Package 'binpackr'

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Title Fast 1d Bin Packing

Version 0.2.0

Description Implements the First Fit Decreasing algorithm to achieve one dimensional heuristic bin packing. Runtime is of order O(n log(n)) where n is the number of items to pack. See ``The Art of Computer Programming Vol. 1'' by Donald E. Knuth (1997, ISBN: 0201896834) for more details.

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.3.3

LinkingTo cpp11

Suggests testthat (>= 3.0.0), hedgehog (>= 0.1), BBmisc (>= 1.13)

Config/testthat/edition 3

URL https://github.com/lschneiderbauer/binpackr, https://lschneiderbauer.github.io/binpackr/

BugReports https://github.com/lschneiderbauer/binpackr/issues

NeedsCompilation yes

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Repository CRAN

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Description

1D bin packing "First Fit (Decreasing)" algorithm

Usage

```
bin_pack_ffd(x, cap, sort = TRUE)
```

Arguments

x	[numeric()] A numeric vector of item sizes to be fit into bins. Each value represents the size of an atomic item. If a value is NA it is ignored and the corresponding result will also be NA.
cap	[numeric(1)] A scalar value representing the bin capacity in units of values in x. If an individual item size is above cap a single bin is reserved for this item.
sort	[logical(1)] Determines whether the input vector should be sorted in decreasing order before applying the "First Fit" algorithm ("First Fit Decreasing").

Details

See Wikipedia for a concise introduction or "The Art of Computer Programming Vol. 1" by Donald E. Knuth (1997, ISBN: 0201896834) for more details.

Value

[integer()] An integer vector of labels of the same length as x. The integer label at position i determines the assignment of the ith item with size x[i] to a bin. If the value x[i] is NA the result label at position i will also be NA.

Examples

```
# Generate a vector of item sizes
x <- sample(100, 1000, replace = TRUE)

# Pack those items into bins of capacity 130
bins <- bin_pack_ffd(x, cap = 130)

# Number of bins needed to pack the items
print(length(unique(bins)))
```

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