# Package 'otinference'

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**Type** Package

**Title** Inference for Optimal Transport

**Version** 0.1.0

**Imports** MASS (>= 7.3-45), Rglpk (>= 0.6-2), sm (>= 2.2-5.4), transport (>= 0.8-1)

**Suggests** Rcplex (>= 0.3.3)

**Description** Sample from the limiting distributions of empirical Wasserstein distances under the null hypothesis and under the alternative. Perform a two-sample test on multivariate data using these limiting distributions and binning.

**License** GPL-2

**Encoding** UTF-8

**RoxygenNote** 5.0.1

**NeedsCompilation** no

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**Repository** CRAN

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## R topics documented:

## binWDTest *Two-sample test for multivariate data based on binning.*

### Description

Two-sample test for multivariate data based on binning.

### Usage

```
binWDTest(x, y, L = 5, B = 100)
```

### Arguments

| | |
|---|---|
| x, y | The two samples, rows are realizations. |
| L | Number of bins in each dimension. |
| B | Number of realizations of limiting distribution to simulate. |

### Value

p-value.

### Examples

```
## Not run:
x <- MASS::mvrnorm(n = 100, mean = c(0, 0), Sigma = diag(1, 2))
y <- MASS::mvrnorm(n = 100, mean = c(0, 0), Sigma = diag(2, 2))
pVal <- binWDTest(x, y)
## End(Not run)
```

## limDisAlt *Sample from the limit distribution under the alternative.*

### Description

Sample from the limit distribution under the alternative.

### Usage

```
limDisAlt(B = 1000, r, s, distMat, p = 1)
```

### Arguments

| | |
|---|---|
| B | Number of samples to generate. |
| r, s | Number of counts giving the two samples. |
| distMat | Distance matrix. |
| p | Cost exponent. Defaults to 1. |

### Value

A vector of samples.

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`limDisAltBoot` *m-out-of-n Bootstrap for the limiting distribution.*

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### Description

m-out-of-n Bootstrap for the limiting distribution.

### Usage

```
limDisAltBoot(r, s, distMat, B = 1000, p = 1, gamma = 0.9)
```

### Arguments

| | |
|---|---|
| `r, s` | Vectors of counts giving the two samples. |
| `distMat` | Distance matrix. |
| `B` | The number of samples to generate. Defaults to 1000. |
| `p` | Cost exponent. Defaults to 1. |
| `gamma` | m = n^gamma. Defaults to 0.9. |

### Value

A sample from the limiting distribution.

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`limDisNull` *Sample from the limiting distribution under the null.*

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### Description

Sample from the limiting distribution under the null.

### Usage

```
limDisNull(B = 500, r, distMat, p = 1)
```

### Arguments

| | |
|---|---|
| `B` | number of samples to generate. Defaults to 500. |
| `r` | vector of probabilities in the original problem. |
| `distMat` | distance matrix in the original problem. |
| `p` | cost exponent. Defaults to 1. |

### Value

A vector of samples.

`limDisNullGrid` *Sample from the limiting distribution under the null when the underlying space is a grid.*

## Description

Sample from the limiting distribution under the null when the underlying space is a grid.

## Usage

```
limDisNullGrid(B = 500, r, p = 1)
```

## Arguments

| | |
|---|---|
| `B` | Number of bootstrap samples to generate. Defaults to 500. |
| `r` | vector of probabilities in the original problem. Is interpreted as a square matrix. |
| `p` | cost exponent. |

## Value

A vector of samples.

`wassDist` *Compute the Wasserstein distance between to finite distributions.*

## Description

Compute the Wasserstein distance between to finite distributions.

## Usage

```
wassDist(a, b, distMat, p = 1)
```

## Arguments

| | |
|---|---|
| `a, b` | Vectors representing probability distributions. |
| `distMat` | Cost matrix. |
| `p` | cost exponent. |

## Value

The Wasserstein distance.

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