

decksh reference



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legend

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for
efor

Assignments

polarx
polary
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format
random
sqrt
vmap

Data

data
edata

Keywords and arguments

keyword

arguments

mandatory

optional

text `"..string...." x y n`

`"font" "color" op`

text "hello, world" 80 50 2

hello, world

text "hello, world" 80 40 2 "serif"

hello, world

text "hello, world" 80 30 2 "serif" "red"

hello, world

text "hello, world" 80 20 2 "serif" "red" 50

hello, world

Structure



Percent Grid



Defining and using variables

name is thing

`x = 3.14159265` number

`s = "hello"` string

`y = x` another variable

`x = a + b` binary operation

`x *= 10` assignment operator

`text s x y 2` variable use

Binary operators

$x = a + b$

addition

$x = a - b$

subtraction

$x = a * b$

multiplication

$x = a / b$

division

Assignment operators

`x += 10`

increase x by 10

`x -= 10`

decrease x by 10

`x *= 10`

multiply x by 10

`x /= 10`

divide x by 10




Variables and Assignments

Using variables	x=10	// assign 10 to x
	y=80.45	// assign 80.45 to y
	size=x/5	// x divided by 5 to size
	s="Hello"	// s has the string value 'Hello'
	text s x y size	// Use the variables

Binary operations	a=100+200.7	// addition
	a=x-10	// subtraction
	a=x*10	// multiplication
	a=x/y	// division

















Assignment operations	x+=10	// increase x by 10
	x-=10	// decrease x by 10
	x*=10	// multiply x by 10
	x/=y	// divide x by value of y

Colors, fonts, opacity










Colors	Fonts		Opacity (0-100)	
"steelblue"	"sans"	Sans Serif	100	
"#4682b4"	"serif"	<i>Serif</i>	50	
"rgb(70,130,180)"	"mono"	Monospace	10	
	"symbol"	❁❄❅❆❇		

Color Index

name	hex	RGB
 <code>aliceblue</code>	<code>#f0f8ff</code>	<code>rgb(240,248,255)</code>
 <code>antiquewhite</code>	<code>#faebd7</code>	<code>rgb(250,235,215)</code>
 <code>aqua</code>	<code>#00ffff</code>	<code>rgb(0,255,255)</code>
 <code>aquamarine</code>	<code>#7fffd4</code>	<code>rgb(127,255,212)</code>
 <code>azure</code>	<code>#f0ffff</code>	<code>rgb(240,255,255)</code>
 <code>beige</code>	<code>#f5f5dc</code>	<code>rgb(245,245,220)</code>
 <code>bisque</code>	<code>#ffe4c4</code>	<code>rgb(255,228,196)</code>
 <code>black</code>	<code>#000000</code>	<code>rgb(0,0,0)</code>
 <code>blanchedalmond</code>	<code>#ffebcd</code>	<code>rgb(255,235,205)</code>
 <code>blue</code>	<code>#0000ff</code>	<code>rgb(0,0,255)</code>
 <code>blueviolet</code>	<code>#8a2be2</code>	<code>rgb(138,43,226)</code>
 <code>brown</code>	<code>#a52a2a</code>	<code>rgb(165,42,42)</code>
 <code>burlywood</code>	<code>#deb887</code>	<code>rgb(222,184,135)</code>
 <code>cadetblue</code>	<code>#5f9ea0</code>	<code>rgb(95,158,160)</code>
 <code>chartreuse</code>	<code>#7fff00</code>	<code>rgb(127,255,0)</code>
 <code>chocolate</code>	<code>#d2691e</code>	<code>rgb(210,105,30)</code>









name	hex	RGB
 <code>coral</code>	<code>#ff7f50</code>	<code>rgb(255,127,80)</code>
 <code>cornflowerblue</code>	<code>#6495ed</code>	<code>rgb(100,149,237)</code>
 <code>cornsilk</code>	<code>#fff8dc</code>	<code>rgb(255,248,220)</code>
 <code>crimson</code>	<code>#dc143c</code>	<code>rgb(220,20,60)</code>
 <code>cyan</code>	<code>#00ffff</code>	<code>rgb(0,255,255)</code>
 <code>darkblue</code>	<code>#00008b</code>	<code>rgb(0,0,139)</code>
 <code>darkcyan</code>	<code>#008b8b</code>	<code>rgb(0,139,139)</code>
 <code>darkgoldenrod</code>	<code>#b8860b</code>	<code>rgb(184,134,11)</code>
 <code>darkgray</code>	<code>#a9a9a9</code>	<code>rgb(169,169,169)</code>
 <code>darkgreen</code>	<code>#006400</code>	<code>rgb(0,100,0)</code>
 <code>darkgrey</code>	<code>#a9a9a9</code>	<code>rgb(169,169,169)</code>
 <code>darkkhaki</code>	<code>#bdb76b</code>	<code>rgb(189,183,107)</code>
 <code>darkmagenta</code>	<code>#8b008b</code>	<code>rgb(139,0,139)</code>
 <code>darkolivegreen</code>	<code>#556b2f</code>	<code>rgb(85,107,47)</code>
 <code>darkorange</code>	<code>#ff8c00</code>	<code>rgb(255,140,0)</code>
 <code>darkorchid</code>	<code>#9932cc</code>	<code>rgb(153,50,204)</code>

















