Package 'collector'

May 21, 2019

Title Quantified Risk Assessment Data Collection

Version 0.1.2

Description An open source process for collecting quantified data inputs from subject matter experts. Intended for feeding into an OpenFAIR analysis <https://www2.opengroup.org/ogsys/catalog/C13K> using a tool such as 'evaluator' <https://evaluator.tidyrisk.org>.

Depends R (>= 3.4.0)

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Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

Imports EnvStats, dplyr, evaluator (>= 0.4.0), flextable, ggplot2, ggpubr, magrittr, purrr, quanteda, readr, rlang, rmarkdown, stringr, tibble, tidyr, officer, xaringan

Suggests spelling, testthat, covr, knitr

SystemRequirements pandoc

URL https://collector.tidyrisk.org

BugReports https://github.com/davidski/collector/issues

Language en-US

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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R topics documented:

`calibration_questions` *Calibration questions*

Description

A dataset of reference trivia questions for calibrating SMEs.

Usage

```
calibration_questions
```

Format

A data frame with 27 rows and 3 variables:

question text of the calibration question

answer answer text to the calibration question

calibration_id unique identifier for the calibration question

Source

Common trivia questions drawn from a variety of open source web resources.

`check_readability` *Check the readability of scenario text*

Description

Calculate the Flesch-Kincaid score for each scenario and return that score along with the scenario ID and domain as a tidy dataframe.

Usage

```
check_readability(x)
```

Arguments

`x`	A `tidyrisk_question_set` object

Value

A dataframe of the scenario id, domain, and the Flesch-Kincaid readability score.

Examples

```
## Not run:
questions <- read_questions()
check_readability(questions)

## End(Not run)
```

`clean_answers` *Clean extreme answers*

Description

You may wish to apply some sanity checking bounds on the responses from subject matter experts. This function applies a set of predefined transformations to the scenario and capability responses. Review these assumptions carefully before using them in your own analysis.

Usage

```
clean_answers(scenario_answers, capability_answers)
```

Arguments

`scenario_answers`
: Scenario answers dataframe.

`capability_answers`
: Capability answers dataframe.

Details

Make the following assumptions/modifications

- minimum capacity is 5
  - maximum capacity is 95
  - minimum loss is 1000 dollars (both low and high)
  - scale all impact into thousands of dollars (make normal decomposition easier, and is in line of the scale of a strategic analysis)
  - set a minimum frequency of once per 10 years (0.1)

Value

A list of modified scenarios and capabilities.

Examples

```
data(mc_capability_answers)
data(mc_scenario_answers)
clean_answers(mc_scenario_answers, mc_capability_answers)
```

collector *collector package*

Description

Quantified Information Risk Assessment Data Collection

Details

See the online documentation located at https://evaluator.tidyrisk.org/

combine_capability_parameters *Combine multiple SME distributions into a single unified view*

Description

Given a dataframe with multiple SME fitted distributions for a single capability, apply weighting for opinion pooling, and construct a final combined distribution for each OpenFAIR scenario parameter.

Usage

```
combine_capability_parameters(capability_parameters)
```

Arguments

capability_parameters	Fitted individual parameters for capabilities.

Value

A dataframe.

Examples

```
NULL
```

combine_lognorm *Weight a set of lognormal parameters into a single distribution*

Description

Weight a set of lognormal parameters into a single distribution

Usage

```
combine_lognorm(dat)
```

Arguments

dat	A dataframe.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
dat <- data.frame(meanlog = c(1, 1.5),
                  sdlog = c(1, 2),
                  weight = c(2, 1))
combine_lognorm(dat)
```

combine_lognorm_trunc *Weight a set of lognormal parameters into a single distribution*

Description

Weight a set of lognormal parameters into a single distribution

Usage

```
combine_lognorm_trunc(dat)
```

Arguments

dat	Dataframe of meanlog, sdlog, min, max, and sdlog.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
dat <- data.frame(meanlog = c(1, 1.5),
                  sdlog = c(1, 2),
                  min = 0,
                  max = Inf,
                  weight = c(2, 1))
combine_lognorm_trunc(dat)
```

---

combine_norm *Weight a set of normal parameters into a single distribution*

Description

Given a set of arbitrary parameters that includes at least a weight column, take a weighted average of all the other parameters.

