Package 'Dodge'

October 12, 2022

Type Package

Title Acceptance Sampling Ideas Originated by H.F. Dodge

Version 0.9-2

Date 2018-06-29

Author A. Jonathan R. Godfrey [aut, cre],
K. Govindaraju [aut]

Maintainer A. Jonathan R. Godfrey <a.j.godfrey@massey.ac.nz>

Description A variety of sampling plans are able to be compared using evaluations of their operating characteristics (OC), average outgoing quality (OQ), average total inspection (ATI) etc.

License GPL

LazyLoad yes

Depends R (>= 2.14.0)

URL https://github.com/ajrgodfrey/Dodge

BugReports https://github.com/ajrgodfrey/Dodge/issues

RoxygenNote 6.0.1

NeedsCompilation no

Repository CRAN

Date/Publication 2018-06-05 05:25:51 UTC

R topics documented:

`Dodge-package` *Acceptance sampling functions*

Description

A number of sampling plans can be compared for their operating characteristics and other commonly used functions.

Details

Package:	Dodge
Type:	Package
Version:	0.9-2
Date:	2018-06-29
License:	GPL
LazyLoad:	yes

Author(s)

Raj Govindaraju and Jonathan Godfrey

Maintainer: A. Jonathan R. Godfrey <a.j.godfrey@massey.ac.nz>

References

Dodge

`ChainBinomial` *Chain Sampling Plans*

Description

Chain Sampling Plans for the binomial and Poisson distributions.

Usage

```
ChainBinomial(N, n, i, p = seq(0, 0.2, 0.001), Plots = TRUE)
```

Arguments

N	the lot size
n	the sample size
i	the number of preceding lots that are free from nonconforming units for the lot to be accepted
p	a vector of values for the possible fraction of product that is nonconforming
Plots	logical to request generation of the four plots

Value

A matrix containing the argument p as supplied and the calculated OC, ATI and ???

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

References

Dodge, H.F. (1955) "Chain Sampling Inspection Plan", *Industrial Quality Control* **11**(4), pp10-13.

Examples

```
require(Dodge)
ChainBinomial(1000, 20,3)
ChainPoisson(1000, 20,3)
```

CurtBinomial *Curtailed Average Sample Number*

Description

Computes the average sample number for a curtailed inspection plan for single sampling plans. Functionality is currently available for only the binomial distribution.

Usage

```
CurtBinomial(n, Ac, p = seq(0, 0.5, 0.01), Plots = TRUE)
```

Arguments

n	the sample size (potential)
Ac	the acceptance number
p	a vector of values for the possible fraction of product that is nonconforming
Plots	logical to request generation of the four plots

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

Examples

```
CurtBinomial(20,1)
```

`DSPlanBinomial` *Double Sampling Plans*

Description

Double Sampling Plans for the binomial and Poisson distributions.

Usage

```
DSPlanBinomial(N, n1, n2, Ac1, Re1, Ac2, p = seq(0, 0.25, 0.005),
  Plots = TRUE)
```

Arguments

`N`	the lot size
`n1`	the sample size in the first stage of the plan
`n2`	the sample size in the second stage of the plan
`Ac1`	the first stage acceptance number
`Re1`	the first stage rejection number
`Ac2`	the second stage acceptance number
`p`	a vector of values for the possible fraction of product that is nonconforming
`Plots`	logical to request generation of the four plots

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

References

Dodge, H.F. and Romig, H.G. (1959) "Sampling Inspection Tables, Single and Double Sampling", Second edition, John Wiley and Sons, New York.

Examples

```
DSPlanBinomial(1000, 10, 10, 0, 2, 1)
DSPlanPoisson(1000, 10, 10, 0,2, 1)
```

LSP *Lot Sensitive Compliance Sampling Plans*

Description

The lot sensitive compliance sampling plans for given parameters.

Usage

```
LSP(N, LTPD, beta, p = seq(0, 0.3, 0.001), Plots = TRUE)
```

Arguments

N	the lot size
LTPD	the lot tolerance percent defective, also known as the limiting quality
beta	consumer risk
p	fraction nonconforming
Plots	logical indicating if the four plots are required

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

References

Schilling, E.G. (1978) "A Lot Sensitive Sampling Plan for Compliance Testing and Acceptance Inspection", *Journal of Quality Technology* **10**(2), pp47-51.

Examples

```
LSP(1000, 0.04,0.05)
```

plot.AccSampPlan *plot methods for the Dodge package*

Description

Creates plots for analysing the design of an acceptance sampling procedure.

Usage

```
## S3 method for class 'AccSampPlan'
plot(x, y = NULL, ...)
```

Arguments

x	an object of class AccSampPlan, CurtSampPlan, or SeqSampPlan
y	ignored
...	further arguments passed to or from other methods.

