

Package ‘VennDiagram’

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Type Package

Title Generate High-Resolution Venn and Euler Plots

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Imports methods

Depends R (>= 3.5.0), grid (>= 2.14.1), futile.logger

Description A set of functions to generate high-resolution Venn and Euler plots. Includes handling for several special cases, including two-case scaling, and extensive customization of plot shape and structure.

License GPL-2

LazyLoad yes

Suggests testthat

NeedsCompilation no

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VennDiagram-package *Venn diagram plotting*

Description

Functions to plot high-resolution and highly-customizable Venn and Euler plots.

Details

Package: VennDiagram
Type: Package
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LazyLoad: yes

Author(s)

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calculate.overlap *Calculate Overlap*

Description

Determine the groupings of values as they would be presented in the venn diagram.

Usage

```
calculate.overlap(x)
```

Arguments

x A list of vectors (e.g., integers, chars), with each component corresponding to a separate circle in the Venn diagram

Details

This function mostly complements the `venn.diagram()` function for the case where users want to know what values are grouped into the particular areas of the venn diagram.

Value

Returns a list of lists which contain the values assigned to each of the areas of a venn diagram.

Author(s)

Christopher Lalansingh

Examples

```
# A simple single-set diagram
cardiome <- letters[1:10]
superset <- letters[8:24]
overlap <- calculate.overlap(
  x = list(
    "Cardiome" = cardiome,
    "SuperSet" = superset
  )
);
```

draw.pairwise.venn *Draw a Venn Diagram with Two Sets*

Description

Creates a Venn diagram with two sets. Creates Euler diagrams when the dataset meets certain conditions.

Usage

```
draw.pairwise.venn(area1, area2, cross.area, category = rep("", 2),
  euler.d = TRUE, scaled = TRUE, inverted = FALSE,
  ext.text = TRUE, ext.percent = rep(0.05, 3), lwd =
  rep(2, 2), lty = rep("solid", 2), col = rep("black",
  2), fill = NULL, alpha = rep(0.5, 2), label.col =
  rep("black", 3), cex = rep(1, 3), fontface =
  rep("plain", 3), fontfamily = rep("serif", 3), cat.pos
  = c(-50, 50), cat.dist = rep(0.025, 2), cat.cex =
  rep(1, 2), cat.col = rep("black", 2), cat.fontface =
  rep("plain", 2), cat.fontfamily = rep("serif", 2),
  cat.just = rep(list(c(0.5, 0.5)), 2), cat.default.pos
  = "outer", cat.prompts = FALSE, ext.pos = rep(0, 2),
  ext.dist = rep(0, 2), ext.line.lty = "solid",
  ext.length = rep(0.95, 2), ext.line.lwd = 1,
  rotation.degree = 0, rotation.centre = c(0.5, 0.5),
  ind = TRUE, sep.dist = 0.05, offset = 0, cex.prop =
  NULL, print.mode = "raw", sigdigs = 3, ...)
```

Arguments

| | |
|------------------------------|---|
| <code>area1</code> | The size of the first set |
| <code>area2</code> | The size of the second set |
| <code>cross.area</code> | The size of the intersection between the sets |
| <code>category</code> | A vector (length 2) of strings giving the category names of the sets |
| <code>euler.d</code> | Boolean indicating whether to draw Euler diagrams when conditions are met or not (Venn Diagrams with moveable circles) |
| <code>scaled</code> | Boolean indicating whether to scale circle sizes in the diagram according to set sizes or not (euler.d must be true to enable this) |
| <code>inverted</code> | Boolean indicating whether the diagram should be mirrored long the vertical axis or not |
| <code>ext.text</code> | Boolean indicating whether to place area labels outside the circles in case of small partial areas or not |
| <code>ext.percent</code> | A vector (length 3) indicating the proportion that a partial area has to be smaller than to trigger external text placement. The elements allow for individual control of the areas in the order of <code>area1</code> , <code>area2</code> and <code>intersect.area</code> . |
| <code>lwd</code> | A vector (length 2) of numbers giving the line width of the circles' circumferences |
| <code>lty</code> | A vector (length 2) giving the line dash pattern of the circles' circumferences |
| <code>col</code> | A vector (length 2) giving the colours of the circles' circumferences |
| <code>fill</code> | A vector (length 2) giving the colours of the circles' areas |
| <code>alpha</code> | A vector (length 2) giving the alpha transparency of the circles' areas |
| <code>label.col</code> | A vector (length 3) giving the colours of the areas' labels |
| <code>cex</code> | A vector (length 3) giving the size of the areas' labels |
| <code>fontface</code> | A vector (length 3) giving the fontface of the areas' labels |
| <code>fontfamily</code> | A vector (length 3) giving the fontfamily of the areas' labels |
| <code>cat.pos</code> | A vector (length 2) giving the positions (in degrees) of the category names along the circles, with 0 (default) at the 12 o'clock location |
| <code>cat.dist</code> | A vector (length 2) giving the distances (in npc units) of the category names from the edges of the circles (can be negative) |
| <code>cat.cex</code> | A vector (length 2) giving the size of the category names |
| <code>cat.col</code> | A vector (length 2) giving the colours of the category names |
| <code>cat.fontface</code> | A vector (length 2) giving the fontface of the category names |
| <code>cat.fontfamily</code> | A vector (length 2) giving the fontfamily of the category names |
| <code>cat.just</code> | List of 2 vectors of length 2 indicating horizontal and vertical justification of each category name |
| <code>cat.default.pos</code> | One of c('outer', 'text') to specify the default location of category names (<code>cat.pos</code> and <code>cat.dist</code> are handled differently) |

| | |
|-----------------|--|
| cat.prompts | Boolean indicating whether to display help text on category name positioning or not) |
| ext.pos | A vector (length 1 or 2) giving the positions (in degrees) of the external area labels along the circles, with 0 (default) at 12 o'clock |
| ext.dist | A vector (length 1 or 2) giving how far to place the external area labels relative to its anchor point |
| ext.line.lty | A vector (length 1 or 2) giving the dash pattern of the lines connecting the external area labels to their anchor points |
| ext.length | A vector (length 1 or 2) giving the proportion of the lines connecting the external area labels to their anchor points actually drawn |
| ext.line.lwd | A vector (length 1 or 2) giving the width of the lines connecting the external area labels to their anchor points |
| rotation.degree | Number of degrees to rotate the entire diagram |
| rotation.centre | A vector (length 2) indicating (x,y) of the rotation centre |
| ind | Boolean indicating whether the function is to automatically draw the diagram before returning the gList object or not |
| sep.dist | Number giving the distance between circles in case of an Euler diagram showing mutually exclusive sets |
| offset | Number between 0 and 1 giving the amount of offset from the centre in case of an Euler diagram showing inclusive sets |
| cex.prop | A function or string used to rescale areas |
| print.mode | Can be either 'raw' or 'percent'. This is the format that the numbers will be printed in. Can pass in a vector with the second element being printed under the first |
| sigdigs | If one of the elements in print.mode is 'percent', then this is how many significant digits will be kept |
| ... | Additional arguments to be passed, including margin, which indicates amount of whitespace around the final diagram in npc units |

Details

Euler diagrams are drawn for mutually exclusive sets (`cross.area == 0`), inclusive sets (`area1 == 0` or `area2 == 0`), and coincidental sets (`area1 == 0` and `area2 == 0`) if `euler.d == TRUE`. The function defaults to placing the larger set on the left. `inverted` or `rotation.degree` can be used to reverse this.