Usage

```
combine_norm(dat)
```

Arguments

dat	Dataframe of mean, sd and weights.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
dat <- data.frame(mean = c(10, 20, 30),
                  sd = c(4, 5, 10),
                  weight = c(2, 1, 2))
combine_norm(dat)
```

`combine_scenario_parameters` *Combine multiple SME distributions into a single unified view*

Description

Given a dataframe with multiple SME fitted distributions for a single scenario, decompose the lognormal distribution into normal parameters, apply weighting for opinion pooling, and construct a final combined distribution for each OpenFAIR scenario factor.

Usage

```
combine_scenario_parameters(scenario_parameters)
```

Arguments

`scenario_parameters`
: Fitted scenario factors for individual SMEs.

Value

A dataframe.

Examples

```
NULL
```

`derive_controls` *Generate the quantified capability parameters for a scenario*

Description

Based on the `evaluator::derive_controls` function

Usage

```
derive_controls(capability_ids, capability_parameters)
```

Arguments

capability_ids	Comma-delimited list of capability ids
capability_parameters	Dataframe of fitted and combined capability parameters

Details

Creates the difficulty parameters (embedded list) for quantitative parameters.

Value

A list.

See Also

evaluator::derive_controls

Examples

```
NULL
```

---

enforce_tidyrisk_question_set

Validate that the parameter passed is a tidyrisk_question_set *object*

Description

Validate that the parameter passed is a tidyrisk_question_set object

Usage

```
enforce_tidyrisk_question_set(x)
```

Arguments

x	An object

Examples

```
NULL
```

enforce_tidyrisk_response_set

Validate that the parameter passed is a `tidyrisk_response_set` *object*

Description

Validate that the parameter passed is a `tidyrisk_response_set` object

Usage

```
enforce_tidyrisk_response_set(x)
```

Arguments

x	An object

Examples

```
NULL
```

fit_capabilities

Fit SME capability estimates to distribution parameters

Description

Fit SME capability estimates to distribution parameters

Usage

```
fit_capabilities(responses)
```

Arguments

responses	A `tidyrisk_response_set` object

Value

A dataframe.

See Also

Other distribution fitting functions: `combine_lognorm_trunc`, `combine_lognorm`, `combine_norm`, `fit_capabilities_geomean`, `fit_lognorm_trunc`, `fit_lognorm`, `fit_norm_trunc`, `fit_pois`, `fit_scenarios_geomean`, `fit_scenarios`, `fit_threat_communities`, `generate_cost_function`, `lognormal_to_normal`, `normal_to_lognormal`

Examples

```
NULL
```

`fit_capabilities_geomean` *Fit capability parameters via a geometric mean*

Description

Fit capability parameters via a geometric mean

Usage

```
fit_capabilities_geomean(capabilities_answers)
```

Arguments

`capabilities_answers`	Answers dataframe.

Value

A dataframe.

See Also

Other distribution fitting functions: `combine_lognorm_trunc`, `combine_lognorm`, `combine_norm`, `fit_capabilities`, `fit_lognorm_trunc`, `fit_lognorm`, `fit_norm_trunc`, `fit_pois`, `fit_scenarios_geomean`, `fit_scenarios`, `fit_threat_communities`, `generate_cost_function`, `lognormal_to_normal`, `normal_to_lognormal`

Examples

```
data(mc_capability_answers)
fit_capabilities_geomean(mc_capability_answers)
```

`fit_lognorm` *Find parameters that fit quantile values of an unknown lognormal distribution*

Description

With a 5th and 95th quantile point estimates, fit a lognormal distribution, returning the parameters of the distribution.

Usage

