

# Package ‘cassowaryr’

August 9, 2022

**Title** Compute Scagnostics on Pairs of Numeric Variables in a Data Set

**Version** 2.0.0

**Description** Computes a range of scatterplot diagnostics (scagnostics) on pairs of numerical variables in a data set. A range of scagnostics, including graph and association-based scagnostics described by Leland Wilkinson and Graham Wills (2008) <[doi:10.1198/106186008X320465](https://doi.org/10.1198/106186008X320465)> and association-based scagnostics described by Katrin Grimm (2016,ISBN:978-3-8439-3092-5) can be computed. Summary and plotting functions are provided.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**URL** <https://github.com/numbats/cassowaryr>

**BugReports** <https://github.com/numbats/cassowaryr/issues>

**Depends** R (>= 4.0.0)

**Imports** igraph, alphahull (>= 2.5), splanx, interp, energy, dplyr, ggplot2, magrittr, progress, tibble, stats, tidyselect

**RoxygenNote** 7.2.0

**Suggests** rmarkdown, knitr, mgcv, GGally, tidyr, testthat (>= 3.0.0), covr

**VignetteBuilder** knitr

**Config/testthat/edition** 3

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2022-08-09 12:30:02 UTC

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anscombe\_tidy

*Data from Anscombe's famous example in tidy format*


---

**Description**

All variables and pairs of variables have same summary statistics but are very different data, as can be seen by visualisation.

**Format**

A tibble with 44 observations and 3 variables

**set** label of the data set, each set has 11 observations

**x** variable for horizontal axis

**y** variable for vertical axis

---

calc_scags	<i>Compute selected scagnostics on subsets</i>
------------	--

---

**Description**

Compute selected scagnostics on subsets

**Usage**

```
calc_scags(  
  x,  
  y,  
  scags = c("outlying", "stringy", "striated", "striated2", "clumpy", "clumpy2",  
            "sparse", "skewed", "convex", "skinny", "monotonic", "splines", "dcor"),  
  out.rm = TRUE,  
  euclid = FALSE  
)
```

**Arguments**

x	numeric vector
y	numeric vector
scags	collection of strings matching names of scagnostics to calculate: outlying, stringy, striated, striated2, striped, clumpy, clumpy2, sparse, skewed, convex, skinny, monotonic, splines, dcor
out.rm	logical indicator to indicate if outliers should be removed before calculating non outlying measures
euclid	logical indicator to use Euclidean distance

**Value**

A data frame that gives the single plot's scagnostic score.

**See Also**

calc\_scags\_wide

**Examples**

```
# Calculate selected scagnostics on a single pair
calc_scags(anscombe$x1, anscombe$y1, scags=c("monotonic", "outlying"))

# Compute on long form data, or subsets
# defined by a categorical variable
require(dplyr)
datasaurus_dozen %>%
  group_by(dataset) %>%
  summarise(calc_scags(x,y, scags=c("monotonic", "outlying", "convex")))
```

---

calc_scags_wide	<i>Compute scagnostics on all possible scatter plots for the given data</i>
-----------------	---

---

**Description**

Compute scagnostics on all possible scatter plots for the given data

**Usage**

```
calc_scags_wide(
  all_data,
  scags = c("outlying", "stringy", "striated", "striated2", "clumpy", "clumpy2",
    "sparse", "skewed", "convex", "skinny", "monotonic", "splines", "dcor"),
  out.rm = TRUE,
  euclid = FALSE
)
```

**Arguments**

all_data	tibble of multivariate data on which to compute scagnostics
scags	collection of strings matching names of scagnostics to calculate: outlying, stringy, striated, striated2, striped, clumpy, clumpy2, sparse, skewed, convex, skinny, monotonic, splines, dcor
out.rm	logical indicator to indicate if outliers should be removed before calculating non outlying measures
euclid	logical indicator to use Euclidean distance

**Value**

A data frame that gives the data's scagnostic scores for each possible variable combination.

**See Also**

calc\_scags

**Examples**

```
# Calculate selected scagnostics
data(pk)
calc_scags_wide(pk[,2:5], scags=c("outlying", "monotonic"))
```

---

datasaurus_dozen	<i>datasaurus_dozen data</i>
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---

**Description**

From the datasauRus package. A modern update of Anscombe. All plots have same x and y mean, variance and correlation, but look different visually.