Value

Returns an object of class `gList` containing the grid objects that make up the diagram. Also displays the diagram in a graphical device unless specified with `ind = FALSE`. `Grid::grid.draw` can be used to draw the `gList` object in a graphical device.

Author(s)

Hanbo Chen

Examples

```
# A simple two-set diagram
venn.plot <- draw.pairwise.venn(100, 70, 30, c("First", "Second"));
grid.draw(venn.plot);
grid.newpage();

# Same diagram as above, but without scaling
venn.plot <- draw.pairwise.venn(100, 70, 30, c("First", "Second"), scaled = FALSE);
grid.draw(venn.plot);
grid.newpage();

# A more complicated diagram Demonstrating external area labels
venn.plot <- draw.pairwise.venn(
  area1 = 100,
  area2 = 70,
  cross.area = 68,
  category = c("First", "Second"),
  fill = c("blue", "red"),
  lty = "blank",
  cex = 2,
  cat.cex = 2,
  cat.pos = c(285, 105),
  cat.dist = 0.09,
  cat.just = list(c(-1, -1), c(1, 1)),
  ext.pos = 30,
  ext.dist = -0.05,
  ext.length = 0.85,
  ext.line.lwd = 2,
  ext.line.lty = "dashed"
);
grid.draw(venn.plot);
grid.newpage();

# Demonstrating an Euler diagram
venn.plot <- draw.pairwise.venn(
  area1 = 100,
  area2 = 70,
  cross.area = 0,
  category = c("First", "Second"),
  cat.pos = c(0, 180),
  euler.d = TRUE,
  sep.dist = 0.03,
  rotation.degree = 45
);

# Writing to file
tiff(
  filename = tempfile(
```

```

        pattern = 'Pairwise_Venn_diagram',
        fileext = '.tiff'
    ),
    compression = "lzw");

grid.draw(venn.plot);
dev.off();

```

draw.quad.venn

Draw a Venn Diagram with Four Sets

Description

Creates a Venn diagram with four sets.

Usage

```

draw.quad.venn(area1, area2, area3, area4, n12, n13, n14, n23, n24,
  n34, n123, n124, n134, n234, n1234, category = rep("",
  4), lwd = rep(2, 4), lty = rep("solid", 4), col =
  rep("black", 4), fill = NULL, alpha = rep(0.5, 4),
  label.col = rep("black", 15), cex = rep(1, 15),
  fontface = rep("plain", 15), fontfamily = rep("serif",
  15), cat.pos = c(-15, 15, 0, 0), cat.dist = c(0.22,
  0.22, 0.11, 0.11), cat.col = rep("black", 4), cat.cex
  = rep(1, 4), cat.fontface = rep("plain", 4),
  cat.fontfamily = rep("serif", 4), cat.just =
  rep(list(c(0.5, 0.5)), 4), rotation.degree = 0,
  rotation.centre = c(0.5, 0.5), ind = TRUE, cex.prop =
  NULL, print.mode = "raw", sigdigs = 3, direct.area =
  FALSE, area.vector = 0, ...)

```

Arguments

| | |
|-------|---|
| area1 | The size of the first set |
| area2 | The size of the second set |
| area3 | The size of the third set |
| area4 | The size of the fourth set |
| n12 | The size of the intersection between the first and the second set |
| n13 | The size of the intersection between the first and the third set |
| n14 | The size of the intersection between the first and the fourth set |
| n23 | The size of the intersection between the second and the third set |
| n24 | The size of the intersection between the second and the fourth set |
| n34 | The size of the intersection between the third and the fourth set |
| n123 | The size of the intersection between the first, second and third sets |

| | |
|------------------------------|---|
| <code>n124</code> | The size of the intersection between the first, second and fourth sets |
| <code>n134</code> | The size of the intersection between the first, third and fourth sets |
| <code>n234</code> | The size of the intersection between the second, third and fourth sets |
| <code>n1234</code> | The size of the intersection between all four sets |
| <code>category</code> | A vector (length 4) of strings giving the category names of the sets |
| <code>lwd</code> | A vector (length 4) of numbers giving the line width of the circles' circumferences |
| <code>lty</code> | A vector (length 4) giving the dash pattern of the circles' circumferences |
| <code>col</code> | A vector (length 4) giving the colours of the circles' circumferences |
| <code>fill</code> | A vector (length 4) giving the colours of the circles' areas |
| <code>alpha</code> | A vector (length 4) giving the alpha transparency of the circles' areas |
| <code>label.col</code> | A vector (length 15) giving the colours of the areas' labels |
| <code>cex</code> | A vector (length 15) giving the size of the areas' labels |
| <code>fontface</code> | A vector (length 15) giving the fontface of the areas' labels |
| <code>fontfamily</code> | A vector (length 15) giving the fontfamily of the areas' labels |
| <code>cat.pos</code> | A vector (length 4) giving the positions (in degrees) of the category names along the circles, with 0 (default) at 12 o'clock |
| <code>cat.dist</code> | A vector (length 4) giving the distances (in npc units) of the category names from the edges of the circles (can be negative) |
| <code>cat.cex</code> | A vector (length 4) giving the size of the category names |
| <code>cat.col</code> | A vector (length 4) giving the colours of the category names |
| <code>cat.fontface</code> | A vector (length 4) giving the fontface of the category names |
| <code>cat.fontfamily</code> | A vector (length 4) giving the fontfamily of the category names |
| <code>cat.just</code> | List of 4 vectors of length 2 indicating horizontal and vertical justification of each category name |
| <code>rotation.degree</code> | Number of degrees to rotate the entire diagram |
| <code>rotation.centre</code> | A vector (length 2) indicating (x,y) of the rotation centre |
| <code>ind</code> | Boolean indicating whether the function is to automatically draw the diagram before returning the gList object or not |
| <code>cex.prop</code> | A function or string used to rescale areas |
| <code>print.mode</code> | Can be either 'raw' or 'percent'. This is the format that the numbers will be printed in. Can pass in a vector with the second element being printed under the first |
| <code>sigdigs</code> | If one of the elements in print.mode is 'percent', then this is how many significant digits will be kept |
| <code>direct.area</code> | If this is equal to true, then the vector passed into area.vector will be directly assigned to the areas of the corresponding regions. Only use this if you know which positions in the vector correspond to which regions in the diagram |
| <code>area.vector</code> | An argument to be used when direct.area is true. These are the areas of the corresponding regions in the Venn Diagram |
| <code>...</code> | Additional arguments to be passed, including margin, which indicates amount of whitespace around the final diagram in npc units |

Details

The function defaults to placing the ellipses so that area1 corresponds to lower left, area2 corresponds to lower right, area3 corresponds to middle left and area4 corresponds to middle right. Refer to the example below to see how the 31 partial areas are ordered. Arguments with length of 15 (label.col, cex, fontface, fontfamily) will follow the order in the example.

Value

Returns an object of class gList containing the grid objects that make up the diagram. Also displays the diagram in a graphical device unless specified with ind = FALSE. Grid::grid.draw can be used to draw the gList object in a graphical device.