```
fit_lognorm(low, high)
```

Arguments

`low`	5th quantile.
`high`	95th quantile.

Value

A dataframe.

See Also

Other distribution fitting functions: `combine_lognorm_trunc`, `combine_lognorm`, `combine_norm`, `fit_capabilities_geomean`, `fit_capabilities`, `fit_lognorm_trunc`, `fit_norm_trunc`, `fit_pois`, `fit_scenarios_geomean`, `fit_scenarios`, `fit_threat_communities`, `generate_cost_function`, `lognormal_to_normal`, `normal_to_lognormal`

Examples

```
fit_lognorm(low = .20, high = .50)
```

`fit_lognorm_trunc` *Find parameters that fit quantile values of an unknown truncated lognormal distribution*

Description

With a 5th and 95th quantile point estimates and optional lower and upper bounds, fit a lognormal distribution, returning the parameters of the distribution.

Usage

```
fit_lognorm_trunc(low, high, min = 0, max = Inf)
```

Arguments

low	5th quantile.
high	95th quantile.
min	lower bound of support.
max	upper bound of support.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
fit_lognorm_trunc(low = 10, high = 50, min = 0, max = 100)
```

---

fit_norm_trunc *Find parameters that fit quantile values of an unknown truncated normal distribution*

Description

With a 5th and 95th quantile point estimates and optional lower and upper bounds, fit a truncated normal distribution, returning the parameters of the distribution.

Usage

```
fit_norm_trunc(low, high, min = 0, max = Inf)
```

Arguments

low	5th quantile.
high	95th quantile.
min	Lower bound of support.
max	Upper bound of support.

Value

Dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
fit_norm_trunc(low = 10, high = 50, min = 0, max = 100)
```

---

fit_pois *Find parameters that fit a poisson distribution.*

Description

With a 5th and 95th quantile point estimates and optional lower and upper bounds, fit a poisson distribution, returning the parameters of the distribution.

Usage

```
fit_pois(low, high)
```

Arguments

low	5th quantile.
high	95th quantile.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
fit_pois(low = 10, high = 50)
```

`fit_scenarios` *Fit SME scenario estimates to distribution parameters*

Description

Given a set of subject matter expert estimates for the 5th and 95th quantiles of impact and frequency of contact for events, calculate the distribution parameters for TEF and LM. Use a truncated lognormal distribution for LM (losses cannot be infinite in size) and for the TEF.

Usage

```
fit_scenarios(responses, maximum_impact = Inf,
  maximum_impact_factor = 10, maximum_frequency_factor = 10)
```

Arguments

`responses`	A `tidyrisk_response_set` object.
`maximum_impact`	The absolute maximum potential impact of any single loss event.
`maximum_impact_factor`	Maximum impact factor - scaling factor of a SME's 95 percent maximum loss to limit the impact of any single event.
`maximum_frequency_factor`	Maximum frequency factor - scaling factor at which to limit frequency of events.

Value

A dataframe.

See Also

Other distribution fitting functions: `combine_lognorm_trunc`, `combine_lognorm`, `combine_norm`, `fit_capabilities_geomean`, `fit_capabilities`, `fit_lognorm_trunc`, `fit_lognorm`, `fit_norm_trunc`, `fit_pois`, `fit_scenarios_geomean`, `fit_threat_communities`, `generate_cost_function`, `lognormal_to_normal`, `normal_to_lognormal`

Examples

```
NULL
```

fit_scenarios_geomean *Fit scenario parameters by applying a geometric mean*

Description

Fit scenario parameters by applying a geometric mean

Usage

```
fit_scenarios_geomean(scenario_answers)
```

Arguments

scenario_answers	Scenario answers dataframe.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
data(mc_scenario_answers)
fit_scenarios_geomean(mc_scenario_answers)
```

fit_threat_communities *Fit each of the threat communities to a distribution*

Description

Fit each of the threat communities to a distribution

Usage