Color Index (2)

name	hex	RGB
 darkred	#8b0000	rgb(139,0,0)
 darksalmon	#e9967a	rgb(233,150,122)
 darkseagreen	#8fbc8f	rgb(143,188,143)
 darkslateblue	#483d8b	rgb(72,61,139)
 darkslategray	#2f4f4f	rgb(47,79,79)
 darkslategrey	#2f4f4f	rgb(47,79,79)
 darkturquoise	#00ced1	rgb(0,206,209)
 darkviolet	#9400d3	rgb(148,0,211)
 deeppink	#ff1493	rgb(255,20,147)
 deepskyblue	#00bfff	rgb(0,191,255)
 dimgray	#696969	rgb(105,105,105)
 dimgrey	#696969	rgb(105,105,105)
 dodgerblue	#1e90ff	rgb(30,144,255)
 firebrick	#b22222	rgb(178,34,34)
 floralwhite	#fffaf0	rgb(255,250,240)
 forestgreen	#228b22	rgb(34,139,34)

















name	hex	RGB
 fuchsia	#ff00ff	rgb(255,0,255)
 gainsboro	#dcdcdc	rgb(220,220,220)
 ghostwhite	#f8f8ff	rgb(248,248,255)
 gold	#ffd700	rgb(255,215,0)
 goldenrod	#daa520	rgb(218,165,32)
 gray	#808080	rgb(128,128,128)
 green	#008000	rgb(0,128,0)
 greenyellow	#adff2f	rgb(173,255,47)
 grey	#808080	rgb(128,128,128)
 honeydew	#f0fff0	rgb(240,255,240)
 hotpink	#ff69b4	rgb(255,105,180)
 indianred	#cd5c5c	rgb(205,92,92)
 indigo	#4b0082	rgb(75,0,130)
 ivory	#fffff0	rgb(255,255,240)
 khaki	#f0e68c	rgb(240,230,140)
 lavender	#e6e6fa	rgb(230,230,250)

Color Index (3)

name	hex	RGB
 lavenderblush	#fff0f5	rgb(255,240,245)
 lawngreen	#7cfc00	rgb(124,252,0)
 lemonchiffon	#ffffac	rgb(255,250,205)
 lightblue	#add8e6	rgb(173,216,230)
 lightcoral	#f08080	rgb(240,128,128)
 lightcyan	#e0ffff	rgb(224,255,255)
 lightgoldenrodyellow	#fafad2	rgb(250,250,210)
 lightgray	#d3d3d3	rgb(211,211,211)
 lightgreen	#90ee90	rgb(144,238,144)
 lightgrey	#d3d3d3	rgb(211,211,211)
 lightpink	#ffb6c1	rgb(255,182,193)
 lightsalmon	#ffa07a	rgb(255,160,122)
 lightseagreen	#20b2aa	rgb(32,178,170)
 lightskyblue	#87cefa	rgb(135,206,250)
 lightslategray	#778899	rgb(119,136,153)
 lightslategrey	#778899	rgb(119,136,153)

















name	hex	RGB
 lightsteelblue	#b0c4de	rgb(176,196,222)
 lightyellow	#ffffe0	rgb(255,255,224)
 lime	#00ff00	rgb(0,255,0)
 limegreen	#32cd32	rgb(50,205,50)
 linen	#faf0e6	rgb(250,240,230)
 magenta	#ff00ff	rgb(255,0,255)
 maroon	#800000	rgb(128,0,0)
 mediumaquamarine	#66cdaa	rgb(102,205,170)
 mediumblue	#0000cd	rgb(0,0,205)
 mediumorchid	#ba55d3	rgb(186,85,211)
 mediumpurple	#9370db	rgb(147,112,219)
 mediumseagreen	#3cb371	rgb(60,179,113)
 mediumslateblue	#7b68ee	rgb(123,104,238)
 mediumspringgreen	#00fa9a	rgb(0,250,154)
 mediumturquoise	#48d1cc	rgb(72,209,204)
 mediumvioletred	#c71585	rgb(199,21,133)

Color Index (4)

name	hex	RGB
 midnightblue	#191970	rgb(25,25,112)
 mintcream	#f5fffa	rgb(245,255,250)
 mistyrose	#ffe4e1	rgb(255,228,225)
 moccasin	#ffe4b5	rgb(255,228,181)
 navajowhite	#ffdead	rgb(255,222,173)
 navy	#000080	rgb(0,0,128)
 oldlace	#fdf5e6	rgb(253,245,230)
 olive	#808000	rgb(128,128,0)
 olivedrab	#6b8e23	rgb(107,142,35)
 orange	#ffa500	rgb(255,165,0)
 orangered	#ff4500	rgb(255,69,0)
 orchid	#da70d6	rgb(218,112,214)
 palegoldenrod	#eee8aa	rgb(238,232,170)
 palegreen	#98fb98	rgb(152,251,152)
 paleturquoise	#afeeee	rgb(175,238,238)
 palevioletred	#db7093	rgb(219,112,147)

















name	hex	RGB
 papayawhip	#ffefd5	rgb(255,239,213)
 peachpuff	#ffdab9	rgb(255,218,185)
 peru	#cd853f	rgb(205,133,63)
 pink	#ffc0cb	rgb(255,192,203)
 plum	#dda0dd	rgb(221,160,221)
 powderblue	#b0e0e6	rgb(176,224,230)
 purple	#800080	rgb(128,0,128)
 red	#ff0000	rgb(255,0,0)
 rosybrown	#bc8f8f	rgb(188,143,143)
 royalblue	#4169e1	rgb(65,105,225)
 saddlebrown	#8b4513	rgb(139,69,19)
 salmon	#fa8072	rgb(250,128,114)
 sandybrown	#f4a460	rgb(244,164,96)
 seagreen	#2e8b57	rgb(46,139,87)
 seashell	#fff5ee	rgb(255,245,238)
 sienna	#a0522d	rgb(160,82,45)







Color Index (5)

name	hex	RGB
 silver	#c0c0c0	rgb(192,192,192)
 skyblue	#87ceeb	rgb(135,206,235)
 slateblue	#6a5acd	rgb(106,90,205)
 slategray	#708090	rgb(112,128,144)
 slategrey	#708090	rgb(112,128,144)
 snow	#fffafa	rgb(255,250,250)
 springgreen	#00ff7f	rgb(0,255,127)
 steelblue	#4682b4	rgb(70,130,180)
 tan	#d2b48c	rgb(210,180,140)
 teal	#008080	rgb(0,128,128)
 thistle	#d8bfd8	rgb(216,191,216)
 tomato	#ff6347	rgb(255,99,71)
 turquoise	#40e0d0	rgb(64,224,208)
 violet	#ee82ee	rgb(238,130,238)
 wheat	#f5deb3	rgb(245,222,179)
 white	#ffffff	rgb(255,255,255)

name	hex	RGB
 whitesmoke	#f5f5f5	rgb(245,245,245)
 yellow	#ffff00	rgb(255,255,0)
 yellowgreen	#9acd32	rgb(154,205,50)

