

Package ‘dimensionalAnalysis’

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Type Package

Title Dimensional Analysis

Version 0.1.0

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Depends R (>= 3.5.0)

Imports caracas, hash, reticulate

Description Performs Rayleigh's method of dimensional analysis.
This form of dimensional analysis expresses a functional relationship of some variables in the form of an exponential equation (Buckingham, (1914), <doi:10.1103/PhysRev.4.345>).

Config/reticulate list(packages = list(list(package = ``sympy")))

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Encoding UTF-8

RoxygenNote 7.1.1

NeedsCompilation no

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daSolve

Rayleigh's Method of Dimensional Analysis

Description

Performs Rayleigh's method of dimensional analysis

Usage

```
daSolve(dv, iv)
```

Arguments

dv	dependent variable
iv	independent variables

Details

The study of the relationship between physical quantities with the help of dimensions and units of measurement is termed as dimensional analysis. Dimensional analysis is essential because it keeps the units the same, helping us perform mathematical calculations smoothly. Dimensional Analysis (also called Factor-Label Method or the Unit Factor Method) is a problem-solving method that uses the fact that any number or expression can be multiplied by one without changing its value.

Rayleigh's method of dimensional analysis is a conceptual tool used in physics, chemistry, and engineering. This form of dimensional analysis expresses a functional relationship of some variables in the form of an exponential equation. It was named after Lord Rayleigh.

Here are the types and variables:

Type

Geometric

Kinematic

Dynamic

'length', 'area',
'time', 'linear velocity', 'angular velocity', 'velocity', 'frequency', 'lin
'mass', 'force', 'weight', 'density', 'specific weight', 'specific gravity', 'pressure', 'stress', 'shear stress', 'strain',

Value

fundamental dimensions (MLT equations) and the solution

Examples

```
## Not run:
## Example 1:
daSolve(dv = "force",
        iv = c("mass", "velocity", "length"))

## Example 2
daSolve(dv = "force",
```

```
iv = c("velocity", "diameter",  
       "density", "viscosity")  
  
## End(Not run)
```

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