Package ‘VennDiagram’

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Depends R (>= 2.14.1), 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.
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VennDiagram-package  Venn diagram plotting

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

Details

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<td>License</td>
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Author(s)
Author: Hanbo Chen <Hanbert.Chen@mail.utoronto.ca>
Maintainer: Dr. Paul C. Boutros <Paul.Boutros@utoronto.ca>

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**

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

**Description**

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

**Usage**

```r
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.centred = c(0.5, 0.5),
ind = TRUE, sep.dist = 0.05, offset = 0, cex.prop =
NULL, print.mode = "raw", sigdigs = 3,...)
```
### Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>area1</td>
<td>The size of the first set</td>
</tr>
<tr>
<td>area2</td>
<td>The size of the second set</td>
</tr>
<tr>
<td>cross.area</td>
<td>The size of the intersection between the sets</td>
</tr>
<tr>
<td>category</td>
<td>A vector (length 2) of strings giving the category names of the sets</td>
</tr>
<tr>
<td>euler.d</td>
<td>Boolean indicating whether to draw Euler diagrams when conditions are met or not (Venn Diagrams with moveable circles)</td>
</tr>
<tr>
<td>scaled</td>
<td>Boolean indicating whether to scale circle sizes in the diagram according to set sizes or not (euler.d must be true to enable this)</td>
</tr>
<tr>
<td>inverted</td>
<td>Boolean indicating whether the diagram should be mirrored long the vertical axis or not</td>
</tr>
<tr>
<td>ext.text</td>
<td>Boolean indicating whether to place area labels outside the circles in case of small partial areas or not</td>
</tr>
<tr>
<td>ext.percent</td>
<td>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 area1, area2 and intersect area.</td>
</tr>
<tr>
<td>lwd</td>
<td>A vector (length 2) of numbers giving the line width of the circles’ circumferences</td>
</tr>
<tr>
<td>lty</td>
<td>A vector (length 2) giving the line dash pattern of the circles’ circumferences</td>
</tr>
<tr>
<td>col</td>
<td>A vector (length 2) giving the colours of the circles’ circumferences</td>
</tr>
<tr>
<td>fill</td>
<td>A vector (length 2) giving the colours of the circles’ areas</td>
</tr>
<tr>
<td>alpha</td>
<td>A vector (length 2) giving the alpha transparency of the circles’ areas</td>
</tr>
<tr>
<td>label.col</td>
<td>A vector (length 3) giving the colours of the areas’ labels</td>
</tr>
<tr>
<td>cex</td>
<td>A vector (length 3) giving the size of the areas’ labels</td>
</tr>
<tr>
<td>fontface</td>
<td>A vector (length 3) giving the fontface of the areas’ labels</td>
</tr>
<tr>
<td>fontfamily</td>
<td>A vector (length 3) giving the fontfamily of the areas’ labels</td>
</tr>
<tr>
<td>cat.pos</td>
<td>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</td>
</tr>
<tr>
<td>cat.dist</td>
<td>A vector (length 2) giving the distances (in npc units) of the category names from the edges of the circles (can be negative)</td>
</tr>
<tr>
<td>cat.cex</td>
<td>A vector (length 2) giving the size of the category names</td>
</tr>
<tr>
<td>cat.col</td>
<td>A vector (length 2) giving the colours of the category names</td>
</tr>
<tr>
<td>cat.fontface</td>
<td>A vector (length 2) giving the fontface of the category names</td>
</tr>
<tr>
<td>cat.fontfamily</td>
<td>A vector (length 2) giving the fontfamily of the category names</td>
</tr>
<tr>
<td>cat.just</td>
<td>List of 2 vectors of length 2 indicating horizontal and vertical justification of each category name</td>
</tr>
<tr>
<td>cat.default.pos</td>
<td>One of c(‘outer’, ‘text’) to specify the default location of category names (cat.pos and cat.dist are handled differently)</td>
</tr>
</tbody>
</table>
**draw.pairwise.venn**

**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 (\(\text{cross.area} = 0\)), inclusive sets (\(\text{area1} = 0\) or \(\text{area2} = 0\)), and coincidental sets (\(\text{area1} = 0\) and \(\text{area2} = 0\)) 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
vnn.plot <- draw.pairwise.venn(100, 70, 30, c("First", "Second"));
grid.draw(vnn.plot);
grid.newpage();

