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. The 'DieHarder'
library code is included.
Depends R (>= 2.5.0)
SystemRequirements GNU GSL for the GSL random-number generators
License GPL (>= 2)
URL https://github.com/eddelbuettel/rdieharder
BugReports https://github.com/eddelbuettel/rdieharder/issues
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)
```

```r
## S3 method for class 'dieharder'
print(x, ...)
```

```r
## S3 method for class 'dieharder'
summary(object, ...)
```

```r
## S3 method for class 'dieharder'
plot(x, ...)
```

```r
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

The dieharder source code and website.

Examples

```r
## need to set this for the example to pass the R CMD check test
.dieharder.generators <<- dieharderGenerators()

dh <- dieharder(41, 15, seed=12345) # randu and diehard_runs
dh
summary(dh)
plot(dh)
```
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