Package 'Planesmuestra'

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Type Package

Title Functions for Calculating Dodge Romig, MIL STD 105E and MIL STD 414 Acceptance Sampling Plan

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Description Calculates an acceptance sampling plan, (sample size and acceptance number) based in MIL STD 105E, Dodge Romig and MIL STD 414 tables and procedures. The arguments for each function are related to lot size, inspection level and quality level. The specific plan operating curve (OC), is calculated by the binomial distribution.

License GPL (>= 2)

LazyData TRUE

Imports stats, graphics, utils

NeedsCompilation no

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`Planesmuestra-package` *Acceptance sampling plan according the Dodge Romig, MIL STD105E and MIL STD414 plans.*

Description

Use a funcion for each plan and a special one for graphic an OC curve. The plan functions are bassed in the Dodge Romig, MIL STD 105E and MIL STD 414. However, the OC curve is calculated using the binomial trials, after calculating acceptance sampling plan.

Details

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Author(s)

Erick Marroquin
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`ap_DR` *Data: Dodge Romig table of Nonconforming fraction levels for AOQL and LPTD plans*

Description

Contains the different maximum non conforming fractions of AQL and LTPD plan, according Dodge Romig plans. A data frame with six maximum levels of the nonconforming fraction for each AOQL and LPTD plan.

Usage

```
data("ap_DR")
```

Format

A data frame with 6 observations on the following 2 plans.

`AOQL` a numeric vector containing the nonconforming fraction level for AOQL plan

`LPTD` a numeric vector containing the nonconforming fraction level for LPTD plan

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(ap_DR)
```

`code_letter` *Data: Inspection level and the code letter for a MIL STD 105E acceptance sampling plan.*

Description

Contains the unique code letter for a specific size lot, interpolated through the f_milstd105E function, and specificl normal or special inspection level.

Usage

```
data("code_letter")
```

Format

A data frame with 0 observations on the following 2 variables.

`S.1` a character vector with the code letters, for the S.1 special inspection level

`S.2` a character vector with the code letters, for the S.2 special inspection level

`S.3` a character vector with the code letters, for the S.3 special inspection level

`S.4` a character vector with the code letters, for the S.4 special inspection level

`I` a character vector with the code letters, for the I normal inspection level

`II` a character vector with the code letters, for the II normal inspection level

`III` a character vector with the code letters, for the III normal inspection level

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(code_letter)
```

`code_letter.milstd414` *Data: Inspection level and the code letter for a MIL STD 414 acceptance sampling plan and normal inspection.*

Description

Contains the unique code letter for a specific size lot, interpolated through the f_milstd105E function, and specificl normal or special inspection level.

Usage

```
data("code_letter.milstd414")
```

Format

A data frame with 0 observations on the following 2 variables.

`I` a character vector with the code letters, for the I inspection level

`II` a character vector with the code letters, for the II inspection level

`III` a character vector with the code letters, for the III inspection level

`IV` a character vector with the code letters, for the IV inspection level

`V` a character vector with the code letters, for the V inspection level

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(code_letter.milstd414)
```

f_CO.NCA.NCL *OC Curve for AOQL and LPTD relation*

Description

Given an AOQL, LPTD, sample size and acceptance number, return the plot the OC curve and producer and consumer risk.The calculation uses the binomial trials. Applies for attribute plans.

Usage

```
f_CO.NCA.NCL(NCA,NCL,n,c)
```

Arguments

NCA	Specific AOQL value
NCL	Specific LPTD value
n	sample size
c	acceptance number

Details

Functionn stops if any value is missing

Value

NCA	Specific AOQL value
NCL	Specific LPTD value
n	sample size
c	acceptance number
beta	consumer risk
alpha	producer risk

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

f_dodge.romig.simple, f_milstd414, f_milstd105e, f_CO.plan, f_DR.CO

Examples

```
f_CO.NCA.NCL(NCA=0.02,NCL=0.1,n=69,c=3)
```

`f_CO.plan` *Plot the OC Curve for a specific Dodge Romig acceptance sampling plan results*

Description

Plot the OC Curve for a specific acceptance plan. The function need the plan defined in a previous function. The calculation uses the binomial trials. Applies for attribute plans.

Usage