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

# A more complicated diagram demonstrating external area labels
vnn.plot <- draw.pairwise.venn(
  areaQ = QPPL
  areaR = WPL
  crossNarea = VXL
  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(vnn.plot);
grid.newpage();

# Demonstrating an Euler diagram
vnn.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 = "Pairwise_Venn_diagram.tiff", compression = "lzw");
grid.draw(vnn.plot);
**draw.quad.venn**

```
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(-0.15, 0.15, 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  
- `n124`: The size of the intersection between the first, second and fourth sets  
- `n134`: The size of the intersection between the first, third and fourth sets  
- `n234`: The size of the intersection between the second, third and fourth sets  
- `n1234`: The size of the intersection between all four sets
draw.quad.venn

category  A vector (length 4) of strings giving the category names of the sets
lwd       A vector (length 4) of numbers giving the line width of the circles’ circumferences
lty       A vector (length 4) giving the dash pattern of the circles’ circumferences
col       A vector (length 4) giving the colours of the circles’ circumferences
fill      A vector (length 4) giving the colours of the circles’ areas
alpha     A vector (length 4) giving the alpha transparency of the circles’ areas
label.col A vector (length 15) giving the colours of the areas’ labels
cex       A vector (length 15) giving the size of the areas’ labels
fontface  A vector (length 15) giving the fontface of the areas’ labels
fontfamily A vector (length 15) giving the fontfamily of the areas’ labels
cat.pos   A vector (length 4) giving the positions (in degrees) of the category names along the circles, with 0 (default) at 12 o’clock
cat.dist  A vector (length 4) giving the distances (in npc units) of the category names from the edges of the circles (can be negative)
cat.cex   A vector (length 4) giving the size of the category names
cat.col   A vector (length 4) giving the colours of the category names
cat.fontface A vector (length 4) giving the fontface of the category names
cat.fontfamily A vector (length 4) giving the fontfamily of the category names
cat.just  List of 4 vectors of length 2 indicating horizontal and vertical justification of each category name
rotation.degree Number of degrees to rotate the entire diagram
rotationcentre 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
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
sigdigits 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

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 = 58,
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 = "Quad_Venn_diagram.tiff", compression = "lzw");
grid.draw(venn.plot);
dev.off();
Description

Creates a Venn diagram with five sets.

Usage

```r
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 |
| 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 |
| cat.just | List of 5 vectors of length 2 indicating horizontal and vertical justification of each category name |
| rotation.degree | Number of degrees to rotate the entire diagram |
rotation.center
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

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
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,
Draw a Venn Diagram with a Single Set

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");

# Writing to file
tiff(filename = "Quintuple_Venn_diagram.tiff", compression = "lzw");
grid.draw(venn.plot); dev.off();
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**

```r
# 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 = "Single_Venn_diagram.tiff", compression = "lzw");
venn.plot <- draw.single.venn(100, "First", ind = FALSE);
grid.draw(venn.plot);
dev.off();
```
**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, rotationCentre = 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)
draw.triple.venn

- **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
draw.triple.venn(65, 75, 85,
  35, 15, 25, 5, c("First", "Second", "Third"));
grid.draw(venn.plot);
grid.newpage();

# A more complicated diagram
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",
  ...)
get.venn.partitions

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 \( \text{length}(x) \) columns and \( 2^\text{length}(x) \) rows. The first \( \text{length}(x) \) 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.
**Description**

Makes a truth table of the inputs.

**Usage**

```r
make.truth.table(x)
```
venn.diagram

Arguments

x  
A short vector.