Neutrals

name	hex	RGB
 aliceblue	#f0f8ff	rgb(240,248,255)
 antiquewhite	#faebd7	rgb(250,235,215)
 azure	#f0ffff	rgb(240,255,255)
 beige	#f5f5dc	rgb(245,245,220)
 bisque	#ffe4c4	rgb(255,228,196)
 black	#000000	rgb(0,0,0)
 blanchedalmond	#ffebcd	rgb(255,235,205)
 brown	#a52a2a	rgb(165,42,42)
 burlywood	#deb887	rgb(222,184,135)
 chocolate	#d2691e	rgb(210,105,30)
 cornsilk	#fff8dc	rgb(255,248,220)
 darkgray	#a9a9a9	rgb(169,169,169)
 darkgrey	#a9a9a9	rgb(169,169,169)
 darksalmon	#e9967a	rgb(233,150,122)
 darkslategray	#2f4f4f	rgb(47,79,79)
 darkslategrey	#2f4f4f	rgb(47,79,79)

















name	hex	RGB
 dimgray	#696969	rgb(105,105,105)
 dimgrey	#696969	rgb(105,105,105)
 floralwhite	#fffaf0	rgb(255,250,240)
 gainsboro	#dcdcdc	rgb(220,220,220)
 ghostwhite	#f8f8ff	rgb(248,248,255)
 gray	#808080	rgb(128,128,128)
 grey	#808080	rgb(128,128,128)
 honeydew	#f0fff0	rgb(240,255,240)
 ivory	#fffff0	rgb(255,255,240)
 lavender	#e6e6fa	rgb(230,230,250)
 lavenderblush	#fff0f5	rgb(255,240,245)
 lightgray	#d3d3d3	rgb(211,211,211)
 lightgrey	#d3d3d3	rgb(211,211,211)
 lightslategray	#778899	rgb(119,136,153)
 lightslategrey	#778899	rgb(119,136,153)
 linen	#faf0e6	rgb(250,240,230)


Neutrals (2)

name	hex	RGB
 mintcream	#f5fffa	rgb(245,255,250)
 mistyrose	#ffe4e1	rgb(255,228,225)
 moccasin	#ffe4b5	rgb(255,228,181)
 navajowhite	#ffdead	rgb(255,222,173)
 oldlace	#fdf5e6	rgb(253,245,230)
 papayawhip	#ffefd5	rgb(255,239,213)
 peachpuff	#ffdab9	rgb(255,218,185)
 peru	#cd853f	rgb(205,133,63)
 rosybrown	#bc8f8f	rgb(188,143,143)
 saddlebrown	#8b4513	rgb(139,69,19)
 salmon	#fa8072	rgb(250,128,114)
 sandybrown	#f4a460	rgb(244,164,96)
 seashell	#fff5ee	rgb(255,245,238)
 sienna	#a0522d	rgb(160,82,45)
 silver	#c0c0c0	rgb(192,192,192)
 slategray	#708090	rgb(112,128,144)

















name	hex	RGB
 slategray	#708090	rgb(112,128,144)
 snow	#ffaafa	rgb(255,250,250)
 tan	#d2b48c	rgb(210,180,140)
 wheat	#f5deb3	rgb(245,222,179)
 white	#ffffff	rgb(255,255,255)
 whitesmoke	#f5f5f5	rgb(245,245,245)








Reds

name	hex	RGB
 coral	#ff7f50	rgb(255,127,80)
 crimson	#dc143c	rgb(220,20,60)
 darkmagenta	#8b008b	rgb(139,0,139)
 darkred	#8b0000	rgb(139,0,0)
 deeppink	#ff1493	rgb(255,20,147)
 firebrick	#b22222	rgb(178,34,34)
 fuchsia	#ff00ff	rgb(255,0,255)
 hotpink	#ff69b4	rgb(255,105,180)
 indianred	#cd5c5c	rgb(205,92,92)
 lightcoral	#f08080	rgb(240,128,128)
 lightpink	#ffb6c1	rgb(255,182,193)
 lightsalmon	#ffa07a	rgb(255,160,122)
 magenta	#ff00ff	rgb(255,0,255)
 maroon	#800000	rgb(128,0,0)
 orangered	#ff4500	rgb(255,69,0)
 orchid	#da70d6	rgb(218,112,214)

name	hex	RGB
 palevioletred	#db7093	rgb(219,112,147)
 pink	#ffc0cb	rgb(255,192,203)
 plum	#dda0dd	rgb(221,160,221)
 red	#ff0000	rgb(255,0,0)
 thistle	#d8bfd8	rgb(216,191,216)
 tomato	#ff6347	rgb(255,99,71)


Greens

name	hex	RGB
 aquamarine	#7fffd4	rgb(127,255,212)
 chartreuse	#7fff00	rgb(127,255,0)
 darkgreen	#006400	rgb(0,100,0)
 darkkhaki	#bdb76b	rgb(189,183,107)
 darkolivegreen	#556b2f	rgb(85,107,47)
 darkseagreen	#8fbc8f	rgb(143,188,143)
 forestgreen	#228b22	rgb(34,139,34)
 green	#008000	rgb(0,128,0)
 greenyellow	#adff2f	rgb(173,255,47)
 lawngreen	#7cfc00	rgb(124,252,0)
 lightgreen	#90ee90	rgb(144,238,144)
 lightseagreen	#20b2aa	rgb(32,178,170)
 lime	#00ff00	rgb(0,255,0)
 limegreen	#32cd32	rgb(50,205,50)
 mediumseagreen	#3cb371	rgb(60,179,113)
 mediumspringgreen	#00fa9a	rgb(0,250,154)







name	hex	RGB
 olive	#808000	rgb(128,128,0)
 olivedrab	#6b8e23	rgb(107,142,35)
 palegreen	#98fb98	rgb(152,251,152)
 seagreen	#2e8b57	rgb(46,139,87)
 springgreen	#00ff7f	rgb(0,255,127)
 teal	#008080	rgb(0,128,128)
 yellowgreen	#9acd32	rgb(154,205,50)

