

Package ‘optBuck’

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Type Package

Title What the Package Does (Title Case)

Version 0.1.0

Author Who wrote it

Maintainer The package maintainer <yourself@somewhere.net>

Description More about what it does (maybe more than one line)

Use four spaces when indenting paragraphs within the Description.

License What license is it under?

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LazyData true

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BarkFunction

*BarkFunction***Description**

Calculates diameter values under bark

Usage

```
BarkFunction(
  DiameterValue,
  SpeciesGroupKey,
  SpeciesGroupDefinition,
  Top_ob,
  DBH,
  LogLength
)
```

Arguments

DiameterValue	numeric vector of corresponding diameters (mm)
SpeciesGroupKey	Species ID
SpeciesGroupDefinition	List of species group information, with speciesgroupkey as the name of the elements(see getSpeciesGroupDefinition)
Top_ob	Starting position of log along the stem
DBH	in mm, for Skogforsk 2004 barkFunction categories
LogLength	Optional, in cm

Value

Log volume in m3

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

Buck

equal.lengths	<i>equal.lengths</i>
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Description

Test whether vectors are of equal lengths

Usage

```
equal.lengths()
```

Value

error when vector lengths are not equal

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptApt

Examples

```
a=c(1,2);b=c(1,2,3)
equal.lengths(a,b)
```

getBucking	<i>getBucking</i>
------------	-------------------

Description

Extract bucking outcomes from a .hpr file

Usage

```
getBucking(hprfile, PriceMatrices, ProductData, StemProfile)
```

Arguments

hprfile	Path to .hpr file
PriceMatrices	list of prices matrices for all ProductKeys
ProductData	Matrix containing product data (see getProductData)
StemProfile	Stem profiles for all stems in hprfile (see getStemProfile)

Value

Output structure with bucking outcomes

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptBuck, Optbuck_hpr

getHarvestedArea	<i>getHarvestedArea</i>
------------------	-------------------------

Description

Extract harvested area

Usage

```
getHarvestedArea(Stems)
```

Arguments

Stems	output of getStems()
-------	----------------------

Value

Simple feature object of area around harvested trees

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

Examples

```
Stems=getStems(hprfile)
getHarvestedArea(Stems)
```

getLengthClasses	<i>LengthClasses</i>
------------------	----------------------

Description

Extract the length classes for each assortment from .hpr files, needed for volume calculation when VolumeLengthCategory=="Length as defined in LengthClasses"

Usage

```
getLengthClasses(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

List of length classes for assortments, element names correspond to product keys

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

*getLogs**getLogs*

Description

Extract information on harvested logs from .hpr files

Usage

```
getLogs(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

data table with log information

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getPermittedGrades	<i>getPermittedGrades</i>
--------------------	---------------------------

Description

Extract the permitted stem grades for each assortment from .hpr files

Usage

```
getPermittedGrades(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

List of permitted grades for assortments, element names correspond to product keys

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getPriceMatrices	<i>getPriceMatrices</i>
------------------	-------------------------

Description

Extract product data from .hpr files

Usage

```
getPriceMatrices(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

list of prices matrices for all ProductKeys. Element names are productkeys.

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getProductData	<i>getProductData</i>
----------------	-----------------------

Description

Extract product data from .hpr files

Usage

```
getProductData(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

Information on ProductKeys, ProductNames, ProductGroupName, SpeciesGroupKey, DiameterUnderBark, DiameterClassLowerLimit, DiameterClassMAX, LengthClassLowerLimit, LengthClassMAX, VolumeDiameterCategory, DiameterTopPositions

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getSortimentOverview	<i>getSortimentOverview</i>
----------------------	-----------------------------

Description

show figure of distribution of harvested volume over assortments

Usage

