

Package ‘WordOfMouth’

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Type Package

Title Estimates Economic Variables for Word-of-Mouth-Campaigns

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Maintainer Michael Scholz <michael.scholz@th-deg.de>

Description

Methods for estimating profit, profit-maximizing price, demand and consumer surplus of Word-of-Mouth-campaigns on mean-field networks.

License GPL-3

Depends R (>= 3.0.1), methods, stats, LambertW

LazyLoad yes

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Author Michael Scholz [cre, aut],
Thomas Woehner [aut],
Ralf Peters [ctb]

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R topics documented:

WordOfMouth-package	2
computeConsumerSurplus	2
computeDemand	3
computeOptimalPrice	4
computeProfit	5
computeRoundDemand	6
show,WoMCampaign-method	7
show,WoMNetwork-method	7
WoMCampaign-class	8
WoMNetwork-class	9

WordOfMouth-package *Estimates Economic Variables for Word-of-Mouth-Campaigns*

Description

This packages provides classes, methods and functions for modeling Word-of-Mouth-campaigns. General model assumptions are:

- monopoly market
- no variable costs
- network is the mean-field case of percolation
- only those persons who bought a product will forward information about it

Details

Package: WordOfMouth
Type: Package
Version: 1.0.0
Date: 2020-03-27
License: GPL-3
Depends: R (>= 3.0.1), methods

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

computeConsumerSurplus
Computes the expected cumulative consumer surplus

Description

Computes the expected cumulative consumer surplus for a given Word-of-Mouth campaign at a given price.

Usage

```
computeConsumerSurplus(campaign, price)
```

Arguments

campaign Word-of-Mouth campaign as instance of class WoMCampaign.
price Price as number in [0; 1] where 0 is the minimal and 1 is the maximal price.

Value

Expected cumulative consumer surplus.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

See Also

[computeDemand](#) [computeProfit](#) [computeOptimalPrice](#)

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
surplus <- computeConsumerSurplus(campaign, price = 0.5)
print(surplus)
```

computeDemand	<i>Computes the expected demand</i>
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Description

Computes the expected demand for a given Word-of-Mouth campaign at a given price.

Usage

```
computeDemand(campaign, price)
```

Arguments

campaign Word-of-Mouth campaign as instance of class WoMCampaign.
price Price as number in [0; 1] where 0 is the minimal and 1 is the maximal price.

Value

Expected demand in number of persons.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

See Also

[computeRoundDemand](#) [computeProfit](#) [computeConsumerSurplus](#) [computeOptimalPrice](#)

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
demand <- computeDemand(campaign, price = 0.5)
print(demand)
```

computeOptimalPrice *Computes the profit-maximizing price*

Description

Computes the profit-maximizing for a given Word-of-Mouth campaign.

Usage

```
computeOptimalPrice(campaign)
```

Arguments

campaign Word-of-Mouth campaign as instance of class WoMCampaign.

Value

Profit-maximizing price in [0; 1] where 0 is the lowest possible and 1 is the highest possible price.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

See Also

[computeDemand](#) [computeProfit](#) [computeConsumerSurplus](#)

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
price <- computeOptimalPrice(campaign)
profit <- computeProfit(campaign, price)
print(price)
print(profit)
```

computeProfit	<i>Computes the expected profit</i>
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Description

Computes the expected profit for a given Word-of-Mouth campaign at a given price.

Usage

```
computeProfit(campaign, price)
```

Arguments

campaign	Word-of-Mouth campaign as instance of class WoMCampaign.
price	Price as number in [0; 1] where 0 is the minimal and 1 is the maximal price.

Value

Expected profit as number of persons times price.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

See Also

[computeDemand](#) [computeConsumerSurplus](#) [computeOptimalPrice](#)

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
profit <- computeProfit(campaign, price = 0.5)
print(profit)
```

computeRoundDemand *Computes the expected demand per round*

Description

Computes the expected demand for a given Word-of-Mouth campaign at a given price and a given round or a given round and all previous rounds

Usage

```
computeRoundDemand(campaign, price, round, previousRounds = TRUE)
```

Arguments

campaign Word-of-Mouth campaign as instance of class WoMCampaign.
price Price as number in [0; 1] where 0 is the minimal and 1 is the maximal price.
round Round at which or until which the demand per round will be computed.
previousRounds Should the demand of all previous rounds be returned or not. Default is TRUE.

Value

Expected demand in number of persons. Note that the first value in the demand vector is the number of initial consumers when previousRounds is TRUE. The number of initial consumers is $(1-p)*seedingSize$.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

See Also

[computeDemand](#) [computeProfit](#) [computeConsumerSurplus](#) [computeOptimalPrice](#)

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
demand <- computeRoundDemand(campaign, price = 0.5, round = 3)
print(demand)
```

show, WoMCampaign-method
Shows a WoMCampaign object

Description

Shows a WoMCampaign object

Usage

```
## S4 method for signature 'WoMCampaign'  
show(object)
```

Arguments

object An instance of the WoMCampaign-class

Methods

list("signature(object = \"WoMCampaign\")") Shows an WoMCampaign object.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>
Thomas Woehner <Thomas.Woehner@eah-jena.de>
Ralf Peters <ralf.peters@wiwi.uni-halle.de>

show, WoMNetwork-method
Shows a WoMNetwork object

Description

Shows a WoMNetwork object

Usage

```
## S4 method for signature 'WoMNetwork'  
show(object)
```

Arguments

object An instance of the WoMNetwork-class

Methods

`list("signature(object = \"WoMNetwork\")")` Shows an WoMNetwork object.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>

Thomas Woehner <Thomas.Woehner@eah-jena.de>

Ralf Peters <ralf.peters@wiwi.uni-halle.de>

WoMCampaign-class	<i>Class</i> WoMCampaign
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Description

Class WoMCampaign

Objects from the Class

Objects can be created by calls of the form `new("WoMCampaign", ...)`. This S4 class describes WoMNetwork objects.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>

Thomas Woehner <Thomas.Woehner@eah-jena.de>

Ralf Peters <ralf.peters@wiwi.uni-halle.de>

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
campaign <- new("WoMCampaign", network = network, seedingSize = 10, forwardProbability = 0.2)
print(campaign)
```

WoMNetwork-class	<i>Class</i> WoMNetwork
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Description

Class WoMNetwork

Objects from the Class

Objects can be created by calls of the form `new("WoMNetwork", ...)`. This S4 class describes WoMNetwork objects.

Author(s)

Michael Scholz <michael.scholz@th-deg.de>

Thomas Woehner <Thomas.Woehner@eah-jena.de>

Ralf Peters <ralf.peters@wiwi.uni-halle.de>

Examples

```
network <- new("WoMNetwork", size = 1000, avgConnections = 5)
print(network)
```

Index

*Topic **Word-of-Mouth**

WordOfMouth-package, [2](#)

*Topic **classes**

WoMCampaign-class, [8](#)

WoMNetwork-class, [9](#)

*Topic **methods**

show, WoMCampaign-method, [7](#)

show, WoMNetwork-method, [7](#)

computeConsumerSurplus, [2](#), [4-6](#)

computeDemand, [3](#), [3](#), [4-6](#)

computeOptimalPrice, [3](#), [4](#), [4](#), [5](#), [6](#)

computeProfit, [3](#), [4](#), [5](#), [6](#)

computeRoundDemand, [4](#), [6](#)

show, WoMCampaign-method, [7](#)

show, WoMNetwork-method, [7](#)

WoMCampaign-class, [8](#)

WoMNetwork-class, [9](#)

WordOfMouth (WordOfMouth-package), [2](#)

WordOfMouth-package, [2](#)