All variables and pairs of variables have same summary statistics but are very different data, as can be seen by visualisation.

**Format**

A tibble with 1,846 observations and 3 variables

**dataset** label of data set

**x** variable for horizontal axis

**y** variable for vertical axis

A tibble with 142 observations and 26 variables

**away\_x, away\_y** x and y variables for away data

**bullseye\_x, bullseye\_y** x and y variables for bullseye data

**circle\_x, circle\_y** x and y variables for circle data

**dino\_x, dino\_y** x and y variables for dino data

**dots\_x, dots\_y** x and y variables for dots data

**h\_lines\_x, h\_lines\_y** x and y variables for h\_lines data

**high\_lines\_x, high\_lines\_y** x and y variables for high\_lines data

**slant\_down\_x, slant\_down\_y** x and y variables for slant\_down data

**slant\_up\_x, slant\_up\_y** x and y variables for slant\_up data

**star\_x, star\_y** x and y variables for star data

**v\_lines\_x, v\_lines\_y** x and y variables for v\_lines data

**wide\_lines\_x, wide\_lines\_y** x and y variables for wide\_lines data

**star\_x, star\_y** x and y variables for star data

**x\_shape\_x, x\_shape\_y** x and y variables for x\_shape data

---

draw\_alphahull      *Drawing the alphahull*

---

**Description**

This function will draw the alphahull for a scatterplot.

**Usage**

```
draw_alphahull(x, y, alpha = 0.5, clr = "black", fill = FALSE, out.rm = TRUE)
```

**Arguments**

x	numeric vector
y	numeric vector
alpha	transparency value of points
clr	optional colour of points and lines, default black
fill	Fill the polygon
out.rm	option to return the outlier removed alphahull

**Value**

A `alphahull::ahull(del, alpha = alpha)` "gg" object that draws the plot's alpha hull.

**Examples**

```
require(dplyr)
require(ggplot2)
require(alphahull)
data("features")
nl <- features %>% filter(feature == "clusters")
draw_alphahull(nl$x, nl$y)
```

---

draw\_convexhull      *Drawing the Convex Hull*

---

**Description**

This function will draw the Convex Hull for a scatterplot.

**Usage**

```
draw_convexhull(x, y, alpha = 0.5, clr = "black", fill = FALSE, out.rm = TRUE)
```

**Arguments**

x	numeric vector
y	numeric vector
alpha	transparency value of points
clr	optional colour of points and lines, default black
fill	Fill the polygon
out.rm	option to return the outlier removed convex hull

**Value**

A "gg" object that draws the plot's convex hull.

**Examples**

```
require(dplyr)
require(ggplot2)
data("features")
nl <- features %>% filter(feature == "clusters")
draw_convexhull(nl$x, nl$y, fill=TRUE, out.rm=FALSE)
```

---

draw\_mst

*Drawing the MST*

---

**Description**

This function will draw the MST for a scatterplot.

**Usage**

```
draw_mst(x, y, alpha = 0.5, out.rm = TRUE)
```

**Arguments**

x	numeric vector
y	numeric vector
alpha	The alpha value used to build the graph object. Larger values allow points further apart to be connected.
out.rm	option to return the outlier removed MST

**Value**

A "gg" object that draws the plot's MST.

**Examples**

```
require(dplyr)
require(ggplot2)
data("features")
nl <- features %>% filter(feature == "nonlinear2")
draw_mst(nl$x, nl$y)
```

---

features	<i>Simulated data with special features</i>
----------	---

---

**Description**

Simulated data with common features that might be seen in 2D data. Variable are feature, x, y.

**Format**

A tibble with 1,013 observations and 3 variables, and 15 different patterns

**feature** label of data set

**x** variable for horizontal axis

**y** variable for vertical axis

---

numbat	<i>A toy data set with a numbat shape hidden among noise variables</i>
--------	--

---

**Description**

There are 7 variables (x1-x7) and 2,100 observations. Variables 4 and 7 have the numbat. The rest are noise. Group A has the numbat, and group B is all noise.