```
f_CO.plan(plan)
```

Arguments

`plan`	A vector with acceptance number c , the sample size n, and the fraction of the non conforming items p.

Value

`c`	An integer number grater than zero, for the acceptance number.
`n`	An integer number grater than the acceptance number for the sample size.
`p`	Fraction average of the nonconforming items.
`beta`	Acceptance probability.

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

f_dodge.romig.simple, `f_milstd414`, `f_milstd105e`, `f_DR.CO`

Examples

```
r1<-f_dodge.romig.simple(N=2500,"AOQL", p=0.01)
f_CO.plan(r1$plan)
```

`f_dodge.romig.simple` *Calculate the acceptance sampling for Dodge Romig method*

Description

Starting with a known lot N, and a specific AOQL or LPTD plan, and an average of proportion of defectives or nonconforming items, the plan is calculated, giving the sample size, the acceptance number and the rejection number. The function is for simple acceptance sample plans only.

Usage

```
f_dodge.romig.simple(N,plan,p)
```

Arguments

`N`	Is the lot size, an integer number, must be grater than 2
`plan`	A character string for specify the AOQL or LPTD plan
`p`	Fraction average of the nonconforming items

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

`f_DR.CO` `f_milstd414` `f_milstd105e`

Examples

```
f_dodge.romig.simple(N=5000,plan="AOQL",p=0.017)
```

f_DR.CO *Plot the OC Curve for a specific acceptance sampling plan*

Description

Plot the OC Curve for a specific acceptance plan. Needs the acceptance number c , the sample size n, and the fraction of the non conforming items p. The calculation uses the binomial trials. Applies for attribute plans.

Usage

```
f_DR.CO(c,n,p)
```

Arguments

c	An integer number grater than zero, for the acceptance number.
n	An integer number grater than the acceptance number for the sample size.
p	Fraction average of the nonconforming items.

Value

c	An integer number grater than zero, for the acceptance number.
n	An integer number grater than the acceptance number for the sample size.
p	Fraction average of the nonconforming items.
beta	Acceptance probability.

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

f_dodge.romig.simple, f_milstd414, f_milstd105e, f_CO.plan

Examples

```
# n = 125 items, c=2, p =  0.01
f_DR.CO(2,125,0.1)
```

f_milstd105e *Calculate the acceptance sampling for MIL STD 105E / ANSI ASQ C Z 1.4 / ISO 2589 plan*

Description

Given lot size, a type of inspection (Normal, Reduced, Tightened), type of sampling (Simple, double or multiple), and the AQL, show the calculated acceptance plan based in the MIL STD 105e tables. The function is for simple acceptance sample plans only.

Usage

```
f_milstd105e(N,L,NCA,type)
```

Arguments

N	Is the lot size, an integer number, must be grater than 2
L	A character string for inspection level (S-1,S-2,S-3,S-4,I, II, III)
NCA	A numeric value for the AQL
type	A character string whith the type of inspection, - n - normal, - r - reduced, in other case is tightened

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

f_DR.CO f_dodge.romig.simple f_milstd414

Examples

```
## L = 1200 , an AQL = 1, level III, tightened inspection
f_milstd105e(N=11000,L="II",type="n",NCA=15)
```

f_milstd414 *Calculate the acceptance sampling for MIL STD 414 / ANSI ASQ C Z 1.9 / ISO 3951 plan*

Description

Given lot size, an inspection level, a type of inspection and the NCA, show the calculated acceptance plan based in the MIL STD 414 tables.

Usage

```
f_milstd414(N,L,NCA,type)
```

Arguments

N	Is the lot size, an integer number, must be grater than 2
L	A character string for inspection level (I,II,III,IV,V)
NCA	A numeric value for the NCA
type	Type of inspection, - n - normal, - t - tightened

Details

The master table of MIL STD 414 for plans based in variables, contains the values for both type of inspection.

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

f_DR.CO, f_dodge.romig.simple, f_milstd105e , f_milstd414.test

Examples

```
## L = 1200, NCA = 1, level III, tightened inspection
##
f_milstd414(N=1200,NCA=1,L="III",type="t")
```

`f_milstd414.test` *Accept or reject a variable sample considering a shift factor*

Description

Accept or reject a variable sample considering a shift factor, the data comes from an especific variable plan.

Usage