```
getSortimentOverview(Logs, ProductData)
```

Arguments

Logs	otput from getLogs
ProductData	output from getProductData

Value

figure in viewer

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

getLogs, getProductData

getSpeciesGroupDefinition
getSpeciesGroupDefinition

Description

Extract information on species groups from .hpr files

Usage

getSpeciesGroupDefinition(hprfile)

Arguments

hprfile Path to input .hpr file

Value

List of species group information, with speciesgroupkey as the name of the elements

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getStemprofile *getStemprofile*

Description

Extract stem profiles from .hpr files

Usage

getStemprofile(hprfile)

Arguments

hprfile Path to input .hpr file

Value

Stem profiles of harvested stems with stem grades

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

getStems

getStems

Description

Extract information on harvested stems from .hpr files

Usage

```
getStems(hprfile)
```

Arguments

hprfile	Path to input .hpr file
---------	-------------------------

Value

data table with stem information

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

optBuck

impute_top	<i>impute_top</i>
------------	-------------------

Description

Impute unused top of stem into result matrix of OptApt (waste)

Usage

```
impute_top(tt)
```

Arguments

tt	matrix of log segments which maximize cumulative value
----	--

Value

new matrix which includes the tree top as waste

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptApt

is.whole	<i>is.whole</i>
----------	-----------------

Description

Test if number(s) is/are whole or decimal

Usage

```
is.whole(a, tol = 1e-07)
```

Arguments

a	A number
tol	Tolerance

Value

Logical: "True" if whole and "False" if decimal

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptApt

Examples

```
a=c(1,2);b=1.2
is.whole(a)
is.whole(b)
```

optBuck	<i>Optimal bucking</i>
---------	------------------------

Description

Optimizes the bucking

Usage

```
hello()
```

Examples

```
optBuck()
```

optBuck_hpr	<i>optBuck_hpr</i>
-------------	--------------------

Description

Calculate optimal bucking for hpr files

Usage

```
optBuck_hpr(
  hprfile,
  PriceMatrices,
  ProductData,
  StemProfile,
  PermittedGrades,
  ...
)
```

Arguments

hprfile	Path to input .hpr file
PriceMatrices	list of price matrices for all ProductKeys (see getPriceMatrices)
ProductData	Matrix containing product data (see getProductData)
StemProfile	Stem profiles for all stems in hprfile (see getStemProfile)
PermittedGrades	list with the same lenght of assortments, each element containing the stemgrades allowed in each assortment (see getPermittedGrades)
...	others

Value

result structure with optimum bucking solution for the stems in the input hpr file

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

References

Skogforsk 2011. Introduction to StanForD 2010. URL: Skogforsk. <https://www.skogforsk.se/contentassets/1a68cdce4af2010-introduction-150826.pdf>

See Also

getPermittedGrades, getPriceMatrices, getProductData

plotBucking

plotBucking

Description

Plot the bucking outcome

Usage

```
plotBucking(diameterPosition, DiameterValue, StemGrade, res)
```

Arguments

diameterPosition	vector of diameter positions (cm) of a stem profile: 0,10,...,end
DiameterValue	vector of corresponding diameters (mm) for those diameter positions
StemGrade	vector of corresponding stem grades
res	the bucome outcome, i.e., output of OptApt()

Value

plot of bucking outcome

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptApt

predictStemprofile	<i>predictStemprofile</i>
--------------------	---------------------------

Description

Predict and extract stem profiles using taper models based on the log dimensions, for cases when no stem profile is recorded in the hpr file.

Usage

```
predictStemprofile(hprfile, ProductData, PermittedGrades)
```

Arguments

hprfile	Path to .hpr file
ProductData	output of getProductData()
PermittedGrades	output of getPermittedGrades()

Value

Output structure with stem profile containing stem grades

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

PriceVolumeCalc	<i>PriceVolumeCalc</i>
-----------------	------------------------

Description

Calculates log price volume, i.e., the volume which is used for price calculation

Usage