Value

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

Author(s)

Richard Cotton

See Also

divide, expand.grid

Examples

```r
## 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

```r
venn.diagram(x, filename, height = 3000, width = 3000, resolution = 500, imagetype = "tif", 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.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, ...)
```

Arguments

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

filename  
Filename for image output, or if NULL returns the grid object itself

height  
Integer giving the height of the output figure in units

width  
Integer giving the width of the output figure in units
resolution Resolution of the final figure in DPI
imagetype Specification of the image format (e.g. tiff, png or svg)
units Size-units to use for the final figure
compression What compression algorithm should be applied to the final tiff
na Missing value handling method: "none", "stop", "remove"
main Character giving the main title of the diagram
sub Character giving the subtitle of the diagram
main.pos Vector of length 2 indicating (x,y) of the main title
main.fontface Character giving the fontface (font style) of the main title
main.fontfamily Character giving the fontfamily (font type) of the main title
main.col Character giving the colour of the main title
main.cex Number giving the cex (font size) of the main title
main.just Vector of length 2 indicating horizontal and vertical justification of the main title
sub.pos Vector of length 2 indicating (x,y) of the subtitle
sub.fontface Character giving the fontface (font style) of the subtitle
sub.fontfamily Character giving the fontfamily (font type) of the subtitle
sub.col 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 ...

Details
### venn.diagram

<table>
<thead>
<tr>
<th>Argument</th>
<th>Venn Sizes</th>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lwd</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the width of each circle’s circumference</td>
</tr>
<tr>
<td>lty</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the dash pattern of each circle’s circumference</td>
</tr>
<tr>
<td>col</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the colour of each circle’s circumference</td>
</tr>
<tr>
<td>fill</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the colour of each circle’s area</td>
</tr>
<tr>
<td>alpha</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the alpha transparency of each circle’s area</td>
</tr>
<tr>
<td>label.col</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the size for each area label (length = 1/3/7/15 based on set-number)</td>
</tr>
<tr>
<td>cex</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the size for each area label (length = 1/3/7/15 based on set-number)</td>
</tr>
<tr>
<td>fontface</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the fontface for each area label</td>
</tr>
<tr>
<td>fontfamily</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the fontfamily for each area label</td>
</tr>
<tr>
<td>cat.pos</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the position (in degrees) of each category name along the circle, with 0 at 12 o'clock</td>
</tr>
<tr>
<td>cat.dist</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the distance (in npc units) of each category name from the edge</td>
</tr>
<tr>
<td>cat.cex</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector giving the size for each category name</td>
</tr>
<tr>
<td>cat.col</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the colour for each category name</td>
</tr>
<tr>
<td>cat.fontface</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the fontface for each category name</td>
</tr>
<tr>
<td>cat.fontfamily</td>
<td>1,2,3,4,5</td>
<td>character</td>
<td>Vector giving the fontfamily for each category name</td>
</tr>
<tr>
<td>cat.just</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>List (length = 1/2/3/4 based on set number) of Vectors of length 2 indicating horizontal and vertical justification for each category name</td>
</tr>
<tr>
<td>cat.default.pos</td>
<td>1,2,3</td>
<td>character</td>
<td>One of c('outer', 'text') to specify the default location of category names (cat.pos and cat.dist are handled differently)</td>
</tr>
<tr>
<td>margin</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Number giving the amount of whitespace around the diagram in grid units</td>
</tr>
<tr>
<td>rotation.degree</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Number of degrees to rotate the entire diagram</td>
</tr>
<tr>
<td>rotation centres</td>
<td>1,2,3,4,5</td>
<td>numeric</td>
<td>Vector of length 2 indicating (x,y) of the rotation centre</td>
</tr>
<tr>
<td>rotation</td>
<td>3</td>
<td>numeric</td>
<td>Number giving the clockwise rotation of a three-set Venn diagram (1, 2, or 3)</td>
</tr>
<tr>
<td>reverse</td>
<td>3</td>
<td>logical</td>
<td>Reflect the three-set Venn diagram along its central vertical axis of symmetry</td>
</tr>
<tr>
<td>euler.d</td>
<td>2,3</td>
<td>logical</td>
<td>Enable Euler diagrams for two-set and three-set Venn diagrams (Venn Diagrams with moveable circles)</td>
</tr>
<tr>
<td>scaled</td>
<td>2,3</td>
<td>logical</td>
<td>Enable scaling for two-set and certain three-set Euler diagrams. (euler.d must be true)</td>
</tr>
<tr>
<td>sep.dist</td>
<td>2,3</td>
<td>numeric</td>
<td>Controls the separation between distinct circles in certain two-set or three-set Euler diagrams</td>
</tr>
<tr>
<td>offset</td>
<td>2,3</td>
<td>numeric</td>
<td>Number between 0 and 1 giving the amount to offset the smaller circle by in the offset parameter</td>
</tr>
<tr>
<td>inverted</td>
<td>2</td>
<td>logical</td>
<td>Flip the two-set Venn diagram along its vertical axis (distinguished from reverse)</td>
</tr>
<tr>
<td>ext.text</td>
<td>2</td>
<td>logical</td>
<td>Allow external text labels when areas are small</td>
</tr>
<tr>
<td>ext.percent</td>
<td>2</td>
<td>numeric</td>
<td>A vector (length 3) indicating the proportion that a partial area has to be small</td>
</tr>
<tr>
<td>ext.line.lwd</td>
<td>2</td>
<td>numeric</td>
<td>lwd of line connecting to ext.text</td>
</tr>
<tr>
<td>ext.dist</td>
<td>2</td>
<td>numeric</td>
<td>Vector of length 1 or 2 indicating length of external line (use negative values to drag the line towards the center)</td>
</tr>
<tr>
<td>ext.length</td>
<td>2</td>
<td>numeric</td>
<td>Vector of length 1 or 2 indicating the proportion of the external line that is drawn</td>
</tr>
</tbody>
</table>

### 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),
  "Venn_2set_simple.tiff"
);
venn.plot <- venn.diagram(
  list(A = 1:150, B = 121:170, C = 101:200),
  "Venn_3set_simple.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 = "Venn_2set_complex.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 = "Euler_3set_simple.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 = "Euler_3set_scaled.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 = "Venn_4set_pretty.tiff",
col = "transparent",
fill = c("cornflowerblue", "green", "yellow", "darkorchid1"),
alpha = 0.50,
label.col = c("orange", "white", "darkorchid4", "white", "white", "white", "white", "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

