# Package 'ICapp'

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**Type** Package

**Title** What the Package Does (Title Case)

**Version** 0.1.0

**Author** Who wrote it

**Maintainer** The package maintainer <yourself@somewhere.net>

**Description** More about what it does (maybe more than one line)
Use four spaces when indenting paragraphs within the Description.

**License** What license is it under?

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.1.0.9000

## R topics documented:

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ICSchedule                  *Generates interval-censored Failure Time data with schedule visits*

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### Description

Generates interval-censored Failure Time data with schedule visits. The failure time follows the
Weibull regression model

### Usage

```
ICSchedule(n, shape, scale, visits, p, X = as.matrix(0),
  beta = as.matrix(0))
```

## Arguments

| | |
|---|---|
| n | number of observations to be generated |
| shape | the first parameter of Weibull distribution |
| scale | the second parameter of Weibull distribution |
| visits | the vector with the time of visits |
| p | the probability of a observation fail each visit |
| X | the vector with the values of covariates. The number of rows of X must be equal n |
| beta | the vector with the value of the regression coefficients. The lenght of beta must be equal n |

## Details

First the function generates the failure time using [rweibull()]. The shape is the same and the second parameter is lambda. Lambda is equal to:

$$lambda = scale * exp(X * beta)$$

If there is no value to X and beta $lambda = scale$. Then is generated from the function [rbinom()] for each observation to know what visits really happened. Then is created the vector with the result. If the failure time is greater than the maximum of the visited time the, the first time of that observation is the maximum of the time visited, the second time is [Inf] and the failure time is right-censored. If the failure time less than the minimum of the visited times, the first time of that observation is [-Inf], the second time is the minimum of the visited time and the failured time is left-censored. Orthewise the failure time is between two visited times, than the first time and second time are these visited times and the failure is interval-censored.

## Value

The function return a data.frame on what:

| | |
|---|---|
| L | the first time of the interval generated |
| R | the second time of the interval generated |
| event | the indicator of interval censored data in the same way that is used in [Surv()] function from survival package. |
| X | the value of the covariates |

## Examples

```
ICSchedule(n = 50, shape = 2, scale = 2, visits = c(1,2,3,4), p = 0.1)
```

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| ICSimple | *Generates Case II interval-Censored Failure Time data* |

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### Description

The `ICSimple` generates case II interval-censored failure time data. The failure time follows the Weibull regression model

### Usage

```
ICSimple(n, shape, scale, pc, h, X = as.matrix(0), beta = as.matrix(0))
```

### Arguments

| | |
|---|---|
| n | number of observations to be generated |
| shape | the first parameter of Weibull distribution |
| scale | the second parameter of Weibull distribution |
| pc | the proportion of right-censored expected in the sample |
| h | the maximum of time between the intervals |
| X | the vector with the values of covariates. The number of rows of X must be equal n |
| beta | the vector with the value of the regression coefficients. The lenght of beta must be equal n |

### Details

First the function generates the failure time using [rweibull()]. The `shape` is the same and the second parameter is lambda. Lambda is equal to:

$$lambda = scale * exp(X * beta)$$

If there is no value to X and beta $lambda = scale$ Then the function generates the quantiles, the final time of each observattion. If the failure time is greater than the final time, the time is right-censored. The final time is generated using [qweibull()] with `shape` and lambda. The probability is $1 - pc$. That way, is expected that proportion of right-censored observation be `pc`. Now is generated the time of visits, they are generated using the function [runif(0,2*h)]. They are generated while the time of visits are less than the minimum of the failure time and the final time. Then is selected first and second time interval of each observation. If the failure time is greater than final time, the first time of the interval is the bigger time of visit and the second time is [Inf]. If the failure time is less than final time, the second time of the interval is the bigger visit time and the first time of the interval is the second bigger visit time.

### Value

The function return a data.frame on what:

| | |
|---|---|
| L | the first time of the interval generated |
| R | the second time of the interval generated |
| event | the indicator of interval censored data in the same way that is used in [Surv()] function from `survival` package. |
| X | the value of the covariates |

## Examples

```
ICsimple(50,0.8,0.8)
```

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ricI                                      *Generates Case I interval-censored Failure Time data*

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## Description

Generates Case I interval-censored Failure Time data as know as current status data. The failure time follows the Weibull regression model.

## Usage

```
ricI(n, shape, scale, pc, X = as.matrix(0), beta = as.matrix(0))
```

## Arguments

| | |
|---|---|
| n | number of observations to be generated |
| shape | the first parameter of Weibull distribution |
| scale | the second parameter of Weibull distribution |
| pc | the proportion of right-censored expected in the sample |
| X | the vector with the values of covariates. The number of rows of X must be equal n |
| beta | the vector with the value of the regression coefficients. The lenght of beta must be equal n |

## Details

First the function generates the failure time using [rweibull()]. The shape is the same and the second parameter is lambda. Lambda is equal to:

$$lambda = scale * exp(X * beta)$$

If there is no value to X and beta $lambda = scale$. Then is generated the only visit time. The shape is the same and the second parameter is gamma. Gamma is equal to:

$$gamma = (1 - pc) * lambda/(pc)$$

Then the is created the values of the intervals. If the failure time is greater then the visited time, the first time is the visited time, the second time is [Inf] and the failure time is right-censored. Orthewise the first time is [-Inf] , the second is the visited time and the visited time is left-censored.

## Value

The function return a data.frame on what:

| | |
|---|---|
| L | the first time of the interval generated |
| R | the second time of the interval generated |
| X | the value of the covariates |

## Examples

```
ricI(50,2,2,0.5)
```

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