Blues












name	hex	RGB
 aqua	#00ffff	rgb(0,255,255)
 blue	#0000ff	rgb(0,0,255)
 cadetblue	#5f9ea0	rgb(95,158,160)
 cornflowerblue	#6495ed	rgb(100,149,237)
 cyan	#00ffff	rgb(0,255,255)
 darkblue	#00008b	rgb(0,0,139)
 darkcyan	#008b8b	rgb(0,139,139)
 darkslateblue	#483d8b	rgb(72,61,139)
 darkturquoise	#00ced1	rgb(0,206,209)
 deepskyblue	#00bfff	rgb(0,191,255)
 dodgerblue	#1e90ff	rgb(30,144,255)
 lightblue	#add8e6	rgb(173,216,230)
 lightcyan	#e0ffff	rgb(224,255,255)
 lightskyblue	#87cefa	rgb(135,206,250)
 lightsteelblue	#b0c4de	rgb(176,196,222)
 mediumaquamarine	#66cdaa	rgb(102,205,170)

name	hex	RGB
 mediumblue	#0000cd	rgb(0,0,205)
 mediumslateblue	#7b68ee	rgb(123,104,238)
 mediumturquoise	#48d1cc	rgb(72,209,204)
 midnightblue	#191970	rgb(25,25,112)
 navy	#000080	rgb(0,0,128)
 paleturquoise	#afeeee	rgb(175,238,238)
 powderblue	#b0e0e6	rgb(176,224,230)
 royalblue	#4169e1	rgb(65,105,225)
 skyblue	#87ceeb	rgb(135,206,235)
 slateblue	#6a5acd	rgb(106,90,205)
 steelblue	#4682b4	rgb(70,130,180)
 turquoise	#40e0d0	rgb(64,224,208)

Violets

	name	hex	RGB
	blueviolet	#8a2be2	rgb(138,43,226)
	darkorchid	#9932cc	rgb(153,50,204)
	darkviolet	#9400d3	rgb(148,0,211)
	indigo	#4b0082	rgb(75,0,130)
	mediumorchid	#ba55d3	rgb(186,85,211)
	mediumpurple	#9370db	rgb(147,112,219)
	mediumvioletred	#c71585	rgb(199,21,133)
	purple	#800080	rgb(128,0,128)
	violet	#ee82ee	rgb(238,130,238)

Yellows

name	hex	RGB
 darkgoldenrod	#b8860b	rgb(184,134,11)
 darkorange	#ff8c00	rgb(255,140,0)
 gold	#ffd700	rgb(255,215,0)
 goldenrod	#daa520	rgb(218,165,32)
 khaki	#f0e68c	rgb(240,230,140)
 lemonchiffon	#ffffac	rgb(255,250,205)
 lightgoldenrodyellow	#fafad2	rgb(250,250,210)
 lightyellow	#ffffe0	rgb(255,255,224)
 orange	#ffa500	rgb(255,165,0)
 palegoldenrod	#eee8aa	rgb(238,232,170)
 yellow	#ffff00	rgb(255,255,0)

Object Index

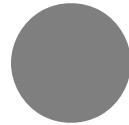
Text

hello, world

The quick brown
fox jumped over
the lazy dog

what's up, Doc?

Graphics



Images



sky

Lists

- First
- Second
- Third

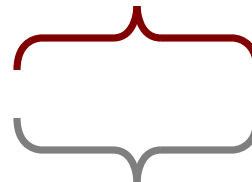
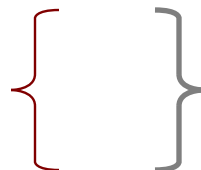
1. First
2. Second
3. Third

- First
Second
Third

Arrows



Braces



Textual Elements

description	keyword	mandatory	optional
Left-aligned	text	"..." x y fontsize	font color op link
Centered	ctext	"..." x y fontsize	font color op link
End-aligned	etext	"..." x y fontsize	font color op link
Rotated	rtext	"..." x y angle fontsize	font color op link
Text on an arc	arctext	"..." x y rad a1 a2 fontsize	font color op link
Block text	textblock	"..." x y w fontsize	font color op link
File contents	textfile	"file" x y fontsize	font color op spacing
Code listing	textcode	"file" x y w fontsize	font color

hello, world

(x,y)

`text "..."` `x y` `fontsize` `font` `color` `op` `link`

abc

```
text "abc" 20 20 4
```

abc

```
text "abc" 75 20 7 "mono" "maroon"
```

hello, world

(x,y)

`ctext "..."` `x y` `fontsize` `font` `color` `op` `link`

abc

`ctext "abc" 20 20 4`

abc

`ctext "abc" 80 20 7 "mono" "maroon"`

hello, world.

(x,y)

`etext "..."` `x y` `fontsize` `font` `color` `op` `link`

abc

`etext "abc" 20 20 4`

abc

`etext "abc" 80 20 7 "mono" "maroon"`

hello, world

(x,y)

rttext "... " x y angle fontsize font color op link

abc

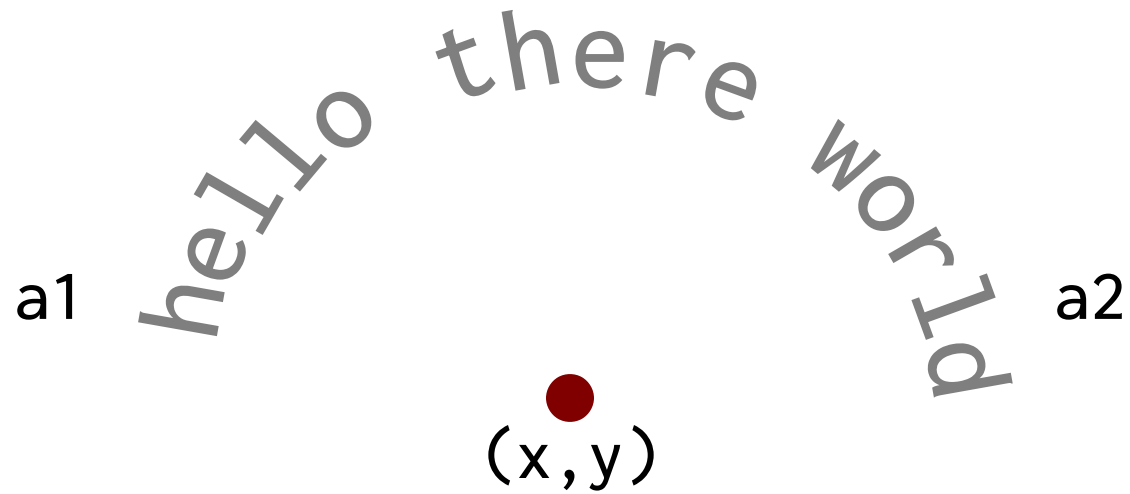
ctext 20 20 30 3

abc

ctext 50 20 90 5

abc

ctext 80 20 270 4 "sans" "maroon"



```
arctext "... " x y radius a1 a2 fontsize font color op link
```