```
f_milstd414.test(x,k,S,Limite,L)
```

Arguments

`x`	Vector or data frame containing the taken sample values, the function evaluates only the first column or variable
`k`	A vector of length one, equal shift factor
`S`	Know standard deviation, if value not exists, function gives the sample standard deviation
`Limite`	A character vector of length one, "S" for upper control limit and "I" for lower control limit
`L`	A vector of length one, equal to a specific Control Limit value

Author(s)

Erick Marroquin

References

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

See Also

`f_milstd414`

Examples

```
x<-c(4.7,5.1,4.9,4.9,4.8,4.9,4.9,4.8,4.8,4.7,4.7,4.9,4.8,4.9,4.6,4.8,4.9,5.1,4.8,5,5,4.7,5,5,4.8)
f_milstd414.test(as.data.frame(x),k=1.98,Limite="S", L=5.1)
f_milstd414.test(as.data.frame(x),k=1.98,Limite="I", L=4.7)
```

k_plans.milstd414 *Data: Extract the sample size and k value for MIL STD 414 variable acceptance sampling plans and normal type.*

Description

Data for indexing sample size and k value, given the code lette, AQL value and inspection type code.

Usage

```
data("k_plans.milstd414")
```

Format

A data frame with 432 observations on the following 5 variables.

`code_letter` a factor for code letters, levels are B, C, D, E, F, G, H, J, K, L, M, N, P, Q

`sample` a numeric vector for sample size

`k` a numeric vector containing the k value

`NCA` a factor containing the different AQL levels

`T` a character vector for normal inspection

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(k_plans.milstd414)
```

lot_size *Data: Lot size levels for MIL STD 105 E acceptance sampling plans*

Description

Interpolate the table lot size level starting from a real lot size

Usage

```
data("lot_size")
```

Format

A data frame with 15 minimum levels for size lot.

N A numeric vector containing the minimun level. For lots greater than 1x10^10, the function fixes the lot size as the last one of the "lot_size" data frame.

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(lot_size)
```

---

lot_size.milstd414 *Data: Lot size levels for MIL STD 414 variable acceptance sampling plans*

Description

Interpolate the table lot size level starting from a real lot size.

Usage

```
data("lot_size.milstd414")
```

Format

A data frame with 17 minimun levels for size lot.

N A numeric vector containing the minimun level. For lots greater than 550001, the function fixes the lot size as the last one of the "lot_size" data frame.

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(lot_size.milstd414)
```

lot_size_DR *Data: Lot size for Dodge Romig acceptance sampling plan*

Description

Shows the results for a given lot size, AOQL or LPTD plan and a fraction of non conforming items. The results are: the acceptance number - n -, the rejection number - c -, and the corresponding AOQL - LPTD percentage.

Usage

```
data("lot_size_DR")
```

Format

A data frame with 222 observations on the following 6 variables.

`N` a numeric vector whith the interpolated lot

`plan` a factor with two levels, the AOQL and the LPTD plan.

`p` a character vector whith six levels, for each AOQL and the LPTD plan.

`n` a numeric vector for the sample size for a specific acceptance plan.

`c` a numeric vector for the acceptance number for a specific acceptance plan.

`LPTD._AOQL` a numeric vector for the LPTD or AOQL index.

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(lot_size_DR)
## maybe str(lot_size_DR) ; plot(lot_size_DR) ...
```

milstd105eplans *Data: Extract the sample size and the acceptance number for MIL STD 105E acceptance sampling plans.*

Description

Data for indexing sample size and acceptance number, given the code lette, AQL value and inspection type code.

Usage

```
data(milstd105eplans)
```

Format

A data frame with 1274 entries on the following 5 variables.

`code_letter` a factor for code letters, levels are A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S

`n` a numeric vector for sample size

`T` a factor for type of inspection, among tightened, reduced or normal, "t", "r", "n" respectively

`NCA` a factor containing the different AQL levels, 26 in total

`c` a numeric vector for acceptance number

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(milstd105eplans)
```

NCA_values *Data: AQL levels for MIL STD 105E acceptance sampling plans.*

Description

Contains the AQL level values for sample size and acceptance number. The row order is the sames as the code letter, previously determined.

Usage

```
data("NCA_values")
```

Format

`NCA_values` a numeric vector containing 26 AQL levels

Source

Montgomery, D.C. (2005) *Introduction to Statistical Quality Control*, 5th ed. New York: John Wiley & Sons, ISBN 0-471-65631-3

Examples

```
data(NCA_values)
## NCA values is the same for AQL values
```

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