```
fit_threat_communities(threat_communities)
```

Arguments

threat_communities
: Dataframe of threat communities.

Value

A dataframe.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, generate_cost_function, lognormal_to_normal, normal_to_lognormal

Examples

```
data(mc_threat_communities)
fit_threat_communities(mc_threat_communities)
```

---

generate_cost_function

Generate a sum of squares cost function for optimization

Description

This is an internal helper function that generates a sum of squares cost function for any given r* function (e.g. rnorm, rlognorm). The resulting function is intended to be used by an optim call for fitting quantiles to distribution parameters.

Usage

```
generate_cost_function(func)
```

Arguments

func
: A distribution function.

Value

A function.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, lognormal_to_normal, normal_to_lognormal

Examples

```
generate_cost_function(stats::qlnorm)
```

`generate_weights` *Generate a weighting table for SMEs based upon their calibration answers*

Description

Generate a weighting table for SMEs based upon their calibration answers

Usage

```
generate_weights(questions, responses)
```

Arguments

`questions`	`tidyrisk_question_set` object.
`responses`	`tidyrisk_response_set` object

Value

A dataframe of SMEs and their numerical weighting.

Examples

```
NULL
```

`get_smes_domains` *Calculate the prioritized list of domains for a given subject matter expert (SME)*

Description

Given a `tidyrisk_question_set` object and the name and the name of a specific SME of interest, create a vector of the domains in order of priority.

Usage

```
get_smes_domains(sme, questions)
```

Arguments

`sme`	Name of the subject matter expert.
`questions`	A `tidyrisk_question_set` object.

Value

An ordered vector of the domains for the requested SME.

Examples

```
## Not run:
questions <- read_questions()
get_sme_domains("Sally Expert", questions)

## End(Not run)
```

`is_tidyrisk_question_set`

Test if the object is a tidyrisk_question_set

Description

This function returns TRUE for tidyrisk_question_set or sub-classes thereof, and FALSE for all other objects.

Usage

```
is_tidyrisk_question_set(x)
```

Arguments

`x`	An object

Examples

```
## Not run:
is_tidyrisk_question_set(x)

## End(Not run)
```

`is_tidyrisk_response_set`

Test if the object is a tidyrisk_response_set

Description

This function returns TRUE for tidyrisk_response_set or sub-classes thereof, and FALSE for all other objects.

Usage

```
is_tidyrisk_response_set(x)
```

Arguments

x	An object

Examples

```
## Not run:
is_tidyrisk_response_set(x)

## End(Not run)
```

---

lognormal_to_normal *Convert lognormal parameters to normal parameters*

Description

Given a set of parameters describing a lognormal distribution, return the parameters of the underlying normal distribution.

Usage

```
lognormal_to_normal(meanlog, sdlog)
```

Arguments

meanlog	Mean log.
sdlog	Standard deviation log.

Value

A list.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, normal_to_lognormal

Examples

```
lognormal_to_normal(meanlog=1, sdlog=3)
```

make_handouts *Create a set of interview handouts for a SME*

Description

Creates two MS Word documents. One is an `answers` document that contains the answers to the calibration questions, the other (with the name of the SME) does not contain answers and is intended to be a visual reference (and possible take away) for the SME.

Usage

```
make_handouts(sme, questions, output_dir, calibration_questions = 10)
```

Arguments

`sme`	Name of the SME.
`questions`	`tidyrisk_question_set` object
`output_dir`	Directory to place output.
`calibration_questions`	Number of calibration questions to ask.

Examples

```
## Not run:
questions <- read_questions()
make_handouts("Sally Expert", questions, output_dir = tempdir())

## End(Not run)
```

make_scorecard *Create a scorecard for marking progress through domains in an interview*

Description

Creates a two page PDF with one grid for scenarios and one for capabilities. Each grid contains a square for each domain. An analyst can mark/stamp each domain as it is covered in an interview, gamifying progress.

Usage