Details

At this stage the `plot.AccSampPlan` method only plots the Operating Characteristic (OC) curve, the Average (AOQ) and (ATI) against the proportion (p) of product that is nonconforming. It also plots the curtailed sample size or the average sample number (ASN) against p. Further development is still required.

Author(s)

Jonathan Godfrey with some assistance from Raj Govindaraju

Examples

```
Plan1 = SSPlanBinomial(1000, 20,1, Plots=FALSE)
plot(Plan1)
```

---

print.AccSampPlan *print methods for the Dodge package*

Description

Adds to the base functionality for the print() command. The accompanying `plot` methods are more sophisticated.

Usage

```
## S3 method for class 'AccSampPlan'
print(x, ...)
```

Arguments

x	an object of class AccSampPlan, CurtSampPlan, or SeqSampPlan
...	further arguments passed to or from other methods.

Details

These methods print the most necessary elements of the corresponding objects.

Author(s)

Jonathan Godfrey

See Also

The corresponding plot method is far more interesting. See `plot.AccSampPlan` for example.

`SeqDesignBinomial` *Create a sequential sampling plan*

Description

Selects the appropriate sequential sampling plan from the given inputs. The only distribution that has been used in functions thus far is the binomial, but further development is expected.

Usage

```
SeqDesignBinomial(N = NULL, AQL, alpha, LQL, beta, Plots = TRUE)
```

Arguments

`N`	the lot size, ignored for the design of the plan unless the underlying distribution is hypergeometric
`AQL`	Acceptable quality level
`alpha`	producer's risk
`LQL`	Limiting quality level
`beta`	consumers' risk
`Plots`	logical stating if the sequential chart should be plotted

Author(s)

Raj Govindaraju and Jonathan Godfrey

`SequentialBinomial` *Attribute Sequential Sampling Plans*

Description

Designs an attribute sequential sampling plan for given AQL, alpha, LQL, and beta. The user can request plots describing the performance of the plan.

Usage

```
SequentialBinomial(x, Plots = TRUE)
```

Arguments

`x`	an object of class SeqSampPlan, or at least having the same elements as one.
`Plots`	logical indicating if the four plots should be returned

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

Examples

```
PlanDesign=SeqDesignBinomial(AQL=0.01, alpha=0.05, LQL=0.04, beta=0.05, Plots=FALSE)
SequentialBinomial(PlanDesign)
```

SSPDesignBinomial *Single Sampling Plan Designs*

Description

Design a single sampling plan for given AQL, alpha, LQL, and beta. Currently there are functions for the binomial and Poisson distributions.

Usage

```
SSPDesignBinomial(AQL, alpha, LQL, beta)
```

Arguments

AQL	Acceptable quality level
alpha	producer's risk
LQL	Limiting quality level
beta	consumers' risk

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

References

Dodge, H.F. and Romig, H.G. (1959) "Sampling Inspection Tables, Single and Double Sampling", Second edition, John Wiley and Sons, New York.

Examples

```
SSPDesignBinomial(0.01, 0.05, 0.04, 0.05)
SSPDesignPoisson(0.01, 0.05, 0.04, 0.05)
```

SSPlanBinomial *Single Sampling Plans*

Description

Single sampling plans for the binomial, hypergeometric and Poisson distributions.

Usage

```
SSPlanBinomial(N, n, Ac, p = seq(0, 0.3, 0.001), Plots = TRUE)
```

Arguments

N	the lot size
n	the sample size
Ac	the acceptance number, being the maximum allowable number of non-conforming units or non-conformities
p	a vector of values for the possible fraction of product that is non-conforming
Plots	logical to request generation of the four plots

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

References

Dodge, H.F. and Romig, H.G. (1959) "Sampling Inspection Tables, Single and Double Sampling", Second edition, John Wiley and Sons, New York.

Examples

```
SSPlanBinomial(1000, 20,1)
SSPlanHyper(5000, 200,3)
SSPlanPoisson(1000, 20,1)
```

VSPDesign *Variable Sampling Plan Design*

Description

Design the variable sampling plan for given AQL, alpha, LQL, and beta.

Usage

```
VSPDesign(AQL, alpha, LQL, beta)
```

Arguments

AQL	Acceptable quality level
alpha	producer's risk
LQL	Limiting quality level
beta	consumers' risk

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

Examples

```
VSPDesign(AQL=0.01, alpha=0.05, LQL=0.04, beta=0.05)
```

VSPKnown *Variable Sampling Plans*

Description

Variable sampling plans for known and unknown sigma, evaluated for given parameters.

Usage

```
VSPKnown(N, n, k, Pa = seq(0, 1, 0.001), Plots = TRUE)
```

Arguments

N	the lot size
n	the sample size
k	the acceptability constant
Pa	fraction nonconforming
Plots	logical indicating whether the four plots are required

Author(s)

Raj Govindaraju with minor editing by Jonathan Godfrey

Examples

```
VSPKnown(1000, 20,1)
VSPUnknown(1000, 20,1)
```

Index