Author(s)

Hanbo Chen

Examples

```
# Reference four-set diagram
venn.plot <- draw.quad.venn(
  area1 = 72,
  area2 = 86,
  area3 = 50,
  area4 = 52,
  n12 = 44,
  n13 = 27,
  n14 = 32,
  n23 = 38,
  n24 = 32,
  n34 = 20,
  n123 = 18,
  n124 = 17,
  n134 = 11,
  n234 = 13,
  n1234 = 6,
  category = c("First", "Second", "Third", "Fourth"),
  fill = c("orange", "red", "green", "blue"),
  lty = "dashed",
  cex = 2,
  cat.cex = 2,
  cat.col = c("orange", "red", "green", "blue")
);

# Writing to file
tiff(
  filename = tempfile(
    pattern = 'Quad_Venn_diagram',
    fileext = '.tiff'
  ),
  compression = "lzw"
);
```

```
grid.draw(venn.plot);
dev.off();
```

draw.quintuple.venn *Draw a Venn Diagram with Five Sets*

Description

Creates a Venn diagram with five sets.

Usage

```
draw.quintuple.venn(area1, area2, area3, area4, area5, n12, n13, n14, n15,
  n23, n24, n25, n34, n35, n45, n123, n124, n125, n134,
  n135, n145, n234, n235, n245, n345, n1234, n1235,
  n1245, n1345, n2345, n12345, category = rep("", 5),
  lwd = rep(2, 5), lty = rep("solid", 5), col =
  rep("black", 5), fill = NULL, alpha = rep(0.5, 5),
  label.col = rep("black", 31), cex = rep(1, 31),
  fontface = rep("plain", 31), fontfamily = rep("serif",
  31), cat.pos = c(0, 287.5, 215, 145, 70), cat.dist =
  rep(0.2, 5), cat.col = rep("black", 5), cat.cex =
  rep(1, 5), cat.fontface = rep("plain", 5),
  cat.fontfamily = rep("serif", 5), cat.just =
  rep(list(c(0.5, 0.5)), 5), rotation.degree = 0,
  rotation.centre = c(0.5, 0.5), ind = TRUE, cex.prop =
  NULL, print.mode = "raw", sigdigs = 3, direct.area =
  FALSE, area.vector = 0, ...)
```

Arguments

| | |
|-------|--|
| area1 | The size of the first set |
| area2 | The size of the second set |
| area3 | The size of the third set |
| area4 | The size of the fourth set |
| area5 | The size of the fifth set |
| n12 | The size of the intersection between the first and the second set |
| n13 | The size of the intersection between the first and the third set |
| n14 | The size of the intersection between the first and the fourth set |
| n15 | The size of the intersection between the first and the fifth set |
| n23 | The size of the intersection between the second and the third set |
| n24 | The size of the intersection between the second and the fourth set |
| n25 | The size of the intersection between the second and the fifth set |

| | |
|----------------|---|
| n34 | The size of the intersection between the third and the fourth set |
| n35 | The size of the intersection between the third and the fifth set |
| n45 | The size of the intersection between the fourth and the fifth set |
| n123 | The size of the intersection between the first, second and third sets |
| n124 | The size of the intersection between the first, second and fourth sets |
| n125 | The size of the intersection between the first, second and fifth sets |
| n134 | The size of the intersection between the first, third and fourth sets |
| n135 | The size of the intersection between the first, third and fifth sets |
| n145 | The size of the intersection between the first, fourth and fifth sets |
| n234 | The size of the intersection between the second, third and fourth sets |
| n235 | The size of the intersection between the second, third and fifth sets |
| n245 | The size of the intersection between the second, fourth and fifth sets |
| n345 | The size of the intersection between the third, fourth and fifth sets |
| n1234 | The size of the intersection between the first, second, third and fourth sets |
| n1235 | The size of the intersection between the first, second, third and fifth sets |
| n1245 | The size of the intersection between the first, second, fourth and fifth sets |
| n1345 | The size of the intersection between the first, third, fourth and fifth sets |
| n2345 | The size of the intersection between the second, third, fourth and fifth sets |
| n12345 | The size of the intersection between all five sets |
| category | A vector (length 5) of strings giving the category names of the sets |
| lwd | A vector (length 5) of numbers giving the line width of the circles' circumferences |
| lty | A vector (length 5) giving the dash pattern of the circles' circumferences |
| col | A vector (length 5) giving the colours of the circles' circumferences |
| fill | A vector (length 5) giving the colours of the circles' areas |
| alpha | A vector (length 5) giving the alpha transparency of the circles' areas |
| label.col | A vector (length 31) giving the colours of the areas' labels |
| cex | A vector (length 31) giving the size of the areas' labels |
| fontface | A vector (length 31) giving the fontface of the areas' labels |
| fontfamily | A vector (length 31) giving the fontfamily of the areas' labels |
| cat.pos | A vector (length 5) giving the positions (in degrees) of the category names along the circles, with 0 (default) at 12 o'clock |
| cat.dist | A vector (length 5) giving the distances (in npc units) of the category names from the edges of the circles (can be negative) |
| cat.cex | A vector (length 5) giving the size of the category names |
| cat.col | A vector (length 5) giving the colours of the category names |
| cat.fontface | A vector (length 5) giving the fontface of the category names |
| cat.fontfamily | A vector (length 5) giving the fontfamily of the category names |

| | |
|------------------------------|---|
| <code>cat.just</code> | List of 5 vectors of length 2 indicating horizontal and vertical justification of each category name |
| <code>rotation.degree</code> | Number of degrees to rotate the entire diagram |
| <code>rotation.centre</code> | A vector (length 2) indicating (x,y) of the rotation centre |
| <code>ind</code> | Boolean indicating whether the function is to automatically draw the diagram before returning the gList object or not |
| <code>cex.prop</code> | A function or string used to rescale areas |
| <code>print.mode</code> | Can be either 'raw' or 'percent'. This is the format that the numbers will be printed in. Can pass in a vector with the second element being printed under the first |
| <code>sigdigs</code> | If one of the elements in print.mode is 'percent', then this is how many significant digits will be kept |
| <code>direct.area</code> | If this is equal to true, then the vector passed into area.vector will be directly assigned to the areas of the corresponding regions. Only use this if you know which positions in the vector correspond to which regions in the diagram |
| <code>area.vector</code> | An argument to be used when direct.area is true. These are the areas of the corresponding regions in the Venn Diagram |
| <code>...</code> | Additional arguments to be passed, including <code>margin</code> , which indicates amount of whitespace around the final diagram in npc units |

Details

The function defaults to placing the ellipses representing the areas 1 to 5 in a counterclockwise fashion. Refer to the example below to see how the 31 partial areas are ordered. Arguments with length of 31 (`label.col`, `cex`, `fontface`, `fontfamily`) will follow the order in the example.

Value

Returns an object of class `gList` containing the grid objects that make up the diagram. Also displays the diagram in a graphical device unless specified with `ind = FALSE`. `Grid::grid.draw` can be used to draw the `gList` object in a graphical device.

Author(s)

Hanbo Chen

Examples

```
# Reference five-set diagram
venn.plot <- draw.quintuple.venn(
  area1 = 301,
  area2 = 321,
  area3 = 311,
  area4 = 321,
  area5 = 301,
```

```

n12 = 188,
n13 = 191,
n14 = 184,
n15 = 177,
n23 = 194,
n24 = 197,
n25 = 190,
n34 = 190,
n35 = 173,
n45 = 186,
n123 = 112,
n124 = 108,
n125 = 108,
n134 = 111,
n135 = 104,
n145 = 104,
n234 = 111,
n235 = 107,
n245 = 110,
n345 = 100,
n1234 = 61,
n1235 = 60,
n1245 = 59,
n1345 = 58,
n2345 = 57,
n12345 = 31,
category = c("A", "B", "C", "D", "E"),
fill = c("dodgerblue", "goldenrod1", "darkorange1", "seagreen3", "orchid3"),
cat.col = c("dodgerblue", "goldenrod1", "darkorange1", "seagreen3", "orchid3"),
cat.cex = 2,
margin = 0.05,
cex = c(1.5, 1.5, 1.5, 1.5, 1.5, 1, 0.8, 1, 0.8, 1, 0.8, 1, 0.8, 1, 0.8,
1, 0.55, 1, 0.55, 1, 0.55, 1, 0.55, 1, 0.55, 1, 1, 1, 1, 1, 1.5),
ind = TRUE
);

# Writing to file
tiff(
  filename = tempfile(
    pattern = 'Quintuple_Venn_diagram',
    fileext = '.tiff'
  ),
  compression = "lzw"
);

grid.draw(venn.plot);
dev.off();

```

Description

Creates a Venn diagram with a single set.