What is up

This is curvy

```
arctext "What is up" 25 20 10 180 90 3 "mono"
```

```
arctext "This is curvy" 75 30 10 180 360 3 "mono"
```

(x, y)  “Where justice is denied, where poverty is enforced,
where ignorance prevails, and where any one class
is made to feel that society is an organized conspiracy
to oppress, rob and degrade them, neither persons
nor property will be safe.”

textblock "... " x y w fontsize font color op link

“Where justice is denied, where poverty is enforced,
where ignorance prevails, and where any one class
is made to feel that society is an organized conspiracy
to oppress, rob and degrade them, neither persons
nor property will be safe.”

textblock "... " 10 35 30 2

“Where justice is denied,
where poverty is enforced,
where ignorance prevails,
and where any one class is
made to feel that society
is an organized conspiracy
to oppress, rob and degrade
them, neither persons nor
property will be safe.”

textblock "... " 50 35 10 1 "sans" "maroon"

(x,y) This is the contents
of a file. it has lines of text.
Reading is fundamental.

`textfile "..."` `x y` `fontsize` `font color` `op link`

This is the contents
of a file. it has lines of text.
Reading is fundamental.

`textfile "example.txt" 10 35 2`

```
package main
```

```
import "fmt"
```

```
func main() {
```

```
    fmt.Println("hello, world")
```

```
}
```

```
textfile "hw.go" 55 35 1.6 "mono" "maroon"
```

(x,y)

W

```
package main

import "fmt"

func main() {
    fmt.Println("hello, world")
}
```

textcode "... " x y w fontsize font color

```
package main

import "fmt"

func main() {
    fmt.Println("hello, world")
}
```

textcode "hw.go" 10 35 25 1.0

```
package main

import "fmt"

func main() {
    fmt.Println("hello, world")
}
```

textcode "hw.go" 55 35 40 1.6 "maroon"

Graphical Elements

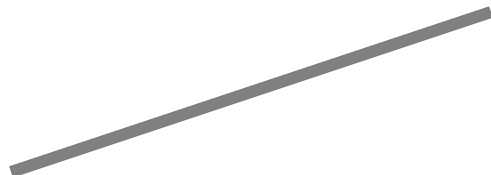
description	keyword	mandatory	optional
Line	line	x1 y1 x2 y2 lw	color op
Horizontal line	hline	x y w	lw color op
Vertical line	vline	x y h	lw color op
Elliptical arc	arc	x y w h a1 a2	lw color op
Quadratic Bezier	curve	bx by cx cy ex ey	lw color op
Circle	circle	x y w	color op
Area circle	acircle	x y area	color op
Ellipse	ellipse	x y w h	color op
Square	square	x y w	color op
Rectangle	rect	x y w h	color op
Rounded rectangle	rrect	x y w h radius	color
Pill shape	pill	x y w h	color
Polygon	polygon	"x1 x2...xn" "y1 y2...yn"	color op
N-sided star	star	x y sides inner outer	color op

lw { 
(x1,y1) (x2,y2)

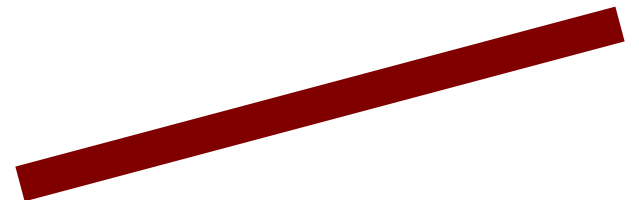
line x1 y1 x2 y2 lw color op



line 10 20 30 20



line 40 20 60 30 0.5



line 70 20 95 30 1.5 "maroon"



```
hline x y w lw color op
```



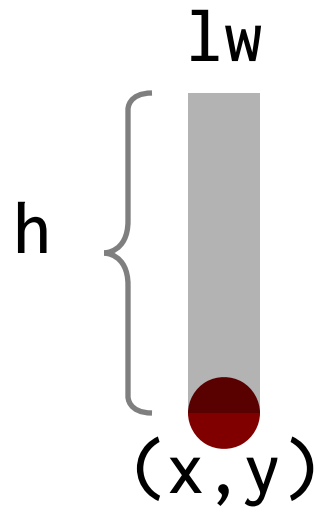
```
hline 15 20 10
```



```
hline 40 20 20 1
```



```
hline 70 20 20 5 "maroon" 20
```



