# Package 'fastrerandomize'

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**Title** fastrerandomize: R Package for Ultra Fast Re-randomization Using a JAX Backend

**Version** 0.1

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**Description** An R Package for Ultra Fast Re-randomization Using a JAX Backend

**Depends** R (>= 3.3.3)

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**Encoding** UTF-8

**LazyData** false

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**Imports** reticulate

**RoxygenNote** 7.2.3

## R topics documented:

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| GenerateCausalData | *This function generates simulated causal data based on specified parameters.* |
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### Description

This function generates simulated causal data based on specified parameters.

### Usage

```
GenerateCausalData(n_units)
```

## Arguments

| | |
|---|---|
| n_units | A numeric value specifying the total number of units in the sample. |
| proportion_treated | |
| | A numeric value between 0 and 1 indicating the proportion of units that receive treatment. |
| k_covars | A numeric value indicating the number of covariates to be generated. |
| rho | A numeric value representing the correlation coefficient. |
| SD_inherent | A numeric value indicating the standard deviation inherent to the data. |
| treatment_effect_mean | |
| | A numeric value representing the mean of the treatment effect. |
| treatment_effect_SD | |
| | A numeric value indicating the standard deviation of the treatment effect. |
| covariates_SD | A numeric value or vector specifying the standard deviation of the covariates. |
| Y0_coefficients | |
| | An optional numeric vector specifying the coefficients for the control outcome model. If not provided, the function assumes a NULL value. |
| Y1_coefficients | |
| | An optional numeric vector specifying the coefficients for the treated outcome model. If not provided, the function assumes a NULL value. |

## Value

A list consiting of

- pval A p-value.

## References

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## Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization
```

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| InitializeJAX | *Initialize JAX* |
|---|---|

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## Description

Initialize JAX

## Usage

```
InitializeJax(conda_env, conda_env_required)
```

## Arguments

conda_env   A character string representing the conda environment to activate. A version of JAX should live in that environment.

conda_env_required

     A logical representing whether to force use the specified conda environment.

## Value

This function initializes a JAX-containing conda environment as specified by conda_env. This function must be run before any others in `fastrerandomize`.

## Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization-software
```

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 InitializeJAXFxns   *Initialize JAX functions*

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## Description

Initialize JAX functions

## Usage

```
InitializeJAXFxns()
```

## Arguments

...     This function takes no arguments

## Value

This function should be run just after `fastrerandomize::InitializeJax`.This sets up the internal JAX functions for rerandomization analysis.

## Examples

```
# For tutorials, see
# github.com/cjerzak/fastrerandomization-software
```

| RandomizationTest | *Fast randomization test* |
|---|---|

## Description

Fast randomization test

## Usage

```
RandomizationTest(X, ...)
```

## Arguments

| | |
|---|---|
| obsW | A numeric vector where 0's correspond to control units and 1's to treated units. |
| obsY | An optional numeric vector of observed outcomes. If not provided, the function assumes a NULL value. |
| X | A numeric matrix of covariates. |
| alpha | The significance level for the test. Default is 0.05. |
| candidate_randomizations | |
| | A numeric matrix of candidate randomizations. |
| candidate_randomizations_array | |
| | An optional JAX array of candidate randomizations. If not provided, the function coerces candidate_randomizations into a JAX array. |
| n0_array | An optional array specifying the number of control units. |
| n1_array | An optional array specifying the number of treated units. |
| prior_treatment_effect_mean | |
| | An optional numeric value for the prior mean of the treatment effect. Default is NULL. |
| prior_treatment_effect_SD | |
| | An optional numeric value for the prior standard deviation of the treatment effect. Default is NULL. |
| true_treatment_effect | |
| | An optional numeric value specifying the true treatment effect. Default is NULL. |
| simulate | A logical value indicating whether to run RandomizationTest in simulation mode. Default is FALSE. |
| coef_prior | An optional function generating coefficients on values of X for predicting Y(0). |
| nSimulate_obsW | A numeric value specifying the number of simulated values for obsW. Default is 50L. |
| nSimulate_obsY | A numeric value specifying the number of simulated values for obsY. Default is 50L. |
| randomization_accept_prob | |
| | An numeric scalar or vector of probabilities for accepting each randomization. |
| findFI | A logical value indicating whether to find the fiducial interval. Default is FALSE. |
| c_initial | A numeric value representing the initial criterion for the randomization. Default is 2. |

## Value

A list consisting of

- `p_value` A numeric value or vector representing the p-value of the test (or the expected p-value under the prior structure specified in the function inputs).
- `FI` A numeric vector representing the fiducial interval if `findFI=T`.
- `tau_obs` A numeric value or vector representing the estimated treatment effect(s)

## References

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## Examples

```
# For a tutorial, see
# github.com/cjerzak/fastrerandomization-software
```

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