Package 'modelimpact'

July 23, 2025

Type Package

Title Functions to Assess the Business Impact of Churn Prediction Models

Version 1.0.0

Author Peer Christensen

Maintainer Peer Christensen <hr.pchristensen@gmail.com>

Description Calculate the financial impact of using a churn model in terms of cost, revenue, profit and return on investment.

License MIT + file LICENSE

URL https://github.com/PeerChristensen/modelimpact

BugReports https://github.com/PeerChristensen/modelimpact/issues

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports dplyr, magrittr, utils

Depends R (>= 2.10)

NeedsCompilation no

Repository CRAN

Date/Publication 2021-05-06 08:50:02 UTC

Contents

`cost_revenue` *Calculate cost and revenue*

Description

Calculates cost and revenue after sorting observations.

Usage

```
cost_revenue(
  x,
  fixed_cost = 0,
  var_cost = 0,
  tp_val = 0,
  prob_col = NA,
  truth_col = NA
)
```

Arguments

`x`	A data frame containing predicted probabilities of a target event and the actual outcome/class.
`fixed_cost`	Fixed cost (e.g. of a campaign)
`var_cost`	Variable cost (e.g. discount offered)
`tp_val`	The average value of a True Positive
`prob_col`	The unquoted name of the column with probabilities of the event of interest.
`truth_col`	The unquoted name of the column with the actual outcome/class. Possible values are 'Yes' and 'No'.

Value

A data frame with the following columns:

row = row numbers
pct = percentiles
cost_sum = cumulated costs
cum_rev = cumulated revenue

Examples

```
cost_revenue(predictions,
   fixed_cost = 1000,
   var_cost   = 100,
   tp_val     = 2000,
   prob_col   = Yes,
   truth_col  = Churn)
```

predictions *Predictions from a customer churn model.*

Description

A dataset containing 2145 observations with four columns specifying predicted probabilities and predicted and actual class.

Usage

```
predictions
```

Format

A data frame with 2145 rows and 4 variables:

predict Predicted class

No Predicted probability of class 'No'

Yes Predicted probability of class 'Yes'

Churn Actual class ...

profit *Calculate profit*

Description

Calculates profit after sorting observations.

Usage

```
profit(
  x,
  fixed_cost = 0,
  var_cost = 0,
  tp_val = 0,
  prob_col = NA,
  truth_col = NA
)
```

Arguments

x	A data frame containing predicted probabilities of a target event and the actual outcome/class.
fixed_cost	Fixed cost (e.g. of a campaign)
var_cost	Variable cost (e.g. discount offered)
tp_val	The average value of a True Positive
prob_col	The unquoted name of the column with probabilities of the event of interest.
truth_col	The unquoted name of the column with the actual outcome/class. Possible values are 'Yes' and 'No'.

Value

A data frame with the following columns:

row = row numbers
pct = percentiles
profit = profit for number of rows selected

Examples

```
profit(predictions,
     fixed_cost = 1000,
     var_cost   = 100,
     tp_val     = 2000,
     prob_col   = Yes,
     truth_col  = Churn)
```

---

profit_thresholds *Find optimal threshold for churn prediction (class)*

Description

Finds the optimal threshold (from a business perspective) for classifying churners.

Usage

```
profit_thresholds(
  x,
  var_cost = 0,
  prob_accept = 1,
  tp_val = 0,
  fp_val = 0,
  tn_val = 0,
  fn_val = 0,
  prob_col = NA,
  truth_col = NA
)
```

Arguments

x	A data frame containing predicted probabilities of a target event and the actual outcome/class.
var_cost	Variable cost (e.g. of a campaign offer)
prob_accept	Probability of offer being accepted. Defaults to 1.
tp_val	The average value of a True Positive. 'var_cost' is automatically subtracted.
fp_val	The average cost of a False Positive. 'var_cost' is automatically subtracted.
tn_val	The average value of a True Negative.
fn_val	The average cost of a False Negative.
prob_col	The unquoted name of the column with probabilities of the event of interest.
truth_col	The unquoted name of the column with the actual outcome/class. Possible values are 'Yes' and 'No'.
	#' @return A data frame with the following columns:
	threshold = prediction thresholds payoff = calculated profit for each threshold

Examples

```
profit_thresholds(predictions,
   var_cost    = 100,
   prob_accept = .8,
   tp_val      = 2000,
   fp_val      = 0,
   tn_val      = 0,
   fn_val      = -2000,
   prob_col    = Yes,
   truth_col   = Churn)
```

---

roi *Calculate Return on investment (ROI)*

Description

Calculates ROI after sorting observations with ROI defined as (Current Value - Start Value) / Start Value

Usage

```
roi(x, fixed_cost = 0, var_cost = 0, tp_val = 0, prob_col = NA, truth_col = NA)
```

Arguments

x	A data frame containing predicted probabilities of a target event and the actual outcome/class.
fixed_cost	Fixed cost (e.g. of a campaign)
var_cost	Variable cost (e.g. discount offered)
tp_val	The average value of a True Positive
prob_col	The unquoted name of the column with probabilities of the event of interest.
truth_col	The unquoted name of the column with the actual outcome/class. Possible values are 'Yes' and 'No'.

Value

A data frame with the following columns:

row = row numbers
pct = percentiles
cum_rev = cumulated revenue
cost_sum = cumulated costs
roi = return on investment

Examples

```
roi(predictions,
   fixed_cost = 1000,
   var_cost   = 100,
   tp_val     = 2000,
   prob_col   = Yes,
   truth_col  = Churn)
```

Index