---

pk	<i>Parkinsons data from UCI machine learning archive</i>
----	--

---

**Description**

Biomedical voice measurements from 31 people, 23 with Parkinson's disease (PD). Each column in the table is a particular voice measure, and each row corresponds one of 195 voice recording from these individuals ("name" column). The main aim of the data is to discriminate healthy people from those with PD, according to "status" column which is set to 0 for healthy and 1 for PD.



**Format**

A tibble with 1,013 observations and 3 variables

**name** ASCII subject name and recording number

MDVP:Fo(Hz) Average vocal fundamental frequency

MDVP:Fhi(Hz) Maximum vocal fundamental frequency

MDVP:Flo(Hz) Minimum vocal fundamental frequency

MDVP:Jitter,MDVP:Jitter(Abs),MDVP:RAP,MDVP:PPQ,Jitter:DDP Several measures of variation in fundamental frequency

MDVP:Shimmer,MDVP:Shimmer(dB),Shimmer:APQ3,Shimmer:APQ5,MDVP:APQ,Shimmer:DDA Several measures of variation in amplitude

NHR,HNR Two measures of ratio of noise to tonal components in the voice

status Health status of the subject (one) - Parkinson's, (zero) - healthy

RPDE,D2 Two nonlinear dynamical complexity measures

DFA Signal fractal scaling exponent

spread1,spread2,PPE Three nonlinear measures of fundamental frequency variation

**Details**

The data is available at [The UCI Machine Learning Repository](#) in ASCII CSV format. The rows of the CSV file contain an instance corresponding to one voice recording. There are around six recordings per patient, the name of the patient is identified in the first column.

The data are originally analysed in: Max A. Little, Patrick E. McSharry, Eric J. Hunter, Lorraine O. Ramig (2008), 'Suitability of dysphonia measurements for telemonitoring of Parkinson's disease', IEEE Transactions on Biomedical Engineering.

---

scree	<i>Pre-processing to generate scagnostic measures</i>
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---

**Description**

Pre-processing to generate scagnostic measures

**Usage**

```
scree(x, y, binner = NULL, ...)
```

**Arguments**

x, y	numeric vectors
binner	an optional function that bins the x and y vectors prior to triangulation
...	other args

**Value**

An object of class "scree" that consists of three elements:

- del: the Delauney-Voronoi tessellation from `alphahull::delvor()`
- weights: the lengths of each edge in the Delauney triangulation
- alpha: the radius or alpha value that will be used to generate the alphahull

**Examples**

```
x <- runif(100)
y <- runif(100)
scree(x,y)
```

---

`sc_clumpy`*Compute clumpy scagnostic measure using MST*

---

**Description**

Compute clumpy scagnostic measure using MST

**Usage**

```
sc_clumpy(x, y)

## Default S3 method:
sc_clumpy(x, y)

## S3 method for class 'scree'
sc_clumpy(x, y = NULL)

## S3 method for class 'igraph'
sc_clumpy(x, y)
```

**Arguments**

x                    numeric vector of x values  
y                    numeric vector of y values

**Value**

A "numeric" object that gives the plot's clumpy score.

**Examples**

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(clumpy = sc_clumpy(x,y))
sc_clumpy(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

---

sc\_clumpy2

---

*Compute adjusted clumpy measure using MST*


---

**Description**

Compute adjusted clumpy measure using MST

**Usage**

```
sc_clumpy2(x, y)

## Default S3 method:
sc_clumpy2(x, y)

## S3 method for class 'screed'
sc_clumpy2(x, y = NULL)

## S3 method for class 'igraph'
sc_clumpy2(x, y)
```

**Arguments**

x                    numeric vector of x values  
y                    numeric vector of y values

**Value**

A "numeric" object that gives the plot's clumpy2 score.

**Examples**

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(clumpy = sc_clumpy2(x,y))
sc_clumpy2(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

---

`sc_clumpy_r`*Compute robust clumpy scagnostic measure using MST*

---

## Description

Compute robust clumpy scagnostic measure using MST

## Usage

```
sc_clumpy_r(x, y)

## Default S3 method:
sc_clumpy_r(x, y)

## S3 method for class 'screem'
sc_clumpy_r(x, y = NULL)

## S3 method for class 'igraph'
sc_clumpy_r(x, y)
```

## Arguments

<code>x</code>	numeric vector of x values
<code>y</code>	numeric vector of y values

## Value

A "numeric" object that gives the plot's robust clumpy score.