`vline` `x` `y` `w` `lw` `color` `op`



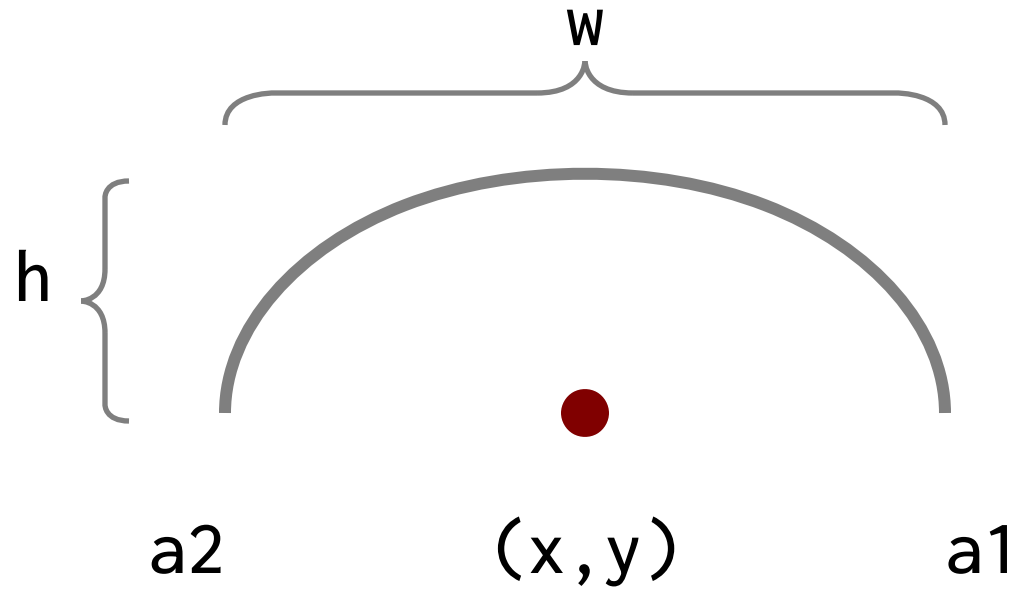
`vline 20 20 15`



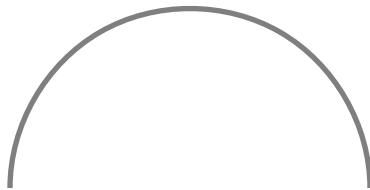
`vline 50 20 15 2`



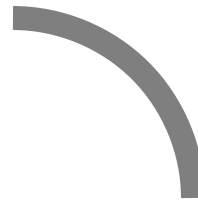
`vline 80 20 15 10 "maroon" 20`



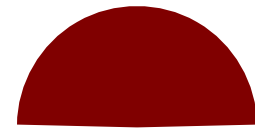
`arc x y w h a1 a2 lw color op`



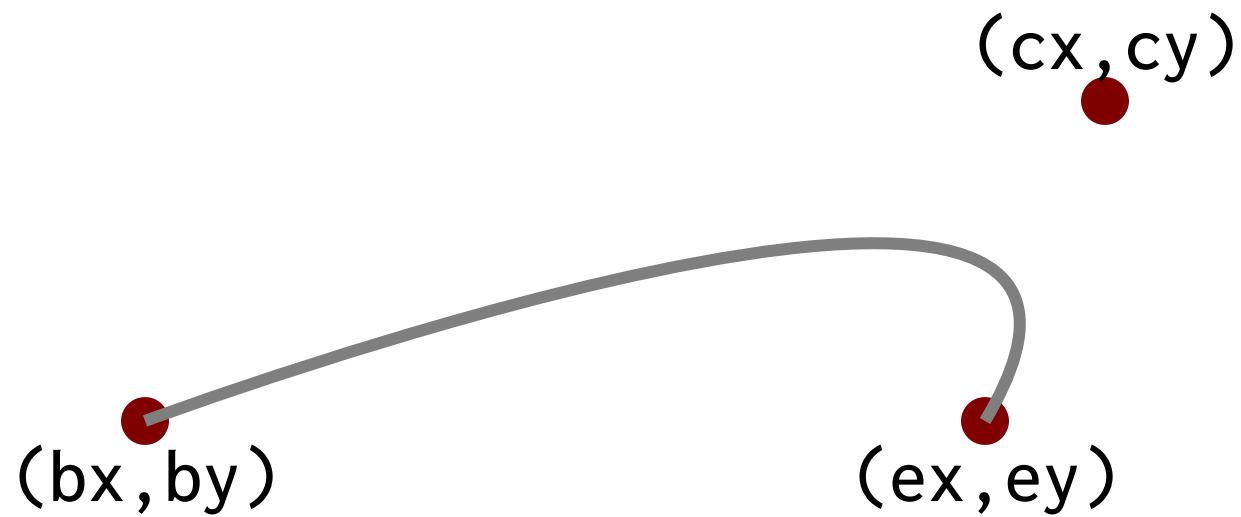
`arc 20 20 15 15 0 180`



`arc 50 20 15 15 0 90 1`



`arc 80 20 5 5 0 180 5 "maroon"`



`curve` `bx` `by` `cx` `cy` `ex` `ey` `lw` `color` `op`



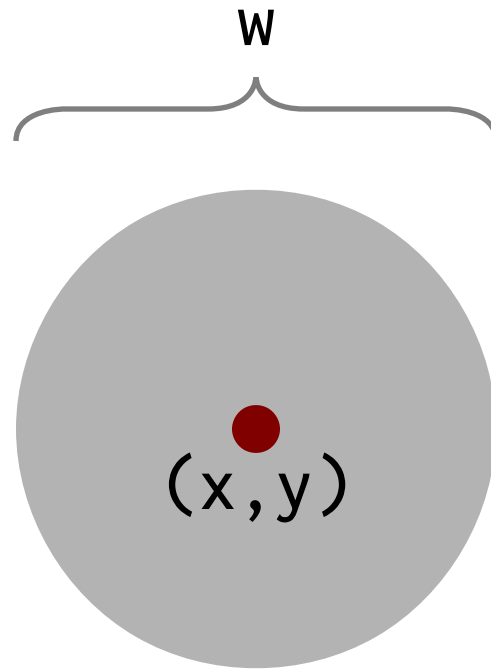
`curve 15 20 25 30 30 25`



`curve 15 20 25 30 30 25`



`curve 70 20 70 30 90 25 0.5 "maroon"`



`circle x y w color op`



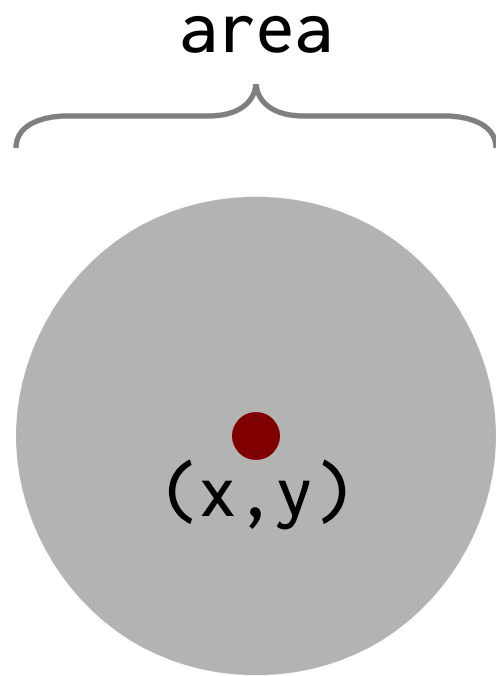
`circle 20 20 10`



`circle 50 20 10 "maroon"`



`circle 80 20 5 "maroon" 20`



circle x y area color op



acircle 20 20 10



acircle 50 20 10 "maroon"



