Package 'rfm'

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Type Package

Title Recency, Frequency and Monetary Value Analysis

Version 0.2.2

Description Tools for RFM (recency, frequency and monetary value) analysis. Generate RFM score from both transaction and customer level data. Visualize the relationship between recency, frequency and monetary value using heatmap, histograms, bar charts and scatter plots. Includes a 'shiny' app for interactive segmentation. References: i. Blattberg R.C., Kim BD., Neslin S.A (2008) <doi:10.1007/978-0-387-72579-6_12>.

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URL https://github.com/rsquaredacademy/rfm, https://rfm.rsquaredacademy.com/

BugReports https://github.com/rsquaredacademy/rfm/issues

Depends R (>= 3.2)

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R topics documented:

`rfm` `rfm` *package*

Description

Tools for customer segmentation analysis

`rfm_barchart_data` *Bar chart data*

Description

Data for generating bar charts.

Usage

```
rfm_barchart_data(rfm_table)
```

Arguments

`rfm_table`	An object of class `rfm_table`.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# bar chart data
rfm_barchart_data(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# bar chart data
rfm_barchart_data(rfm_customer)
```

---

rfm_bar_chart *RFM bar chart*

Description

Examine the distribution of monetary scores for the different combinations of frequency and recency scores.

Usage

```
rfm_bar_chart(
  rfm_table,
  bar_color = "blue",
  xaxis_title = "Monetary Score",
  sec_xaxis_title = "Frequency Score",
  yaxis_title = " ",
  sec_yaxis_title = "Recency Score",
  print_plot = TRUE
)
```

Arguments

rfm_table	An object of class rfm_table.
bar_color	Color of the bars.
xaxis_title	X axis title.
sec_xaxis_title	Secondary x axis title.
yaxis_title	Y axis title.
sec_yaxis_title	Secondary y axis title.
print_plot	logical; if TRUE, prints the plot else returns a plot object.

Value

Bar chart.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# bar chart
rfm_bar_chart(rfm_order)
```

---

rfm_data_customer *RFM customer data*

Description

A dataset containing customer level data.

Usage

```
rfm_data_customer
```

Format

A tibble with 39,999 rows and 5 variables:

customer_id Customer id.

total_amount Total amount of all orders.

most_recent_visit Date of the most recent transaction.

number_of_purchases Total number of transactions/orders.

purchase_interval Number of days since last transaction/order.

rfm_data_orders *RFM transaction data*

Description

A dataset containing transactions of different customers.

Usage

```
rfm_data_orders
```

Format

A tibble with 49.6 rows and 3 variables:

order_date order date

customer_id customer id

revenue transaction amount

rfm_heatmap *RFM heatmap*

Description

The heat map shows the average monetary value for different categories of recency and frequency scores. Higher scores of frequency and recency are characterized by higher average monetary value as indicated by the darker areas in the heatmap.

Usage

```
rfm_heatmap(
  data,
  plot_title = "RFM Heat Map",
  plot_title_justify = 0.5,
  xaxis_title = "Frequency",
  yaxis_title = "Recency",
  legend_title = "Mean Monetary Value",
  brewer_n = 5,
  brewer_name = "PuBu",
  print_plot = TRUE
)
```

Arguments

data	An object of class rfm_table.
plot_title	Title of the plot.
plot_title_justify	Horizontal justification of the plot title; 0 for left justified and 1 for right justified.
xaxis_title	X axis title.
yaxis_title	Y axis title.
legend_title	Legend title.
brewer_n	Indicates the number of colors in the palette; RColorBrewer is used for the color palette of the heatmap; check the documentation of brewer.pal.
brewer_name	Palette name; check the documentation of brewer.pal.
print_plot	logical; if TRUE, prints the plot else returns a plot object.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# heat map
rfm_heatmap(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# heat map
rfm_heatmap(rfm_customer)
```

---

rfm_heatmap_data *Heatmap data*

Description

Data for generating heatmap.

Usage

```
rfm_heatmap_data(rfm_table)
```

Arguments

rfm_table	An object of class rfm_table.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# heat map data
rfm_heatmap_data(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# heat map data
rfm_heatmap_data(rfm_customer)
```

`rfm_histograms` *RFM histograms*

Description

Histograms of recency, frequency and monetary value.