Usage

```
draw.single.venn(area, category = "", lwd = 2, lty = "solid", col = "black", fill = NULL,
alpha = 0.5, label.col = "black", cex = 1,
fontface = "plain", fontfamily = "serif",
cat.pos = 0, cat.dist = 0.025, cat.cex = 1, cat.col = "black",
cat.fontface = "plain", cat.fontfamily = "serif",
cat.just = list(c(0.5, 0.5)),
cat.default.pos = "outer", cat.prompts = FALSE, rotation.degree = 0,
rotation.centre = c(0.5, 0.5), ind = TRUE, ...)
```

Arguments

| | |
|-----------------|--|
| area | The size of the set |
| category | The category name of the set |
| lwd | width of the circle's circumference |
| lty | dash pattern of the circle's circumference |
| col | Colour of the circle's circumference |
| fill | Colour of the circle's area |
| alpha | Alpha transparency of the circle's area |
| label.col | Colour of the area label |
| cex | size of the area label |
| fontface | fontface of the area label |
| fontfamily | fontfamily of the area label |
| cat.pos | The position (in degrees) of the category name along the circle, with 0 (default) at 12 o'clock |
| cat.dist | The distance (in npc units) of the category name from the edge of the circle (can be negative) |
| cat.cex | size of the category name |
| cat.col | Colour of the category name |
| cat.fontface | fontface of the category name |
| cat.fontfamily | fontfamily of the category name |
| cat.just | List of 1 vector of length 2 indicating horizontal and vertical justification of the category name |
| cat.default.pos | One of c('outer', 'text') to specify the default location of category names (cat.pos and cat.dist are handled differently) |
| cat.prompts | Boolean indicating whether to display help text on category name positioning or not) |

| | |
|-----------------|---|
| rotation.degree | Number of degrees to rotate the entire diagram |
| rotation.centre | A vector (length 2) indicating (x,y) of the rotation centre |
| ind | Boolean indicating whether the function is to automatically draw the diagram in the end or not |
| ... | Additional arguments to be passed, including margin, which indicates amount of whitespace around the final diagram in npc units |

Details

This function mostly complements other functions in the VennDiagram package that draws multi-set diagrams by providing a function that draws single-set diagrams with similar graphical options.

Value

Returns an object of class gList containing the grid objects that make up the diagram. Also displays the diagram in a graphical device unless specified with ind = FALSE. Grid::grid.draw can be used to draw the gList object in a graphical device.

Author(s)

Hanbo Chen

Examples

```
# A simple single-set diagram
venn.plot <- draw.single.venn(100, "First");
grid.draw(venn.plot);
grid.newpage();

# A more complicated diagram
venn.plot <- draw.single.venn(
  area = 365,
  category = "All\nDays",
  lwd = 5,
  lty = "blank",
  cex = 3,
  label.col = "orange",
  cat.cex = 4,
  cat.pos = 180,
  cat.dist = -0.20,
  cat.col = "white",
  fill = "red",
  alpha = 0.15
);
grid.draw(venn.plot);
grid.newpage();

# Writing to file
tiff(
```

```

filename = tempfile(
  pattern = 'Single_Venn_diagram',
  fileext = '.tiff'
),
compression = "lzw"
);

venn.plot <- draw.single.venn(100, "First", ind = FALSE);
grid.draw(venn.plot);
dev.off();

```

draw.triple.venn

Draw a Venn Diagram with Three Sets

Description

Creates a Venn diagram with three sets. Creates Euler diagrams when the dataset meets certain conditions.

Usage

```

draw.triple.venn(area1, area2, area3, n12, n23, n13, n123, category =
  rep("", 3), rotation = 1, reverse = FALSE, euler.d =
  TRUE, scaled = TRUE, lwd = rep(2, 3), lty =
  rep("solid", 3), col = rep("black", 3), fill = NULL,
  alpha = rep(0.5, 3), label.col = rep("black", 7), cex
  = rep(1, 7), fontface = rep("plain", 7), fontfamily =
  rep("serif", 7), cat.pos = c(-40, 40, 180), cat.dist =
  c(0.05, 0.05, 0.025), cat.col = rep("black", 3),
  cat.cex = rep(1, 3), cat.fontface = rep("plain", 3),
  cat.fontfamily = rep("serif", 3), cat.just =
  list(c(0.5, 1), c(0.5, 1), c(0.5, 0)), cat.default.pos
  = "outer", cat.prompts = FALSE, rotation.degree = 0,
  rotation.centre = c(0.5, 0.5), ind = TRUE, sep.dist =
  0.05, offset = 0, cex.prop = NULL, print.mode = "raw",
  sigdigs = 3, direct.area = FALSE, area.vector = 0,
  ...)

```

Arguments

| | |
|-------|---|
| area1 | The size of the first set |
| area2 | The size of the second set |
| area3 | The size of the third set |
| n12 | The size of the intersection between the first and the second set |
| n23 | The size of the intersection between the second and the third set |
| n13 | The size of the intersection between the first and the third set |

| | |
|-----------------|--|
| n123 | The size of the intersection between all three sets |
| category | A vector (length 3) of strings giving the category names of the sets |
| rotation | 1 (default), 2, or 3 indicating clockwise rotation of the three sets from the default arrangement |
| reverse | Boolean indicating whether the diagram should be mirrored long the vertical axis or not |
| euler.d | Boolean indicating whether to draw Euler diagrams when conditions are met or not (Venn Diagrams with moveable circles) |
| scaled | Boolean indicating whether to scale circle sizes in certain Euler diagrams according to set sizes or not (euler.d must be true to enable this) |
| lwd | A vector (length 3) of numbers giving the width of the circles' circumferences |
| lty | A vector (length 3) giving the dash pattern of the circles' circumferences |
| col | A vector (length 3) giving the colours of the circles' circumferences |
| fill | A vector (length 3) giving the colours of the circles' areas |
| alpha | A vector (length 3) giving the alpha transparency of the circles' areas |
| label.col | A vector (length 7) giving the colours of the areas' labels |
| cex | A vector (length 7) giving the size of the areas' labels |
| fontface | A vector (length 7) giving the fontface of the areas' labels |
| fontfamily | A vector (length 7) giving the fontfamily of the areas' labels |
| cat.pos | A vector (length 3) giving the positions (in degrees) of the category names along the circles, with 0 (default) at 12 o'clock |
| cat.dist | A vector (length 3) giving the distances (in npc units) of the category names from the edges of the circles (can be negative) |
| cat.cex | A vector (length 3) giving the size of the category names |
| cat.col | A vector (length 3) giving the colours of the category names |
| cat.fontface | A vector (length 3) giving the fontface of the category names |
| cat.fontfamily | A vector (length 3) giving the fontfamily of the category names |
| cat.just | List of 3 vectors of length 2 indicating horizontal and vertical justification of each category name |
| cat.default.pos | One of c('outer', 'text') to specify the default location of category names (cat.pos and cat.dist are handled differently) |
| cat.prompts | Boolean indicating whether to display help text on category name positioning or not) |
| rotation.degree | Number of degrees to rotate the entire diagram |
| rotation.centre | A vector (length 2) indicating (x,y) of the rotation centre |
| ind | Boolean indicating whether the function is to automatically draw the diagram before returning the gList object or not |