```
PriceVolumeCalc(
  VolumeDiameterAdjustment,
  VolumeDiameterCategory,
  VolumeLengthCategory,
  diameterPosition,
  DiameterValue,
  StartPos,
  StopPos,
  DiameterTopPosition,
  DiameterUnderBark = T,
  SpeciesGroupKey = NA,
  SpeciesGroupDefinition = NA,
  DBH = NA,
```

```

    LogLength = NA,
    LengthClasses = NA,
    ProductKey = NA
  )

```

Arguments

VolumeDiameterAdjustment
Volume diameter adjustment according to stanford2010 (see `getProductData()`).

VolumeDiameterCategory
Volume calculation method according to stanford2010 (see `getProductData()`).

VolumeLengthCategory
Volume length category according to stanford2010 (see `getProductData()`).

diameterPosition
numeric vector of diameter positions (cm) of a stem profile; 0,10,...,end

DiameterValue numeric vector of corresponding diameters (mm)

StartPos Starting position of log along the stem

StopPos Ending position of log

DiameterTopPosition
Position from top end of log where top diameter is measured. Cm

DiameterUnderBark
Logical TRUE/FALSE

SpeciesGroupKey
Species ID

SpeciesGroupDefinition
List of species group information, with speciesgroupkey as the name of the elements(see `getSpeciesGroupDefinition`)

DBH Optional, in mm (see `BarkFunction`)

LogLength Optional, in cm (see `BarkFunction`)

LengthClasses List of length classes for the assortments (see `getLengthClasses`)

ProductKey Assortment key (see `getProductData()`)

Value

Log volume in m3

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

Buck

StemprofileIncrement *StemprofileIncrement*

Description

Predict Stemprofile at another point in time given a vector of new DBHs

Usage

```
StemprofileIncrement(Stemprofile, DBH2, breastheight)
```

Arguments

Stemprofile	Stem profiles for all stems in hprfile (see <code>getStemProfile</code>)
DBH2	a numeric vector of new DBHs, of the same length as unique StemKeys in Stemprofile
breastheight	height in cm which is considered breastheight (numeric), typically 110 or 130.

Value

A new Stemprofile object in which the new diameters are added

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

strsplits *strsplits*

Description

modified strsplit for multiple splits

Usage

```
strsplits(x, splits)
```

Arguments

x	character vector to split
splits	vector of character patterns used to split

Value

List of permitted grades for assortments

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

getPriceMatrices

track_trace	<i>track_trace</i>
-------------	--------------------

Description

Back-track optimum bucking solution

Usage

track_trace(m, tt)

Arguments

- m matrix of potential cuts
- tt matrix of log segment which maximize cumulative value

Value

Logical: "True" if whole and "False" if decimal

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

OptApt

VolumeCalc	<i>VolumeCalc</i>
------------	-------------------

Description

Calculates log volume from all diameters as solid volume

Usage

```
VolumeCalc(  
  diameterPosition,  
  DiameterValue,  
  StartPos,  
  StopPos,  
  DiameterTopPosition,  
  DiameterUnderBark = T,  
  SpeciesGroupKey = NA,  
  SpeciesGroupDefinition = NA,  
  DBH = NA,  
  LogLength = NA  
)
```


Arguments

diameterPosition	numeric vector of diameter positions (cm) of a stem profile; 0,10,...,end
DiameterValue	numeric vector of corresponding diameters (mm)
StartPos	Starting position of log along the stem
StopPos	Ending position of log
DiameterTopPosition	Position from top end of log where top diameter is measured. Cm
DiameterUnderBark	Logical TRUE/FALSE
SpeciesGroupKey	Species ID
SpeciesGroupDefinition	List of species group information, with speciesgroupkey as the name of the elements(see getSpeciesGroupDefinition)
DBH	Optional, in mm (see BarkFunction)
LogLength	Optional, in cm (see BarkFunction)

Value

Log volume in m3

Author(s)

Lennart Noordermeer <lennart.noordermeer@nmbu.no>

See Also

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