```
make_scorecard(sme, questions, output_dir)

make_bingo(sme, questions, output_dir = getwd())
```

Arguments

sme	Name of SME.
questions	tidyrisk_question_set object.
output_dir	Directory to place scorecards.

Details

The domains are ordered according to the SME's expertise profile, ensuring they match the interview order flow.

Value

An invisible null.

Examples

```
## Not run:
questions <- read_questions()
make_scorecard("Sally Expert", questions, output_dir = tempdir())

## End(Not run)
```

---

make_slides *Create interview slides*

Description

Creates an in-browser slideshow as a visual aide when conducting an interview with a subject matter expert (SME). The slideshow is customized for the SME by placing the domains in the order of preference for that SME.

Usage

```
make_slides(sme, questions, output_dir,
  assessment_title = "Strategic Risk Assessment")
```

Arguments

sme	Name of the SME being interviewed.
questions	A tidyrisk_question_set object.
output_dir	Directory location for knitted slides.
assessment_title	Title of the assessment being performed.

Value

Invisibly returns the full path to the slide file.

Examples

```
## Not run:
make_slides("Sally Expert", questions, output_dir = tempdir())

## End(Not run)
```

`mc_calibration_answers` *MetroCare Hospital Calibration Answers*

Description

A dataset of SME answers to calibration questions.

Usage

```
mc_calibration_answers
```

Format

A data frame with 50 rows and 5 variables:

sme name of the subject matter expert

calibration_id unique identifier of the calibration question

low SME's low end estimate

high SME's high end estimate

date date of answer

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`mc_capabilities` *MetroCare Hospital Capabilities*

Description

A dataset of program capabilities.

Usage

```
mc_capabilities
```

Format

A data frame with 60 rows and 3 variables:

capability_id unique identifier of the capability

domain_id domain associated with the capability

capability text description of the capability

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

---

mc_capability_answers *MetroCare Hospital Capability Answers*

Description

A dataset of SME answers to capabilities.

Usage

```
mc_capability_answers
```

Format

A data frame with 1 rows and 7 variables:

sme name of the SME

capability_id identifier of the capability

low capability estimate, low

high capability estimate, high

date date of the answer

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

mc_capability_parameters_fitted *MetroCare Hospital Capability Parameters (fitted)*

Description

A dataset of sample fitted capability parameters.

Usage

```
mc_capability_parameters_fitted
```

Format

A data frame with 300 rows and 10 variables:

sme name of the sme providing the response

capability_id unique identifier

date text description of the threat community

capability_func capability sampling function

capability_mean capability mean

capability_sd capability standard deviation

capability_min capability minimum

capability_max capability maximum

low threat communities capability, high end

high threat communities capability, high end

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

mc_domains *MetroCare Hospital Domains*

Description

A dataset of program domains.

Usage

```
mc_domains
```

Format

A data frame with 15 rows and 4 variables:

domain domain title

description descriptive text describing the content of the domain

active logical flag indicating whether or not the domain is in use

domain_id unique domain id

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`mc_scenarios` *MetroCare Risk Scenarios*

Description

A dataset of sample risk scenarios.

Usage

```
mc_scenarios
```

Format

A data frame with 56 rows and 5 variables:

scenario_id unique identifier

scenario scenario description

threat_id threat community id

domain_id domain id

controls comma separated list of control ids

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

mc_scenario_answers *MetroCare Hospital Scenario Answers*

Description

A dataset of SME answers to scenarios.

Usage

```
mc_scenario_answers
```

Format

A data frame with 1 rows and 7 variables:

sme name of the SME

scenario_id identifier of the scenario

freq_low frequency estimate, low

freq_high frequency estimate, high

imp_low impact estimate, low

imp_high impact estimate, high

date date of the answer

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

mc_scenario_parameters_fitted *MetroCare Hospital Scenario Parameters (fitted)*

Description

A dataset of sample fitted scenario parameters.

Usage