| | |
|-------------|---|
| sep.dist | Number between 0 and 1 giving the distance between circles in certain Euler diagrams with mutually exclusive sets |
| offset | Number giving the amount of offset from the centre in certain Euler diagrams with inclusive sets |
| cex.prop | A function or string used to rescale areas |
| print.mode | Can be either 'raw' or 'percent'. This is the format that the numbers will be printed in. Can pass in a vector with the second element being printed under the first |
| sigdigs | If one of the elements in print.mode is 'percent', then this is how many significant digits will be kept |
| direct.area | If this is equal to true, then the vector passed into area.vector will be directly assigned to the areas of the corresponding regions. Only use this if you know which positions in the vector correspond to which regions in the diagram |
| area.vector | An argument to be used when direct.area is true. These are the areas of the corresponding regions in the Venn Diagram |
| ... | Additional arguments to be passed, including margin, which indicates amount of whitespace around the final diagram in npc units |

Details

Euler diagrams are drawn for 19 special cases if `euler.d == TRUE`. Certain Euler diagrams make use of the `scaled`, `sep.dist`, or `offset` arguments specific to two-set Venn diagrams where appropriate. The function defaults to placing the three circles in a triangular arrangement with two sets on top and one set below. The circles correspond to `area1`, `area2` and `area3` in a clockwise fashion with `area1` on the top left. N.B. General scaling for three-set Venn diagrams are disabled due to potentially misleading visual representation of the data. To re-enable, assign any value to variable `overrideTriple`.

Value

Returns an object of class `gList` containing the grid objects that make up the diagram. Also displays the diagram in a graphical device unless specified with `ind = FALSE`. `Grid::grid.draw` can be used to draw the `gList` object in a graphical device.

Author(s)

Hanbo Chen

Examples

```
# A simple three-set diagram
venn.plot <- draw.triple.venn(65, 75, 85,
  35, 15, 25, 5, c("First", "Second", "Third"));
grid.draw(venn.plot);
grid.newpage();

# A more complicated diagram
venn.plot <- draw.triple.venn(
```

```
area1 = 65,
area2 = 75,
area3 = 85,
n12 = 35,
n23 = 15,
n13 = 25,
n123 = 5,
category = c("First", "Second", "Third"),
fill = c("blue", "red", "green"),
lty = "blank",
cex = 2,
cat.cex = 2,
cat.col = c("blue", "red", "green")
);
grid.draw(venn.plot);
grid.newpage();

# Demonstrating an Euler diagram
venn.plot <- draw.triple.venn(20, 40, 60, 0, 0, 0, 0,
  c("First", "Second", "Third"), sep.dist = 0.1, rotation.degree = 30);

# Writing to file
tiff(
  filename = tempfile(
    pattern = 'Triple_Venn_diagram',
    fileext = '.tiff'
  ),
  compression = "lzw"
);

grid.draw(venn.plot);
dev.off();
```

get.venn.partitions *Get the size of individual partitions in a Venn diagram*

Description

Partitions a list into Venn regions.

Usage

```
get.venn.partitions(x, force.unique = TRUE, keep.elements = TRUE,
  hierarchical = FALSE)
```

Arguments

x A list of vectors.

force.unique A logical value. Should only unique values be considered?

`keep.elements` A logical value. Should the elements in each region be returned?
`hierarchical` A logical value. Changed the way overlapping elements are treated if `force.unique` is TRUE.

Value

A data frame with `length(x)` columns and $2^{\text{length}(x)}$ rows. The first `length(x)` columns are all logical; see [make.truth.table](#) for more details. There are three additional columns:

..set.. A set theoretical description of the Venn region. (Note that in some locales under Windows, the data.frame print method fails to correctly display the Unicode symbols for set union and set intersection. This is a bug in R, not this function.)

..values.. A vector of values contained in the Venn region. Not returned if `keep.elements` is FALSE.

..count.. An integer of the number of values in the Venn region.

Details

If `force.unique` is FALSE, then there are two supported methods of grouping categories with duplicated elements in common. If `hierarchical` is FALSE, then any common elements are gathered into a pool. So if `x <- list(a = c(1, 1, 2, 2, 3, 3), b = c(1, 2, 3, 4, 4, 5), c = c(1, 4))` then `(b intersect c)/(a)` would contain three 4's. Since the 4's are pooled, `(b)/(a union c)` contains no 4's. If `hierarchical` is TRUE, then `(b intersect c)/(a)` would contain one 4. Then `(b)/(a union c)` contains one 4.

Author(s)

Richard Cotton.

See Also

[venn.diagram](#), [make.truth.table](#)

Examples

```
# Compare force.unique options
x <- list(a = c(1, 1, 1, 2, 2, 3), b = c(2, 2, 2, 3, 4, 4))
get.venn.partitions(x)
get.venn.partitions(x, force.unique = FALSE)

# Figure 1D from ?venn.diagram
xFig1d = list(
  I = c(1:60, 61:105, 106:140, 141:160, 166:175, 176:180, 181:205,
        206:220),
  IV = c(531:605, 476:530, 336:375, 376:405, 181:205, 206:220, 166:175,
         176:180),
  II = c(61:105, 106:140, 181:205, 206:220, 221:285, 286:335, 336:375,
         376:405),
  III = c(406:475, 286:335, 106:140, 141:160, 166:175, 181:205, 336:375,
          476:530)
)
```

```
get.venn.partitions(xFig1d)
grid.draw(VennDiagram::venn.diagram(x, NULL, disable.logging = TRUE))
```

make.truth.table *Make a truth table*

Description

Makes a truth table of the inputs.

Usage

```
make.truth.table(x)
```

Arguments

x A short vector.

Value

A data frame with length(x) logical vector columns and $2^{\text{length}(x)}$ rows.

Author(s)

Richard Cotton

See Also

[expand.grid](#)

Examples

```
## Not run: make.truth.table(c(a = 1, b = 2, c = 3, d = 4))
```

venn.diagram *Make a Venn Diagram*

Description

This function takes a list and creates a publication-quality TIFF Venn Diagram

Usage

```
venn.diagram(x, filename, disable.logging = FALSE, height = 3000,
  width = 3000, resolution = 500, imagetype = "tiff",
  units = "px", compression = "lzw", na = "stop", main = NULL,
  sub = NULL, main.pos = c(0.5, 1.05), main.fontface = "plain",
  main.fontfamily = "serif", main.col = "black",
  main.cex = 1, main.just = c(0.5, 1), sub.pos = c(0.5,
  1.05), sub.fontface = "plain", sub.fontfamily =
  "serif", sub.col = "black", sub.cex = 1, sub.just =
  c(0.5, 1), category.names = names(x), force.unique =
  TRUE, print.mode = "raw", sigdigs = 3, direct.area =
  FALSE, area.vector = 0, hyper.test = FALSE, total.population = NULL,
  lower.tail = TRUE, ...)
```

