

Package ‘senseR’

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Title Proxy Indicator Diagnostic Tool for Analytical and Policy Use

Version 0.1.0

Description Provides statistical diagnostics to evaluate whether proxy indicators reliably represent an unobservable target construct. The main function 'senseR()' assesses proxies across multiple dimensions including monotonicity, information content, stability, distributional alignment, and potential bias risk. It prints a concise, interpretable summary suitable for analytical and policy-oriented assessment, without claiming causal inference.

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Encoding UTF-8

RoxygenNote 7.3.3

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

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senser

Proxy Indicator Diagnostic Tool

Description

`senser()` is a statistical diagnostic function designed to evaluate whether one or more proxy indicators are suitable representations of an underlying construct that cannot be directly observed or measured.

The function assesses each proxy based on multiple statistical dimensions: monotonicity, information content, stability, distributional alignment, bias risk, and dynamic range (sensitivity).

The output is returned as a structured data.frame containing quantitative scores and qualitative classifications suitable for applied research and policy diagnostics.

Usage

```
senser(  
  data,  
  proxy,  
  target,  
  lang = c("english", "indonesia"),  
  stagnation_cut = 0.01,  
  cv_cut = 0.02,  
  ceiling_cut = 0.95  
)
```

Arguments

<code>data</code>	A data.frame containing the target construct and proxy variables.
<code>proxy</code>	Character vector specifying one or more proxy variable names contained in data.
<code>target</code>	Character string specifying the target construct variable name contained in data.
<code>lang</code>	Language for status labels and interpretation text. Must be either "english" or "indonesia".
<code>stagnation_cut</code>	Threshold used to detect stagnation (very small average absolute change). Default is 0.01.
<code>cv_cut</code>	Threshold for the coefficient of variation (CV). Default is 0.02.
<code>ceiling_cut</code>	Threshold used to detect ceiling effects. Default is 0.95.

Details

The diagnostic score for each proxy is computed using six normalized components:

- **monotonicity**: Spearman rank correlation.
- **information_content**: R-squared from linear regression.

- **elasticity_score**: Responsiveness index.
- **variability_score**: Based on coefficient of variation.
- **stagnation_score**: Penalizes near-flat dynamics.
- **ceiling_score**: Penalizes ceiling effects.
- **stability_score**: Coefficient stability across subsamples.

The final proxy score is computed as the median of all components.

Classification categories:

- Score ≥ 0.70 : Suitable proxy
- $0.40 \leq$ Score < 0.70 : Conditionally suitable
- Score < 0.40 : Not suitable proxy

Value

A data.frame with one row per proxy variable containing:

target Target construct name.
proxy Proxy variable name.
monotonicity Spearman correlation (absolute).
information_content R-squared value.
elasticity Elasticity index.
cv Coefficient of variation.
avg_change Average absolute change.
ceiling_ratio Mean-to-maximum ratio.
stability_score Coefficient stability index.
final_score Median diagnostic score.
classification Qualitative proxy category.
interpretation Plain-language interpretation.

Author(s)

Joko Nursiyono

References

- Spearman, C. (1904). The proof and measurement of association between two things. *American Journal of Psychology*, 15(1), 72–101.
- Chow, G. C. (1960). Tests of equality between sets of coefficients in two linear regressions. *Econometrica*.
- OECD (2008). Handbook on Constructing Composite Indicators: Methodology and User Guide.

See Also

[lm](#), [cor](#), [median](#)

Examples

```
set.seed(123)
df <- data.frame(
  gdp = rnorm(100, 10, 2),
  ntl = rnorm(100, 50, 10),
  road_density = rnorm(100, 3, 0.5)
)

senser(
  data = df,
  proxy = c("ntl", "road_density"),
  target = "gdp",
  lang = "english"
)
```

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