## Examples

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(clumpy = sc_clumpy_r(x,y))
sc_clumpy_r(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

---

sc_convex	<i>Compute convex scagnostic measure</i>
-----------	--

---

## Description

Compute convex scagnostic measure

## Usage

```
sc_convex(x, y)

## Default S3 method:
sc_convex(x, y)

## S3 method for class 'screed'
sc_convex(x, y = NULL)

## S3 method for class 'list'
sc_convex(x, y)
```

## Arguments

x	numeric vector of x values
y	numeric vector of y values

## Value

A "numeric" object that gives the plot's convex score.

## Examples

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(convex = sc_convex(x,y))
sc_convex(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

---

sc_dcor	<i>Distance correlation index.</i>
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---

### Description

(Taken from `tourr` package) Computes the distance correlation based index on 2D projections of the data.

### Usage

```
sc_dcor(x, y)
```

### Arguments

x	numeric vector
y	numeric vector

### Value

A "numeric" object that gives the plot's dcor score.

### Examples

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe)
anscombe_tidy <- anscombe %>%
  pivot_longer(cols = everything(),
    names_to = c(".value", "set"),
    names_pattern = "(.)(.)")
ggplot(anscombe_tidy, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_dcor(anscombe$x1, anscombe$y1)
sc_dcor(anscombe$x2, anscombe$y2)
sc_dcor(anscombe$x3, anscombe$y3)
sc_dcor(anscombe$x4, anscombe$y4)
```

---

sc_monotonic	<i>Measure of Spearman Correlation</i>
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---

**Description**

Measure of Spearman Correlation

**Usage**

```
sc_monotonic(x, y)
```

**Arguments**

x	numeric vector
y	numeric vector

**Value**

A "numeric" object that gives the plot's monotonic score.

**Examples**

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe)
anscombe_tidy <- anscombe %>%
  pivot_longer(cols = everything(),
    names_to = c(".value", "set"),
    names_pattern = "(.)(.)")
ggplot(anscombe_tidy, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_monotonic(anscombe$x1, anscombe$y1)
sc_monotonic(anscombe$x2, anscombe$y2)
sc_monotonic(anscombe$x3, anscombe$y3)
sc_monotonic(anscombe$x4, anscombe$y4)
```

---

sc_outlying	<i>Compute outlying scagnostoc measure using MST</i>
-------------	--

---

**Description**

Compute outlying scagnostoc measure using MST

**Usage**

```
sc_outlying(x, y)

## Default S3 method:
sc_outlying(x, y)

## S3 method for class 'scree'
sc_outlying(x, y = NULL)

## S3 method for class 'igraph'
sc_outlying(x, y)
```

**Arguments**

```
x          numeric vector of x values
y          numeric vector of y values
```

**Value**

A "numeric" object that gives the plot's outlying score.

**Examples**

```
require(ggplot2)
require(tidyr)
require(dplyr)
ggplot(datasaurus_dozen, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~dataset, ncol=3, scales = "free")
sc_outlying(datasaurus_dozen_wide$dino_x, datasaurus_dozen_wide$dino_y)
sc_outlying(datasaurus_dozen_wide$dots_x, datasaurus_dozen_wide$dots_y)
sc_outlying(datasaurus_dozen_wide$h_lines_x, datasaurus_dozen_wide$h_lines_y)
```

---

sc\_skewed

*Compute skewed scagnostic measure using MST*

---

**Description**

Compute skewed scagnostic measure using MST

**Usage**

```
sc_skewed(x, y)

## Default S3 method:
sc_skewed(x, y)
```



```
## S3 method for class 'scree'
sc_skewed(x, y = NULL)

## S3 method for class 'igraph'
sc_skewed(x, y)
```

### Arguments

x                    numeric vector of x values  
y                    numeric vector of y values

### Value

A "numeric" object that gives the plot's skewed score.

