#)

OC2c-class, [4](#)

OC2c-class, [1](#)

OCbinomial-class (*OC2c-class*), [1](#)

OChypergeom-class (*OC2c-class*), [1](#)

OCpoisson-class (*OC2c-class*), [1](#)

plot, numeric, OCbinomial-method
(*OC2c*), [3](#)

plot, numeric, OChypergeom-method
(*OC2c*), [3](#)

plot, numeric, OCpoisson-method
(*OC2c*), [3](#)

plot, OC2c-method (*OC2c*), [3](#)

plot, OCbinomial, missing-method
(*OC2c*), [3](#)

plot, OChypergeom, missing-method
(*OC2c*), [3](#)

plot, OCpoisson, missing-method
(*OC2c*), [3](#)

show, OC2c-method (*OC2c*), [3](#)

show, OChypergeom-method (*OC2c*), [3](#)

summary, OC2c-method (*OC2c*), [3](#)

summary, OChypergeom-method
(*OC2c*), [3](#)