Arguments

| | |
|------------------------------|---|
| <code>x</code> | A list of vectors (e.g., integers, chars), with each component corresponding to a separate circle in the Venn diagram |
| <code>filename</code> | Filename for image output, or if NULL returns the grid object itself |
| <code>disable.logging</code> | Boolean to disable log file output and print to console instead |
| <code>height</code> | Integer giving the height of the output figure in units |
| <code>width</code> | Integer giving the width of the output figure in units |
| <code>resolution</code> | Resolution of the final figure in DPI |
| <code>imagetype</code> | Specification of the image format (e.g. tiff, png or svg) |
| <code>units</code> | Size-units to use for the final figure |
| <code>compression</code> | What compression algorithm should be applied to the final tiff |
| <code>na</code> | Missing value handling method: "none", "stop", "remove" |
| <code>main</code> | Character giving the main title of the diagram |
| <code>sub</code> | Character giving the subtitle of the diagram |
| <code>main.pos</code> | Vector of length 2 indicating (x,y) of the main title |
| <code>main.fontface</code> | Character giving the fontface (font style) of the main title |
| <code>main.fontfamily</code> | Character giving the fontfamily (font type) of the main title |
| <code>main.col</code> | Character giving the colour of the main title |
| <code>main.cex</code> | Number giving the cex (font size) of the main title |
| <code>main.just</code> | Vector of length 2 indicating horizontal and vertical justification of the main title |
| <code>sub.pos</code> | Vector of length 2 indicating (x,y) of the subtitle |
| <code>sub.fontface</code> | Character giving the fontface (font style) of the subtitle |
| <code>sub.fontfamily</code> | Character giving the fontfamily (font type) of the subtitle |
| <code>sub.col</code> | Character Colour of the subtitle |

| | |
|------------------|---|
| sub.cex | Number giving the cex (font size) of the subtitle |
| sub.just | Vector of length 2 indicating horizontal and vertical justification of the subtitle |
| category.names | Allow specification of category names using plotmath syntax |
| force.unique | Logical specifying whether to use only unique elements in each item of the input list or use all elements. Defaults to FALSE |
| print.mode | Can be either 'raw' or 'percent'. This is the format that the numbers will be printed in. Can pass in a vector with the second element being printed under the first |
| sigdigs | If one of the elements in print.mode is 'percent', then this is how many significant digits will be kept |
| direct.area | If this is equal to true, then the vector passed into area.vector will be directly assigned to the areas of the corresponding regions. Only use this if you know which positions in the vector correspond to which regions in the diagram |
| area.vector | An argument to be used when direct.area is true. These are the areas of the corresponding regions in the Venn Diagram |
| hyper.test | If there are only two categories in the venn diagram and total.population is not NULL, then perform the hypergeometric test and add it to the sub title. |
| total.population | An argument to be used when hyper.test is true. This is the total population size |
| lower.tail | logical; if TRUE (default), probabilities are $P[X \leq x]$, otherwise, $P[X > x]$ |
| ... | A series of graphical parameters tweaking the plot. See below for details |

Details

| Argument | Venn Sizes | Class | Description |
|--------------|------------|-----------|---|
| lwd | 1,2,3,4,5 | numeric | Vector giving the width of each circle's circumference |
| lty | 1,2,3,4,5 | numeric | Vector giving the dash pattern of each circle's circumference |
| col | 1,2,3,4,5 | character | Vector giving the colour of each circle's circumference |
| fill | 1,2,3,4,5 | character | Vector giving the colour of each circle's area |
| alpha | 1,2,3,4,5 | numeric | Vector giving the alpha transparency of each circle's area |
| label.col | 1,2,3,4,5 | character | Vector giving the colour for each area label (length = 1/3/7/15 based on set-number) |
| cex | 1,2,3,4,5 | numeric | Vector giving the size for each area label (length = 1/3/7/15 based on set-number) |
| fontface | 1,2,3,4,5 | character | Vector giving the fontface for each area label (length = 1/3/7/15 based on set-number) |
| fontfamily | 1,2,3,4,5 | character | Vector giving the fontfamily for each area label (length = 1/3/7/15 based on set-number) |
| cat.pos | 1,2,3,4,5 | numeric | Vector giving the position (in degrees) of each category name along the circle, with 0 at 12 o'clock |
| cat.dist | 1,2,3,4,5 | numeric | Vector giving the distance (in npc units) of each category name from the edge of the circle (can be negative) |
| cat.cex | 1,2,3,4,5 | numeric | Vector giving the size for each category name |
| cat.col | 1,2,3,4,5 | character | Vector giving the colour for each category name |
| cat.fontface | 1,2,3,4,5 | character | Vector giving the fontface for each category name |

| | | | |
|-----------------|-----------|------------------|--|
| cat.fontfamily | 1,2,3,4,5 | <i>character</i> | Vector giving the fontfamily for each category name |
| cat.just | 1,2,3,4,5 | <i>numeric</i> | List (length = 1/2/3/4 based on set number) of Vectors of length 2 indicating horizontal and vertical justification for each category name |
| cat.default.pos | 1,2,3 | <i>character</i> | One of c('outer', 'text') to specify the default location of category names (cat.pos and cat.dist are handled differently) |
| cat.prompts | 2 | <i>numeric</i> | Boolean indicating whether to display help text on category name positioning or not |
| margin | 1,2,3,4,5 | <i>numeric</i> | Number giving the amount of whitespace around the diagram in grid units |
| rotation.degree | 1,2,3,4,5 | <i>numeric</i> | Number of degrees to rotate the entire diagram |
| rotation.centre | 1,2,3,4,5 | <i>numeric</i> | Vector of length 2 indicating (x,y) of the rotation centre |
| rotation | 3 | <i>numeric</i> | Number giving the clockwise rotation of a three-set Venn diagram (1, 2, or 3) |
| reverse | 3 | <i>logical</i> | Reflect the three-set Venn diagram along its central vertical axis of symmetry. Use in combination with rotation to generate all possible set orders |
| euler.d | 2, 3 | <i>logical</i> | Enable Euler diagrams for two-set and three-set Venn diagrams (Venn Diagrams with moveable circles) |
| scaled | 2, 3 | <i>logical</i> | Enable scaling for two-set and certain three-set Euler diagrams. (euler.d must be true to enable this) |
| sep.dist | 2, 3 | <i>numeric</i> | Controls the separation between distinct circles in certain two-set or three-set Euler diagrams. |
| offset | 2, 3 | <i>numeric</i> | Number between 0 and 1 giving the amount to offset the smaller circle by in the inclusion type of two-set Euler diagram and certain similar three-set Euler diagrams. |
| inverted | 2 | <i>logical</i> | Flip the two-set Venn diagram along its vertical axis (distinguished from reverse) |
| ext.text | 2 | <i>logical</i> | Allow external text labels when areas are small |
| ext.percent | 2 | <i>numeric</i> | A vector (length 3) indicating the proportion that a partial area has to be smaller than to trigger external text placement. The elements allow for individual control of the areas in the order of the first area, second area and intersection area. |
| ext.pos | 2 | <i>numeric</i> | A vector (length 1 or 2) giving the positions (in degrees) of the external area labels along the circles, with 0 (default) at 12 o'clock |
| ext.line.lwd | 2 | <i>numeric</i> | Width of line connecting to ext.text |
| ext.line.lty | 2 | <i>numeric</i> | The dash pattern of the lines connecting the external area labels to their anchor points. |
| ext.dist | 2 | <i>numeric</i> | Vector of length 1 or 2 indicating length of external line (use negative values to shorten the line) |
| ext.length | 2 | <i>numeric</i> | Vector of length 1 or 2 indicating the proportion of the external line that is drawn from the anchor to the text |

Value

Plots a figure to the file given by the *filename* argument.