Usage

```
rfm_histograms(
  rfm_table,
  hist_bins = 9,
  hist_color = "blue",
  plot_title = "RFM Histograms",
  xaxis_title = " ",
  yaxis_title = "Count",
  hist_m_label = "Monetary",
  hist_r_label = "Recency",
  hist_f_label = "Frequency",
  plot_title_justify = 0.5,
  print_plot = TRUE
)
```

Arguments

`rfm_table`	An object of class `rfm_table`.
`hist_bins`	Number of bins of the histograms.
`hist_color`	Color of the histogram.
`plot_title`	Title of the plot.

xaxis_title	X axis title.
yaxis_title	Y axis title.
hist_m_label	Label of the monetary value histogram.
hist_r_label	Label of the recency histogram.
hist_f_label	Label of the frequency histogram.
plot_title_justify	Horizontal justification of the plot title; 0 for left justified and 1 for right justified.
print_plot	logical; if TRUE, prints the plot else returns a plot object.

Value

Histograms

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# histogram
rfm_histograms(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# histogram
rfm_histograms(rfm_customer)
```

---

rfm_hist_data *Histogram data*

Description

Data for generating histograms.

Usage

```
rfm_hist_data(rfm_table)
```

Arguments

rfm_table	An object of class rfm_table.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# histogram data
rfm_hist_data(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# histogram data
rfm_hist_data(rfm_customer)
```

---

rfm_launch_app *Launch shiny app*

Description

Launches shiny app.

Usage

```
rfm_launch_app()
```

Examples

```
## Not run:
rfm_launch_app()

## End(Not run)
```

---

rfm_order_dist *Customers by orders*

Description

Visualize the distribution of customers across orders.

Usage

```
rfm_order_dist(
  rfm_table,
  bar_color = "blue",
  xaxis_title = "Orders",
  yaxis_title = "Customers",
  plot_title = "Customers by Orders",
  plot_title_justify = 0.5,
  print_plot = TRUE
)
```

Arguments

rfm_table	An object of class rfm_table.
bar_color	Color of the bars.
xaxis_title	X axis title.
yaxis_title	Y axis title.
plot_title	Title of the plot.
plot_title_justify	Horizontal justification of the plot title; 0 for left justified and 1 for right justified.
print_plot	logical; if TRUE, prints the plot else returns a plot object.

Value

Bar chart.

Examples

```
# using transaction data
analysis_date <- lubridate::as_date('2006-12-31')
rfm_order <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# order distribution
rfm_order_dist(rfm_order)

# using customer data
analysis_date <- lubridate::as_date('2007-01-01')
rfm_customer <- rfm_table_customer(rfm_data_customer, customer_id,
number_of_orders, recency_days, revenue, analysis_date)

# order distribution
rfm_order_dist(rfm_customer)
```

rfm_plot_median_recency *Segmentation plots*

Description

Segment wise median recency, frequency & monetary value plot.

Usage

```
rfm_plot_median_recency(rfm_segment_table, print_plot = TRUE)

rfm_plot_median_frequency(rfm_segment_table, print_plot = TRUE)

rfm_plot_median_monetary(rfm_segment_table, print_plot = TRUE)
```

Arguments

rfm_segment_table	Output from rfm_segment.
print_plot	logical; if TRUE, prints the plot else returns a plot object.

Examples

```
analysis_date <- lubridate::as_date('2006-12-31')
rfm_result <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

segment_names <- c("Champions", "Loyal Customers", "Potential Loyalist",
  "New Customers", "Promising", "Need Attention", "About To Sleep",
  "At Risk", "Can't Lose Them", "Lost")

recency_lower <- c(4, 2, 3, 4, 3, 2, 2, 1, 1, 1)
recency_upper <- c(5, 5, 5, 5, 4, 3, 3, 2, 1, 2)
frequency_lower <- c(4, 3, 1, 1, 1, 2, 1, 2, 4, 1)
frequency_upper <- c(5, 5, 3, 1, 1, 3, 2, 5, 5, 2)
monetary_lower <- c(4, 3, 1, 1, 1, 2, 1, 2, 4, 1)
monetary_upper <- c(5, 5, 3, 1, 1, 3, 2, 5, 5, 2)

segments <- rfm_segment(rfm_result, segment_names, recency_lower,
recency_upper, frequency_lower, frequency_upper, monetary_lower,
monetary_upper)

rfm_plot_median_recency(segments)
rfm_plot_median_frequency(segments)
rfm_plot_median_monetary(segments)
```

`rfm_rm_plot` *RFM Scatter plot*

Description

Examine the relationship between recency, frequency and monetary values.

