Package ‘Opportunistic’

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Type Package
Title Routing Distribution, Broadcasts, Transmissions and Receptions in an Opportunistic Network
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Description Computes the routing distribution, the expectation of the number of broadcasts, transmissions and receptions considering an Opportunistic transport model. It provides theoretical results and also estimated values based on Monte Carlo simulations.
License GPL (>= 2)
Suggests hopbyhop, endtoend
NeedsCompilation no
Repository CRAN
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Expected

Theoretical broadcasts/transmissions/receptions for an Opportunistic model

Description

This function computes the probability of success and the expected values of the number of broadcasts, transmissions and receptions for an Opportunistic model.
MonteCarlo

Usage

Expected(p)

Arguments

p vector of probabilities of length N where N represents the number of hops

Value

A matrix with the probabilities and expected values for an Opportunistic model for all hops sizes <= N

Author(s)

Christian E. Galarza and Jonathan M. Olate

References


See Also

routes, MonteCarlo

Examples

#An N=3 Opportunistic system with probabilities p = c(0.0,0.4,0.1)
res1 = Expected(p=c(0.9,0.4,0.1))
res1

MonteCarlo

Monte Carlo broadcasts/transmissions/receptions for an Opportunistic model

Description

This function estimates via Monte Carlo the probability of success and the expected values of the number of broadcasts, transmissions and receptions for an Opportunistic model.

Usage

MonteCarlo(p, M = 10^4)

Arguments

p vector of probabilities of length N where N represents the number of hops

M Total number of Monte Carlo simulations
Details

N is computed from p length. M is code10^4 by default.

Value

A vector with the success probability and expected values (broadcast, transmissions and receptions) for an N Opportunistic model.

Author(s)

Christian E. Galarza and Jonathan M. Olate

References


See Also

routes, Expected

Examples

# Monte Carlo simulation for an N=3 Opportunistic system with probabilities
# p = c(0.0,0.4,0.1)

res2 = MonteCarlo(p=c(0.9,0.4,0.1), M=10^4)
res2

routes(p, delta = 0)

Arguments

p

vector of probabilities of length N where N represents the number of hops

delta

Delta value when considering uncertain probabilities. The interval is of the type p +/- delta.
Details

By default, delta is considered to be zero disregarding uncertainty.

Value

A data frame containing the routes, frequencies, and respective probabilities.

Author(s)

Christian E. Galarza and Jonathan M. Olate

See Also

Expected, MonteCarlo

Examples

```r
## Not run:
#An N=7 Opportunistic system with probabilities p1 = 0.7,...,p7 = 0.1

> p = seq(0.7,0.1,length.out = 7)
> routes(p)

<table>
<thead>
<tr>
<th>route</th>
<th>Freq</th>
<th>Probability</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>route 1</td>
<td>1</td>
<td>p1^7</td>
<td>0.08235</td>
</tr>
<tr>
<td>route 2</td>
<td>6</td>
<td>p1^5*p2</td>
<td>0.10084</td>
</tr>
<tr>
<td>route 3</td>
<td>10</td>
<td>p1^3*p2^2</td>
<td>0.12348</td>
</tr>
<tr>
<td>route 4</td>
<td>4</td>
<td>p1*p2^3</td>
<td>0.1512</td>
</tr>
<tr>
<td>route 5</td>
<td>5</td>
<td>p1^4*p3</td>
<td>0.12005</td>
</tr>
<tr>
<td>route 6</td>
<td>12</td>
<td>p1^2<em>p2</em>p3</td>
<td>0.147</td>
</tr>
<tr>
<td>route 7</td>
<td>3</td>
<td>p2^2*p3</td>
<td>0.18</td>
</tr>
<tr>
<td>route 8</td>
<td>3</td>
<td>p1*p3^2</td>
<td>0.175</td>
</tr>
<tr>
<td>route 9</td>
<td>4</td>
<td>p1^3*p4</td>
<td>0.1372</td>
</tr>
<tr>
<td>route 10</td>
<td>6</td>
<td>p1<em>p2</em>p4</td>
<td>0.168</td>
</tr>
<tr>
<td>route 11</td>
<td>2</td>
<td>p3*p4</td>
<td>0.2</td>
</tr>
<tr>
<td>route 12</td>
<td>3</td>
<td>p1^2*p5</td>
<td>0.147</td>
</tr>
<tr>
<td>route 13</td>
<td>2</td>
<td>p2*p5</td>
<td>0.18</td>
</tr>
<tr>
<td>route 14</td>
<td>2</td>
<td>p1*p6</td>
<td>0.14</td>
</tr>
<tr>
<td>route 15</td>
<td>1</td>
<td>p7</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Total  64

## End(Not run)
```
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