Package ‘RDieHarder’

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Title R Interface to the ‘DieHarder’ RNG Test Suite

Description The RDieHarder package provides an R interface to
the dieharder suite of random number generators and tests that
was developed by Robert G. Brown and David Bauer, extending
earlier work by George Marsaglia and others.

Depends R (>= 2.5.0)

SystemRequirements DieHarder library (>= 3.31.1) from
<http://www.phy.duke.edu/~rgb/General/dieharder.php>, GNU GSL
for the GSL random-number generators

OS_type unix

License GPL (>= 2)

URL https://github.com/eddelbuettel/rdieharder

NeedsCompilation yes

Repository CRAN

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Description

The random package provides an interface to the dieharder suite of random number generators.

Usage

```r
## Default S3 method:
dieharder(rng="mt19937", test="diehard_runs", psamples=100,
          seed=0, verbose=FALSE, inputfile="", ntuple=5)

## S3 method for class 'dieharder'
print(x, ...)
## S3 method for class 'dieharder'
summary(object, ...)
## S3 method for class 'dieharder'
plot(x, ...)
dieharderGenerators()
dieharderTests()
```

Arguments

- `rng` Either a single character vector, or an integer index, selecting a random-number generator to be tested.
- `test` Either a single character vector, or an integer index, selecting a dieharder test to be used.
- `psamples` An integer for the number of probability values samples underlying the main Kolomogorov-Smirnov test.
- `seed` An integer seed that is to be used for the dieharder rng; if 0, a new random seed is generated.
- `verbose` A switch selecting verbose or silent operation.
- `inputfile` File to read rng draws from for the file_input and file_input_raw generators.
- `ntuple` A integer selecting the ntuple length for tests on short bit strings that permit varying length such as RGB bitdist.
- `x` A dieharder object.
- `object` A dieharder object.
- `...` Other arguments passed on.


**Details**

The current list of generators can be generated dynamically using the `dieharderGenerators()` function. Entries with id below 200 are from the GNU Scientific Library, entries with id greater or equal to 200 and less than 400 are from Dieharder itself, entries with id greater or equal to 400 and less than 500 are from GNU R, entries with id greater or equal to 500 and less than 600 are hardware-based (which is system-dependent), and entries with id greater or equal to 600 are user-contributed.

The current list of tests can be generated dynamically using the `dieharderTests()` function.

**Value**

An object of class `dieharder`, which inherits from the class `htest` commonly used for test statistics is returned. It contains the members:

- `p.value` for the (Kuiper variant) of the Kolmogorov-Smirnov test of the null of a uniform distribution of test values generated by `psamples` tests of `test` using draws from `rng`
- `data` the vector of test statistics used for the Kolmogorov-Smirnov test
- `method` the test method as returned by the `dieharder` library
- `data.name` a character vector describing the data
- `generator` a text description of the generator as returned by the `dieharder` library

**Author(s)**

Dirk Eddelbuettel <edd@debian.org> for the R interface and the port of the R RNGs to DieHarder; Robert G. Brown for everything else in dieharder.

**References**


**Examples**

```r
# Need to set this for the example to pass the R CMD check test
dieharder.generators <- dieharderGenerators()
dh <- dieharder(4, 15, seed=12345) # randu and diehard_runs
summary(dh)
plot(dh)
```
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