Usage

```
rfm_rm_plot(
  rfm_table,
  point_color = "blue",
  xaxis_title = "Monetary",
  yaxis_title = "Recency",
  plot_title = "Recency vs Monetary",
  print_plot = TRUE
)

rfm_fm_plot(
  rfm_table,
  point_color = "blue",
  xaxis_title = "Monetary",
  yaxis_title = "Frequency",
  plot_title = "Frequency vs Monetary",
  print_plot = TRUE
)

rfm_rf_plot(
  rfm_table,
  point_color = "blue",
  xaxis_title = "Frequency",
  yaxis_title = "Recency",
  plot_title = "Recency vs Frequency",
  print_plot = TRUE
)
```

Arguments

`rfm_table`	An object of class `rfm_table`.
`point_color`	Color of the scatter points.
`xaxis_title`	X axis title.
`yaxis_title`	Y axis title.
`plot_title`	Title of the plot.
`print_plot`	logical; if `TRUE`, prints the plot else returns a plot object.

Value

Scatter plot.

Examples

```
# rfm table
analysis_date <- lubridate::as_date('2006-12-31')
rfm_result <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

# monetary value vs recency
rfm_rm_plot(rfm_result)

# frequency vs monetary value
rfm_fm_plot(rfm_result)

# frequency vs recency
rfm_rf_plot(rfm_result)
```

---

rfm_segment *Segmentation*

Description

Create segments based on recency, frequency and monetary scores.

Usage

```
rfm_segment(
  data,
  segment_names = NULL,
  recency_lower = NULL,
  recency_upper = NULL,
  frequency_lower = NULL,
  frequency_upper = NULL,
  monetary_lower = NULL,
  monetary_upper = NULL
)
```

Arguments

data	An object of class rfm_table.
segment_names	Names of the segments.
recency_lower	Lower boundary for recency score.
recency_upper	Upper boundary for recency score.

frequency_lower
: Lower boundary for frequency score.

frequency_upper
: Upper boundary for frequency score.

monetary_lower
: Lower boundary for monetary score.

monetary_upper
: Upper boundary for monetary score.

Examples

```
analysis_date <- lubridate::as_date('2006-12-31')
rfm_result <- rfm_table_order(rfm_data_orders, customer_id, order_date,
revenue, analysis_date)

segment_names <- c("Champions", "Loyal Customers", "Potential Loyalist",
  "New Customers", "Promising", "Need Attention", "About To Sleep",
  "At Risk", "Can't Lose Them", "Lost")

recency_lower <- c(4, 2, 3, 4, 3, 2, 2, 1, 1, 1)
recency_upper <- c(5, 5, 5, 5, 4, 3, 3, 2, 1, 2)
frequency_lower <- c(4, 3, 1, 1, 1, 2, 1, 2, 4, 1)
frequency_upper <- c(5, 5, 3, 1, 1, 3, 2, 5, 5, 2)
monetary_lower <- c(4, 3, 1, 1, 1, 2, 1, 2, 4, 1)
monetary_upper <- c(5, 5, 3, 1, 1, 3, 2, 5, 5, 2)

rfm_segment(rfm_result, segment_names, recency_lower, recency_upper,
frequency_lower, frequency_upper, monetary_lower, monetary_upper)
```

---

rfm_table_customer *RFM table (customer data)*

Description

Recency, frequency, monetary and RFM score.

Usage

```
rfm_table_customer(
  data = NULL,
  customer_id = NULL,
  n_transactions = NULL,
  recency_days = NULL,
  total_revenue = NULL,
  analysis_date = NULL,
  recency_bins = 5,
  frequency_bins = 5,
  monetary_bins = 5,
  ...
)
```

Arguments

data	A data.frame or tibble.
customer_id	Unique id of the customer.
n_transactions	Number of transactions/orders.
recency_days	Number of days since the last transaction.
total_revenue	Total revenue from the customer.
analysis_date	Date of analysis.
recency_bins	Number of bins for recency or custom threshold.
frequency_bins	Number of bins for frequency or custom threshold.
monetary_bins	Number of bins for monetary or custom threshold.
...	Other arguments.

Value

rfm_table_order returns a list with the following:

rfm	RFM table.
analysis_date	Date of analysis.
frequency_bins	Number of bins used for frequency score.
recency_bins	Number of bins used for recency score.
monetary_bins	Number of bins used for monetary score.
threshold	tibble with thresholds used for generating RFM scores.