```
mc_scenario_parameters_fitted
```

Format

A data frame with 280 rows and 17 variables:

sme name of the sme providing the response
scenario_id unique identifier
date date of the response
impact_func function to use for impact sampling
impact_meanlog threat communities capability, high end
impact_sdlog type of the threat community
impact_min action type of the threat community
impact_max action type of the threat community
imp_low action type of the threat community
imp_high action type of the threat community
frequency_func function to use for frequency sampling
frequency_meanlog frequency meanlog
frequency_sdlog frequency standard deviation log
frequency_min frequency minimum
frequency_max frequency maximum
freq_low action type of the threat community
freq_high action type of the threat community

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`mc_sme_top_domains` *MetroCare Hospital SME Top Domains*

Description

A dataset of focus domains per SME.

Usage

```
mc_sme_top_domains
```

Format

A data frame with 35 rows and 3 variables:

sme SME name
key index of domain
value name of domain

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`mc_threat_communities` *MetroCare Hospital Threat Communities*

Description

A dataset of sample threat communities.

Usage

```
mc_threat_communities
```

Format

A data frame with 6 rows and 7 variables:

threat_community text title of the threat community

threat_id unique identifier

definition text description of the threat community

low threat communities capability, low end

high threat communities capability, high end

category type of the threat community

action_type action type of the threat community

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`mc_threat_parameters_fitted`
MetroCare Hospital Threat Parameters (fitted)

Description

A dataset of sample fitted threat parameters.

Usage

```
mc_threat_parameters_fitted
```

Format

A data frame with 8 rows and 12 variables:

action_type action type

category category

definition text description of the threat community

high action type of the threat community

low type of the threat community

threat_community text title of the threat community

threat_func sampling function

threat_id unique identifier

threat_max threat maximum capability

threat_mean threat mean capability

threat_sd threat capability standard deviation

threat_min threat capability minimum

Source

This is hypothetical information. Any similarity to any other entity is completely coincidental.

`normal_to_lognormal` *Convert normal parameters to lognormal parameters*

Description

Given parameters that describe a normal distribution, convert them back to parameters for a lognormal distribution.

Usage

```
normal_to_lognormal(normmean, normsd)
```

Arguments

`normmean`	Mean.
`normsd`	Standard deviation.

Value

A list.

See Also

Other distribution fitting functions: combine_lognorm_trunc, combine_lognorm, combine_norm, fit_capabilities_geomean, fit_capabilities, fit_lognorm_trunc, fit_lognorm, fit_norm_trunc, fit_pois, fit_scenarios_geomean, fit_scenarios, fit_threat_communities, generate_cost_function, lognormal_to_normal

Examples

```
normal_to_lognormal(normmean = 20, normsd = 3)
```

---

prepare_data *Create one or more quantitative scenarios objects suitable for simulation by 'evaluator'*

Description

Given parameters for the scenarios, threat communities, capabilities, and the question set, generate a list of tidyrisk_scenario objects that may be fed into evaluator::run_simulation for Monte Carlo simulation.

Usage

```
prepare_data(scenario_parameters, capability_parameters, threat_parameters,
  questions)
```

Arguments

scenario_parameters	Scenarios with final parameters defined.
capability_parameters	Capabilities with final parameters defined.
threat_parameters	Threat communities with final parameters defined.
questions	A tidyrisk_question_set object.

Value

A list of one or more tidyrisk_scenario objects.

Examples

```
suppressPackageStartupMessages(library(dplyr))
data(mc_domains, mc_capabilities, mc_scenarios, mc_sme_top_domains,
     calibration_questions, mc_threat_communities)
question_set <- tidyrisk_question_set(mc_domains, mc_scenarios, mc_capabilities,
                          calibration_questions, mc_sme_top_domains,
                          mc_threat_communities)
```