acircle 80 20 5 "maroon" 20



`ellipse x y w h color op`



`ellipse 20 20 10 5`



`ellipse 50 20 10 5 "maroon"`



`ellipse 80 20 5 10 "maroon" 20`



`square x y w color op`



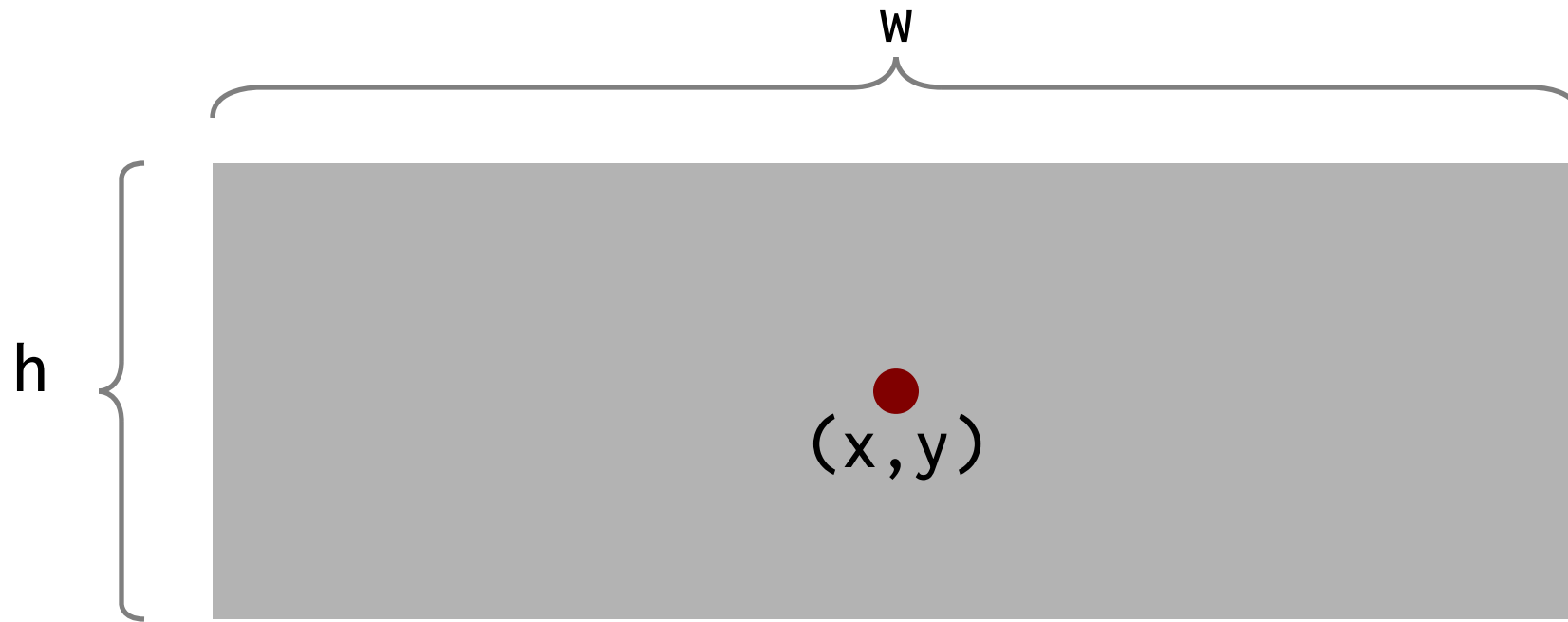
`square 20 20 10`



`square 50 20 10 "maroon"`



`square 80 20 5 "maroon" 20`



`rect x y w h color op`



`rect 20 20 10 5`



`rect 50 20 10 5 "maroon"`



`rect 80 20 5 10 "maroon" 20`



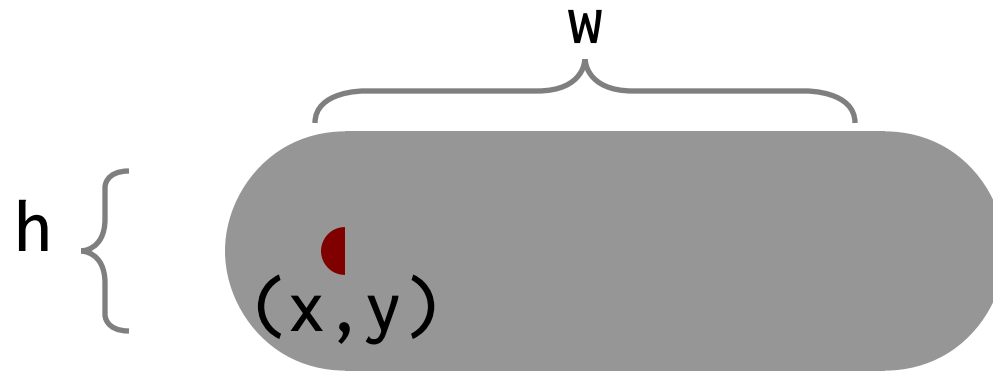
`rrect x y w h radius color op`



`rrect 20 20 10 5 1`



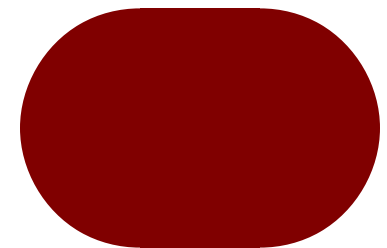
`rrect 80 20 5 10 1 "maroon"`



`pill x y w h color`



`pill 20 20 10 5`



`pill 80 20 5 10 "maroon"`



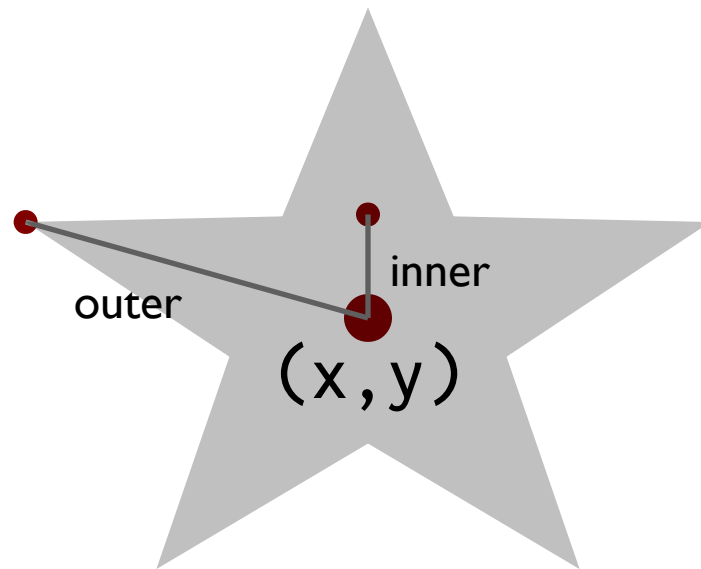
`polygon x1 x2...xn" "y1 y2...yn color op`



`polygon "10 25 20" "20 30 20"`