Examples

```
analysis_date <- lubridate::as_date('2007-01-01')
rfm_table_customer(rfm_data_customer, customer_id, number_of_orders,
recency_days, revenue, analysis_date)

# access rfm table
result <- rfm_table_customer(rfm_data_customer, customer_id, number_of_orders,
recency_days, revenue, analysis_date)
result$rfm

# using custom threshold
rfm_table_customer(rfm_data_customer, customer_id, number_of_orders,
recency_days, revenue, analysis_date, recency_bins = c(115, 181, 297, 482),
frequency_bins = c(4, 5, 6, 8), monetary_bins = c(256, 382, 506, 666))
```

`rfm_table_customer_2` *RFM table 2 (customer data)*

Description

Recency, frequency, monetary and RFM score.

Usage

```
rfm_table_customer_2(
  data = NULL,
  customer_id = NULL,
  n_transactions = NULL,
  latest_visit_date = NULL,
  total_revenue = NULL,
  analysis_date = NULL,
  recency_bins = 5,
  frequency_bins = 5,
  monetary_bins = 5,
  ...
)
```

Arguments

`data`	A `data.frame` or `tibble`.
`customer_id`	Unique id of the customer.
`n_transactions`	Number of transactions/orders.
`latest_visit_date`	Date of the latest visit.
`total_revenue`	Total revenue from the customer.
`analysis_date`	Date of analysis.
`recency_bins`	Number of bins for recency or custom threshold.
`frequency_bins`	Number of bins for frequency or custom threshold.
`monetary_bins`	Number of bins for monetary or custom threshold.
`...`	Other arguments.

Value

`rfm_table_order` returns a list with the following:

`rfm`	RFM table.
`analysis_date`	Date of analysis.
`frequency_bins`	Number of bins used for frequency score.
`recency_bins`	Number of bins used for recency score.
`monetary_bins`	Number of bins used for monetary score.
`threshold`	tibble with thresholds used for generating RFM scores.

Examples

```
analysis_date <- lubridate::as_date('2007-01-01')
rfm_table_customer_2(rfm_data_customer, customer_id, number_of_orders,
most_recent_visit, revenue, analysis_date)

# access rfm table
result <- rfm_table_customer_2(rfm_data_customer, customer_id, number_of_orders,
most_recent_visit, revenue, analysis_date)
result$rfm

# using custom threshold
rfm_table_customer_2(rfm_data_customer, customer_id, number_of_orders,
most_recent_visit, revenue, analysis_date, recency_bins = c(115, 181, 297, 482),
frequency_bins = c(4, 5, 6, 8), monetary_bins = c(256, 382, 506, 666))
```

---

rfm_table_order *RFM table (transaction data)*

Description

Recency, frequency, monetary and RFM score.

Usage

```
rfm_table_order(
  data = NULL,
  customer_id = NULL,
  order_date = NULL,
  revenue = NULL,
  analysis_date = NULL,
  recency_bins = 5,
  frequency_bins = 5,
  monetary_bins = 5,
  ...
)
```

Arguments

data	A data.frame or tibble.
customer_id	Unique id of the customer.
order_date	Date of the transaction.
revenue	Revenue from the customer.
analysis_date	Date of analysis.
recency_bins	Number of bins for recency or custom threshold.
frequency_bins	Number of bins for frequency or custom threshold.
monetary_bins	Number of bins for monetary or custom threshold.
...	Other arguments.

Value

`rfm_table_order` returns a list with the following:

`rfm`	RFM table.
`analysis_date`	Date of analysis.
`frequency_bins`	Number of bins used for frequency score.
`recency_bins`	Number of bins used for recency score.
`monetary_bins`	Number of bins used for monetary score.
`threshold`	tibble with thresholds used for generating RFM scores.

Examples

```
analysis_date <- lubridate::as_date('2006-12-31')
rfm_table_order(rfm_data_orders, customer_id, order_date, revenue, analysis_date)

# access rfm table
result <- rfm_table_order(rfm_data_orders, customer_id, order_date, revenue, analysis_date)
result$rfm

# using custom threshold
rfm_table_order(rfm_data_orders, customer_id, order_date, revenue, analysis_date,
recency_bins = c(115, 181, 297, 482), frequency_bins = c(4, 5, 6, 8),
monetary_bins = c(256, 382, 506, 666))
```

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