```
response_set <- tidyrisk_response_set(mc_calibration_answers,
                          mc_scenario_answers, mc_capability_answers)
sme_weightings <- generate_weights(question_set, response_set)
data(mc_scenario_parameters_fitted, mc_capability_parameters_fitted,
                          mc_threat_parameters_fitted)
scenario_parameters <- left_join(mc_scenario_parameters_fitted, sme_weightings, by = "sme") %>%
  combine_scenario_parameters()
capability_parameters <- left_join(mc_capability_parameters_fitted, sme_weightings, by = "sme") %>%
  combine_capability_parameters()
quantitative_scenarios <- prepare_data(scenario_parameters,
                                       capability_parameters,
                                       mc_threat_parameters_fitted,
                                       question_set)
```

`read_questions` *Read scenario questions*

Description

Reads in all the questions for which subject matter expert input is needed. Includes the domains, capabilities, scenarios, calibration questions, and threat communities.

Usage

```
read_questions(source_dir, active_only = TRUE)
```

Arguments

`source_dir`	Directory location to find input files.
`active_only`	Read in only the active elements, defaults to TRUE.

Details

Expects the following files to be present:

- `domains.csv` - Domains
  - domain_id, domain
- `capabilities.csv` - Capabilities
  - domain_id, capability_id, capability
- `scenarios.csv` - Scenarios
  - scenario_id, scenario, threat_id, domain_id, controls
- `sme_top_domains.csv` - SME expertise
  - sme, domain1, domain2, domain3, domain4, domain5, domain6, domain7
- `calibration_questions.csv` - Calibration questions
- `threat_communities.csv` - Threat communities
  - threat_community, threat_id, definition, low, high

Value

A tidyrisk_question_set object

Examples

```
## Not run:
read_questions()

## End(Not run)
```

`read_responses` *Read all SMEs responses*

Description

Reads in all the responses recorded to the calibration, scenarios, and capability questions.

Usage

```
read_responses(source_dir = getwd())
```

Arguments

`source_dir`	Directory location where input files are found.

Details

Expects the following files to be present:

- `calibration_answers.csv` - Calibration
- `scenario_answers.csv` - Scenarios
- `capability_answers.csv` - Capabilities

Value

A tidyrisk_response_set object

Examples

```
## Not run:
read_responses()

## End(Not run)
```

`tidyrisk_question_set` *Construct a tidyrisk_question_set object*

Description

`new.tidyrisk_question_set` is a low-level constructor that takes a list of dataframes. `tidyrisk_question_set` constructs a tidyrisk_question_set object from dataframes. `as.tidyrisk_question_set` is a S3 generic that converts existing objects. `validate_tidyrisk_question_set` verifies that the data elements are internally consistent.

Usage

```
tidyrisk_question_set(domains, scenarios, capabilities, calibration,
  expertise, threat_communities)

new_tidyrisk_question_set(x)

as.tidyrisk_question_set(x, ...)

validate_tidyrisk_question_set(x)
```

Arguments

`domains`	Domains
`scenarios`	Scenario questions
`capabilities`	Capability questions
`calibration`	Calibration questions
`expertise`	SME expertise
`threat_communities`	Threat communities
`x`	object to coerce
`...`	Individual dataframes

Examples

```
NULL
```

`tidyrisk_response_set` *Construct a tidyrisk_response_set object*

Description

`new.tidyrisk_response_set` is a low-level constructor that takes a list of dataframes. `tidyrisk_response_set` constructs a tidyrisk_response_set from dataframes. `as.tidyrisk_response_set` is a S3 generic that converts existing objects.

Usage

```
tidyrisk_response_set(calibration_answers, scenario_answers,
  capability_answers)

new_tidyrisk_response_set(calibration_answers, scenario_answers,
  capability_answers)

as.tidyrisk_response_set(x, ...)
```

Arguments

`calibration_answers`	Calibration tidyrisk_response_set
`scenario_answers`	Scenarios tidyrisk_response_set
`capability_answers`	Capability tidyrisk_response_set
`x`	object to coerce
`...`	Individual dataframes

Examples

```
NULL
```

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