### Examples

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe_tidy)
ggplot(datasaurus_dozen, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~dataset, ncol=3, scales = "free")
sc_skewed(datasaurus_dozen_wide$dots_x, datasaurus_dozen_wide$dots_y)
sc_skewed(datasaurus_dozen_wide$h_lines_x, datasaurus_dozen_wide$h_lines_y)
sc_skewed(datasaurus_dozen_wide$x_shape_x, datasaurus_dozen_wide$x_shape_y)
```

---

sc\_skinny

*Compute skinny scagnostic measure*

---

### Description

Compute skinny scagnostic measure

### Usage

```
sc_skinny(x, y)

## Default S3 method:
sc_skinny(x, y)

## S3 method for class 'scree'
sc_skinny(x, y = NULL)

## S3 method for class 'list'
sc_skinny(x, y = NULL)
```

**Arguments**

x                    numeric vector of x values  
 y                    numeric vector of y values

**Value**

A "numeric" object that gives the plot's skinny score.

**Examples**

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(skinny = sc_skinny(x,y))
sc_skinny(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

---

 sc\_sparse

---

*Compute sparse scagnostic measure using MST*


---

**Description**

Compute sparse scagnostic measure using MST

**Usage**

```
sc_sparse(x, y)

## Default S3 method:
sc_sparse(x, y)

## S3 method for class 'screem'
sc_sparse(x, y = NULL)

## S3 method for class 'igraph'
sc_sparse(x, y)
```

**Arguments**

x                    numeric vector of x values  
 y                    numeric vector of y values

**Value**

A "numeric" object that gives the plot's sparse score.

**Examples**

```
require(ggplot2)
require(tidyr)
require(dplyr)
ggplot(datasaurus_dozen, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~dataset, ncol=3, scales = "free")
sc_sparse(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
sc_sparse(datasaurus_dozen_wide$circle_x, datasaurus_dozen_wide$circle_y)
sc_sparse(datasaurus_dozen_wide$dino_x, datasaurus_dozen_wide$dino_y)
```

---

sc\_sparse2

---

*Compute adjusted sparse measure using the alpha hull*


---

**Description**

Compute adjusted sparse measure using the alpha hull

**Usage**

```
sc_sparse2(x, y)

## Default S3 method:
sc_sparse2(x, y)

## S3 method for class 'scree'
sc_sparse2(x, y = NULL)

## S3 method for class 'list'
sc_sparse2(x, y = NULL)
```

**Arguments**

x                    numeric vector of x values  
y                    numeric vector of y values

**Value**

A "numeric" object that gives the plot's sparse2 score.

**Examples**

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe_tidy)
ggplot(anscombe_tidy, aes(x=x, y=y)) +
```

```
geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_sparse2(anscombe$x1, anscombe$y1)
```

---

sc\_splines

*Spline based index.*


---

### Description

(Taken from tourr git repo) Compares the variance in residuals of a fitted spline model to the overall variance to find functional dependence in 2D projections of the data.

### Usage

```
sc_splines(x, y)
```

### Arguments

x	numeric vector
y	numeric vector

### Value

A "numeric" object that gives the plot's spines score.

### Examples

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe)
anscombe_tidy <- anscombe %>%
  pivot_longer(cols = everything(),
    names_to = c(".value", "set"),
    names_pattern = "(.)(.)")
ggplot(anscombe_tidy, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_splines(anscombe$x1, anscombe$y1)
sc_splines(anscombe$x2, anscombe$y2)
sc_splines(anscombe$x3, anscombe$y3)
```

---

sc_striated	<i>Compute striated scagnostic measure using MST</i>
-------------	--

---

### Description

Compute striated scagnostic measure using MST

### Usage

```
sc_striated(x, y)

## Default S3 method:
sc_striated(x, y)

## S3 method for class 'scree'
sc_striated(x, y = NULL)

## S3 method for class 'igraph'
sc_striated(x, y)
```

### Arguments

x	numeric vector of x values
y	numeric vector of y values

### Value

A "numeric" object that gives the plot's striated score.

### Examples

```
require(ggplot2)
require(dplyr)
data(anscombe_tidy)
ggplot(anscombe_tidy, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_striated(anscombe$x1, anscombe$y1)
sc_striated(anscombe$x2, anscombe$y2)
```

---

sc_striated2	<i>Compute angle adjusted striated measure using MST</i>
--------------	--

---

## Description

Compute angle adjusted striated measure using MST

## Usage

```
sc_striated2(x, y)

