Package ‘quadsum815’

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Type Package

Title Various R and Rcpp Implementations of a Quadratic Sum

Version 1.0

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Description This package is in fulfillment of the requirements of Homework 00 for BIOSTAT 815. quadsum815 provides
five different implementations of functions to compute a single scalar value of the quadratic sum x'Ay. The functions
are as follows: (1) quadsumR: A loop-based R implementation, (2) quadsumS: A loop-free R implementation, (3) quadsumT:
A matrix-based R implementation, (4) quadsumC: A loop-based Rcpp implementation, and (5) quadsumB: A blockwise
loop-based Rcpp implementation.

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Encoding UTF-8

LazyData true

Imports Rcpp (>= 0.12.18)

LinkingTo Rcpp

RoxygenNote 6.1.0

NeedsCompilation yes

Archs i386, x64

R topics documented:

`quadsumB` *A blockwise loop-based Rcpp implementation for computing $x'Ay$*

Description

This function computes $x'Ay$ using blockwise nested loop using Rcpp

Usage

```
quadsumB(x, y, A, blkSize)
```

Arguments

`x`	A size n vector
`y`	A size m vector
`A`	A size (nxm) matrix
`blkSize`	The size of blocks (in #rows or #cols) in calculating $x'Ay$

Value

A scalar value evaluating $x'Ay$

Examples

```
quadsumB(rep(1,100),rep(1,100),matrix(1,100,100), 100)  # [1] 10000
```

`quadsumC` *A loop-based Rcpp implementation for computing $x'Ay$*

Description

A loop-based Rcpp implementation for computing $x'Ay$

Usage

```
quadsumC(x, y, A)
```

Arguments

`x`	A size n vector
`y`	A size m vector
`A`	A size (nxm) matrix

Value

A scalar value evaluating $x'Ay$

Examples

```
quadsumC(rep(1,100),rep(1,100),matrix(1,100,100))  # [1] 10000
```

`quadsumR` *A loop-based R implementation for computing $x'Ay$*

Description

A loop-based R implementation for computing $x'Ay$

Usage

```
quadsumR(x, y, A)
```

Arguments

`x`	A size n vector
`y`	A size m vector
`A`	A size (nxm) matrix

Value

A scalar value evaluating $x'Ay$

Examples

```
quadsumR(rep(1,100),rep(1,100),matrix(1,100,100))  # [1] 10000
```

`quadsumS` *A loop-free R implementation for computing $x'Ay$*

Description

A loop-free R implementation for computing $x'Ay$

Usage

```
quadsumS(x, y, A)
```

Arguments

`x`	A size n vector
`y`	A size m vector
`A`	A size (nxm) matrix

Value

A scalar value evaluating $x'Ay$

Examples

```
quadsumS(rep(1,100),rep(1,100),matrix(1,100,100))  # [1] 10000
```

quadsumT *A matrix-based R implementation for computing $x'Ay$*

Description

A matrix-based R implementation for computing $x'Ay$

Usage

```
quadsumT(x, y, A)
```

Arguments

x	A size n vector
y	A size m vector
A	A size (nxm) matrix

Value

A scalar value evaluating $x'Ay$

Examples

```
quadsumT(rep(1,100),rep(1,100),matrix(1,100,100))  # [1] 10000
```

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