Author(s)

Hanbo Chen

See Also

[draw.single.venn](#), [draw.pairwise.venn](#), [draw.triple.venn](#), [draw.quad.venn](#), [draw.quintuple.venn](#)

Examples

```
# Note: most examples are listed as dontrun to meet CRAN requirements,  
# but all should work as-is!
```

```
# compact and minimal notation  
## Not run:  
venn.plot <- venn.diagram(  
  list(A = 1:150, B = 121:170),  
  filename = tempfile(  
    pattern = 'Venn_2set_simple',  
    fileext = '.tiff'  
  )  
);  
venn.plot <- venn.diagram(  
  list(A = 1:150, B = 121:170, C = 101:200),  
  filename = tempfile(  
    pattern = 'Venn_3set_simple',  
    fileext = '.tiff'  
  )  
);
```

```
## End(Not run)
```

```
# a more elaborate two-set Venn diagram with title and subtitle  
venn.plot <- venn.diagram(  
  x = list(  
    "A" = 1:100,  
    "B" = 96:140  
  ),  
  filename = tempfile(  
    pattern = 'Venn_2set_complex',  
    fileext = '.tiff'  
  ),  
  scaled = TRUE,  
  ext.text = TRUE,  
  ext.line.lwd = 2,  
  ext.dist = -0.15,  
  ext.length = 0.9,  
  ext.pos = -4,  
  inverted = TRUE,
```

```

cex = 2.5,
cat.cex = 2.5,
rotation.degree = 45,
main = "Complex Venn Diagram",
sub = "Featuring: rotation and external lines",
main.cex = 2,
sub.cex = 1
);

## Not run:
# sample three-set Euler diagram
venn.plot <- venn.diagram(
x = list(
"Num A" = paste("Num", 1:100),
"Num B" = c(paste("Num", 61:70), paste("Num", 71:100)),
"Num C" = c(paste("Num", 41:60), paste("Num", 61:70))),
euler.d = TRUE,
filename = tempfile(
  pattern = 'Euler_3set_simple',
  fileext = '.tiff'
),
cat.pos = c(-20, 0, 20),
cat.dist = c(0.05, 0.05, 0.02),
cex = 2.5,
cat.cex = 2.5,
reverse = TRUE
);

# sample three-set Euler diagram
venn.plot <- venn.diagram(
x = list(
A = c(1:10),
B = c(11:90),
C = c(81:90)
),
euler.d = TRUE,
filename = tempfile(
  pattern = 'Euler_3set_scaled',
  fileext = '.tiff'
),
cex = 2.5,
cat.cex = 2.5,
cat.pos = 0
);

## End(Not run)

# sample four-set Venn Diagram
A <- sample(1:1000, 400, replace = FALSE);
B <- sample(1:1000, 600, replace = FALSE);
C <- sample(1:1000, 350, replace = FALSE);
D <- sample(1:1000, 550, replace = FALSE);
E <- sample(1:1000, 375, replace = FALSE);

```

```

venn.plot <- venn.diagram(
  x = list(
    A = A,
    D = D,
    B = B,
    C = C
  ),
  filename = tempfile(
    pattern = 'Venn_4set_pretty',
    fileext = '.tiff'
  ),
  col = "transparent",
  fill = c("cornflowerblue", "green", "yellow", "darkorchid1"),
  alpha = 0.50,
  label.col = c("orange", "white", "darkorchid4", "white",
    "white", "white", "white", "white", "darkblue", "white",
    "white", "white", "white", "darkgreen", "white"),
  cex = 1.5,
  fontfamily = "serif",
  fontface = "bold",
  cat.col = c("darkblue", "darkgreen", "orange", "darkorchid4"),
  cat.cex = 1.5,
  cat.pos = 0,
  cat.dist = 0.07,
  cat.fontfamily = "serif",
  rotation.degree = 270,
  margin = 0.2
);

# sample five-set Venn Diagram
venn.plot <- venn.diagram(
  x = list(
    A = A,
    B = B,
    C = C,
    D = D,
    E = E
  ),
  filename = tempfile(
    pattern = 'Venn_5set_pretty',
    fileext = '.tiff'
  ),
  col = "black",
  fill = c("dodgerblue", "goldenrod1", "darkorange1", "seagreen3", "orchid3"),
  alpha = 0.50,
  cex = c(1.5, 1.5, 1.5, 1.5, 1.5, 1, 0.8, 1, 0.8, 1, 0.8, 1, 0.8,
    1, 0.8, 1, 0.55, 1, 0.55, 1, 0.55, 1, 0.55, 1, 0.55, 1, 1, 1, 1, 1, 1.5),
  cat.col = c("dodgerblue", "goldenrod1", "darkorange1", "seagreen3", "orchid3"),
  cat.cex = 1.5,
  cat.fontface = "bold",
  margin = 0.05
);

```

```

# Complex three-way Venn with labels & sub-/super-scripts
venn.plot <- venn.diagram(
  x = list(
    I = c(1:60, 61:105, 106:140, 141:160, 166:175, 176:180, 181:205,
          206:220),
    II = c(531:605, 476:530, 336:375, 376:405, 181:205, 206:220, 166:175,
           176:180),
    III = c(61:105, 106:140, 181:205, 206:220, 221:285, 286:335, 336:375,
            376:405)
  ),
  category.names = c(
    expression( bold('A'['1: subscript']) ),
    expression( bold('B'^'2: going up') ),
    expression( paste(bold('C'^'3'), bold('X'['i' <= 'r'^'2']^'2') ) )
  ),
  filename = tempfile(
    pattern = 'Fig3-1_triple_labels_sub_and_superscripts',
    fileext = '.tiff'
  ),
  output = TRUE,
  height = 3000,
  width = 3000,
  resolution = 300,
  compression = 'lzw',
  units = 'px',
  lwd = 6,
  lty = 'blank',
  fill = c('yellow', 'purple', 'green'),
  cex = 3.5,
  fontface = "bold",
  fontfamily = "sans",
  cat.cex = 3,
  cat.fontface = "bold",
  cat.default.pos = "outer",
  cat.pos = c(-27, 27, 135),
  cat.dist = c(0.055, 0.055, 0.085),
  cat.fontfamily = "sans",
  rotation = 1
);

# Complex 3-way Venn using expressions
venn.plot <- venn.diagram(
  x = list(
    "Num A" = paste("Num", 1:100),
    "Num B" = c(paste("Num", 61:70), paste("Num", 71:100)),
    "Num C" = c(paste("Num", 41:60), paste("Num", 61:70)),
    category.names = c(
      expression( bold('A'['1']) ),
      expression( bold('A'['2']) ),
      expression( bold('A'['3']) )
    )
  ),
  euler.d = TRUE,