```r
venn.plot <- venn.diagram(
  x = list(
    A = A,
    B = B,
    C = C,
    D = D,
    E = E
  ),
  filename = "Venn_5set_pretty.tiff",
  col = "black",
  fill = c("dodgerblue", "goldenrod1", "darkorange", "seagreen3", "orchid3"),
  alpha = 0.50,
  cex = c(1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 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, 1, 1, 1, 1.5),
  cat.col = c("dodgerblue", "goldenrod1", "darkorange", "seagreen3", "orchid3"),
  cat.cex = 1.5,
  cat.fontface = "bold",
  margin = 0.05
);
```

# Complex three-way Venn with labels & sub-/super-scripts

```r
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),
      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 = 'Fig3-1_triple_labels_sub_and superscripts.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 = "Fig3-2_Euler_3set_simple_with_subscripts.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
);

# 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
);

jpeg("venn_jpeg.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:

```r
# Figure 1A
venn.plot <- venn.diagram(
x = list(
  Label = 1:100
),
filename = "1A-single_Venn.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 = "1B-double_Venn.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 = "1C-triple_Venn.tiff",
col = "transparent",
fill = c("red", "blue", "green"),
alpha = 0.5,
label.col = c("darkred", "white", "darkblue", "white",
```
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 = "2-2_special_case_pairwise-inclusion.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 = "2-3_special_case_pairwise-exclusion.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 = "2-4_triple_special_case-001.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 = "2-5_triple_special_case-012AA.tiff",
cex = 2.5,
cat.cex = 2.5,
venn.diagram

```r
cat.pos = c(-25, 0, 30),
cat.dist = c(0.05, 0.05, 0.02)
);

# Figure 2-6
venn.plot <- venn.plot(x = list(  
A = c(1:90),
B = c(1:25),
C = c(1:5)  
),
filename = "2-6_triple_special_case-022AAA0.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.plot(x = list(  
A = c(1:20),
B = c(21:80),
C = c(81:210)  
),
filename = "2-7_triple_special_case-100.tiff",
cex = 2.5,
cat.cex = 2.5,
cat.dist = 0.05
);

# Figure 2-8
venn.plot <- venn.plot(x = list(  
A = c(1:80),
B = c(41:150),
C = c(71:100)  
),
filename = "2-8_triple_special_case-011A.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.plot(x = list(  
A = c(1:10),
B = c(11:90),
C = c(81:90)  
),
filename = "2-9_triple_special_case-121A0.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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