## Default S3 method:
sc_striated2(x, y)

## S3 method for class 'screep'
sc_striated2(x, y = NULL)

## S3 method for class 'igraph'
sc_striated2(x, y)
```

## Arguments

x	numeric vector of x values, or an MST object
y	numeric vector of y values, or a screep object

## Value

A "numeric" object that gives the plot's striated2 score.

## Examples

```
require(ggplot2)
require(dplyr)
ggplot(features, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~feature, ncol = 5, scales = "free")
features %>% group_by(feature) %>% summarise(striated = sc_striated2(x,y))
sc_striated2(datasaurus_dozen_wide$away_x, datasaurus_dozen_wide$away_y)
```

**Description**

Compute stringy scagnostic measure using MST

**Usage**

```
sc_stringy(x, y)

## Default S3 method:
sc_stringy(x, y)

## S3 method for class 'screem'
sc_stringy(x, y = NULL)

## S3 method for class 'igraph'
sc_stringy(x, y = NULL)
```

**Arguments**

x	numeric vector of x values
y	numeric vector of y values

**Value**

A "numeric" object that gives the plot's stringy score.

**Examples**

```
require(ggplot2)
require(tidyr)
require(dplyr)
data(anscombe_tidy)
ggplot(anscombe_tidy, aes(x=x, y=y)) +
  geom_point() +
  facet_wrap(~set, ncol=2, scales = "free")
sc_stringy(anscombe$x1, anscombe$y1)
sc_stringy(anscombe$x2, anscombe$y2)
sc_stringy(anscombe$x3, anscombe$y3)
sc_stringy(anscombe$x4, anscombe$y4)
```

---

sc_stripped	<i>Measure of Discreteness</i>
-------------	--------------------------------

---

**Description**

This metric computes the 1-(ratio between the number of unique values to total data values) on number of rotations of the data, and returns the smallest value. If this value is large it means that there are only a few unique data values, and hence the distribution is discrete

**Usage**

```
sc_stripped(x, y)
```

**Arguments**

x	numeric vector
y	numeric vector

**Value**

double

**Examples**

```
data("datasaurus_dozen_wide")
sc_stripped(datasaurus_dozen_wide$v_lines_x,
            datasaurus_dozen_wide$v_lines_y)
sc_stripped(datasaurus_dozen_wide$dino_x,
            datasaurus_dozen_wide$dino_y)
```

---

top_pairs	<i>Calculate the top scagnostic for each pair of variables</i>
-----------	--

---

**Description**

Calculate the top scagnostic for each pair of variables

**Usage**

```
top_pairs(scags_data)
```

**Arguments**

scags_data	A dataset of scagnostic values that was returned by calc_scags or calc_scags_wide
------------	---



**Value**

A data frame where each row is a each scatter plot, its highest valued scagnostic, and its respective value

**See Also**

calc\_scags calc\_scags\_wide top\_scags

**Examples**

```
#an example using calc_scags
require(dplyr)
datasaurus_dozen %>%
  group_by(dataset) %>%
  summarise(calc_scags(x,y, scags=c("monotonic", "outlying", "convex"))) %>%
  top_pairs()
#an example using calc_scags_wide
data(pk)
scags_data <- calc_scags_wide(pk[,2:5], scags=c("outlying","clumpy","monotonic"))
top_pairs(scags_data)
```

---

top\_scags

---

*Calculate the top pair of variables or group for each scagnostic*


---

**Description**

Calculate the top pair of variables or group for each scagnostic

**Usage**

```
top_scags(scags_data)
```

**Arguments**

scags\_data      A dataset of scagnostic values that was returned by calc\_scags or calc\_scags\_wide

**Value**

A data frame where each row is a scagnostic with its highest pair and the associated value

**See Also**

calc\_scags calc\_scags\_wide top\_pairs

**Examples**

```
#an example using calc_scags
require(dplyr)
datasaurus_dozen %>%
  group_by(dataset) %>%
  summarise(calc_scags(x,y, scags=c("monotonic", "outlying", "convex"))) %>%
  top_scags()
#an example using calc_scags_wide
data(pk)
scags_data <- calc_scags_wide(pk[,2:5], scags=c("outlying", "clumpy", "monotonic"))
top_scags(scags_data)
```

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