```

```
filename = tempfile(
  pattern = 'Fig3-2_Euler_3set_simple_with_subscripts',
  fileext = '.tiff'
),
cat.pos = c(-20, 0, 20),
cat.dist = c(0.05, 0.05, 0.02),
cex = 2.5,
cat.cex = 2.5,
reverse = TRUE
);

## Not run:
# Example to print to screen
venn.plot <- venn.diagram(
  x = list(
    sample1 = c(1:40),
    sample2 = c(30:60)
  ),
  filename = NULL,
  disable.logging = TRUE
);

# Save picture to non-TIFF file type
# currently working on adding this functionality directly into venn.diagram
venn.plot <- venn.diagram(
  x = list (
    A = 1:10,
    B = 6:25
  ),
  filename = NULL,
  disable.logging = TRUE
);

jpeg(tempfile(pattern = 'venn_jpeg', fileext = '.jpg'));
grid.draw(venn.plot);
dev.off();

## End(Not run)

#dontrun-starts-here
### NB: All figures from the paper can be run, but are turned off from
### automatic execution to reduce burden on CRAN computing resources.
## Not run:
# Figure 1A
venn.plot <- venn.diagram(
  x = list(
    Label = 1:100
  ),
  filename = tempfile(
    pattern = '1A-single_Venn',
    fileext = '.tiff'
  ),
```

```
col = "black",
lwd = 9,
fontface = "bold",
fill = "grey",
alpha = 0.75,
cex = 4,
cat.cex = 3,
cat.fontface = "bold",
);

# Figure 1B
venn.plot <- venn.diagram(
x = list(
X = 1:150,
Y = 121:180
),
filename = tempfile(
pattern = '1B-double_Venn',
fileext = '.tiff'
),
lwd = 4,
fill = c("cornflowerblue", "darkorchid1"),
alpha = 0.75,
label.col = "white",
cex = 4,
fontfamily = "serif",
fontface = "bold",
cat.col = c("cornflowerblue", "darkorchid1"),
cat.cex = 3,
cat.fontfamily = "serif",
cat.fontface = "bold",
cat.dist = c(0.03, 0.03),
cat.pos = c(-20, 14)
);

# Figure 1C
venn.plot <- venn.diagram(
x = list(
R = c(1:70, 71:110, 111:120, 121:140),
B = c(141:200, 71:110, 111:120, 201:230),
G = c(231:280, 111:120, 121:140, 201:230)
),
filename = tempfile(
pattern = '1C-triple_Venn',
fileext = '.tiff'
),
col = "transparent",
fill = c("red", "blue", "green"),
alpha = 0.5,
label.col = c("darkred", "white", "darkblue", "white",
"white", "white", "darkgreen"),
cex = 2.5,
fontfamily = "serif",
```

```

fontface = "bold",
cat.default.pos = "text",
cat.col = c("darkred", "darkblue", "darkgreen"),
cat.cex = 2.5,
cat.fontfamily = "serif",
cat.dist = c(0.06, 0.06, 0.03),
cat.pos = 0
);

# Figure 1D
venn.plot <- venn.diagram(
x = list(
I = c(1:60, 61:105, 106:140, 141:160, 166:175, 176:180, 181:205,
206:220),
IV = c(531:605, 476:530, 336:375, 376:405, 181:205, 206:220, 166:175,
176:180),
II = c(61:105, 106:140, 181:205, 206:220, 221:285, 286:335, 336:375,
376:405),
III = c(406:475, 286:335, 106:140, 141:160, 166:175, 181:205, 336:375,
476:530)
),
filename = tempfile(
pattern = '1D-quadruple_Venn',
fileext = '.tiff'
),
col = "black",
lty = "dotted",
lwd = 4,
fill = c("cornflowerblue", "green", "yellow", "darkorchid1"),
alpha = 0.50,
label.col = c("orange", "white", "darkorchid4", "white", "white", "white",
"white", "white", "darkblue", "white",
"white", "white", "white", "darkgreen", "white"),
cex = 2.5,
fontfamily = "serif",
fontface = "bold",
cat.col = c("darkblue", "darkgreen", "orange", "darkorchid4"),
cat.cex = 2.5,
cat.fontfamily = "serif"
);

# Figure 2-1
venn.plot <- venn.diagram(
x = list(
A = 1:105,
B = 101:115
),
filename = tempfile(
pattern = '2-1_special_case_ext-text',
fileext = '.tiff'
),
cex = 2.5,
cat.cex = 2.5,

```

```
cat.pos = c(-20, 20),
ext.line.lty = "dotted",
ext.line.lwd = 2,
ext.pos = 12,
ext.dist = -0.12,
ext.length = 0.85
);

# Figure 2-2
venn.plot <- venn.diagram(
x = list(
A = 1:100,
B = 1:10
),
filename = tempfile(
pattern = '2-2_special_case_pairwise-inclusion',
fileext = '.tiff'
),
cex = 2.5,
cat.cex = 2.5,
cat.pos = 0
);

# Figure 2-3
venn.plot <- venn.diagram(
x = list(
A = 1:150,
B = 151:250
),
filename = tempfile(
pattern = '2-3_special_case_pairwise-exclusion',
fileext = '.tiff'
),
cex = 2.5,
cat.cex = 2.5,
cat.pos = c(0, 0),
cat.dist = 0.05
);

# Figure 2-4
venn.plot <- venn.diagram(
x = list(
A = c(1:50, 101:140, 141:160, 161:170),
B = c(171:230, 101:140, 161:170, 291:320),
C = c(141:160, 161:170, 291:320)
),
filename = tempfile(
pattern = '2-4_triple_special_case-001',
fileext = '.tiff'
),
cex = 2.5,
cat.cex = 2.5,
cat.dist = c(0.05, 0.05, -0.1)
```



```
);

# Figure 2-5
venn.plot <- venn.diagram(
  x = list(
    A = c(1:100),
    B = c(61:70, 71:100),
    C = c(41:60, 61:70)
  ),
  filename = tempfile(
    pattern = '2-5_triple_special_case-012AA',
    fileext = '.tiff'
  ),
  cex = 2.5,
  cat.cex = 2.5,
  cat.pos = c(-25, 0, 30),
  cat.dist = c(0.05, 0.05, 0.02)
);

# Figure 2-6
venn.plot <- venn.diagram(
  x = list(
    A = c(1:90),
    B = c(1:25),
    C = c(1:5)
  ),
  filename = tempfile(
    pattern = '2-6_triple_special_case-022AAA0',
    fileext = '.tiff'
  ),
  cex = 2.5,
  cat.cex = 2.5,
  cat.pos = 0,
  cat.dist = c(0.03, 0.03, 0.01)
);

# Figure 2-7
venn.plot <- venn.diagram(
  x = list(
    A = c(1:20),
    B = c(21:80),
    C = c(81:210)
  ),
  filename = tempfile(
    pattern = '2-7_triple_special_case-100',
    fileext = '.tiff'
  ),
  cex = 2.5,
  cat.cex = 2.5,
  cat.dist = 0.05
);

# Figure 2-8
```

```
venn.plot <- venn.diagram(  
  x = list(  
    A = c(1:80),  
    B = c(41:150),  
    C = c(71:100)  
  ),  
  filename = tempfile(  
    pattern = '2-8_triple_special_case-011A',  
    fileext = '.tiff'  
  ),  
  cex = 2.5,  
  cat.cex = 2.5,  
  cat.dist = c(0.07, 0.07, 0.02),  
  cat.pos = c(-20, 20, 20)  
);  
  
# Figure 2-9  
venn.plot <- venn.diagram(  
  x = list(  
    A = c(1:10),  
    B = c(11:90),  
    C = c(81:90)  
  ),  
  filename = tempfile(  
    pattern = '2-9_triple_special_case-121A0',  
    fileext = '.tiff'  
  ),  
  cex = 2.5,  
  cat.cex = 2.5,  
  cat.pos = 0,  
  cat.dist = c(0.04, 0.04, 0.02),  
  reverse = TRUE  
);  
  
#dontrun-ends-here  
  
## End(Not run)
```

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