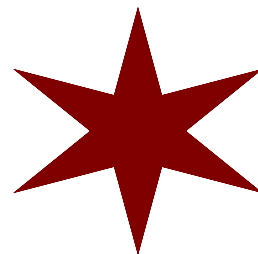
`polygon "70 85 90" "20 30 20" "maroon"`



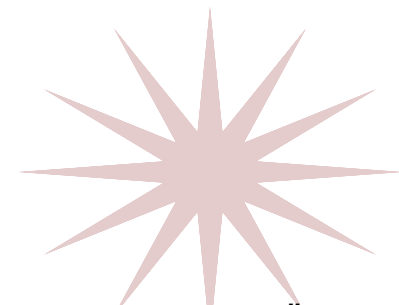
`star x y sides inner outer color op`



`star 20 20 5 2 6`



`star 50 20 12 2 5 "maroon"`



`star 80 ey 24 2 8 "maroon" 20`

Images

description	keyword	mandatory	optional
Image	<code>image</code>	<code>"file" x y w h</code>	<code>scale "link"</code>
Captioned image	<code>cimage</code>	<code>"file" "caption" x y w h</code>	<code>scale "link"</code>

Note: the scale value is a percentage from 1-100, and link is a URL

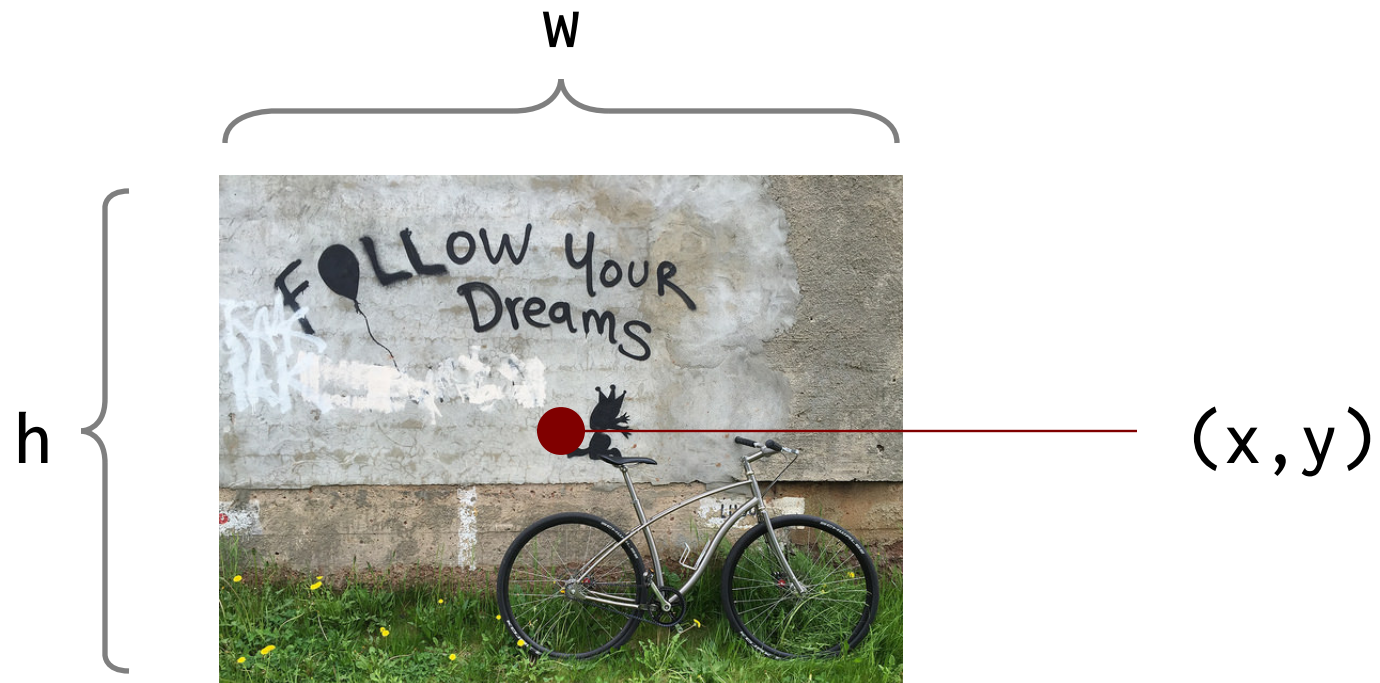


image x y w h scale link



image "follow.jpg" 20 25 640 480 10

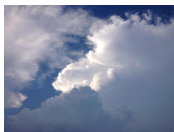


image "follow.jpg" 75 25 640 480 30



sky

`cimage x y w h scale link`



sky



sky

`cimage "cloudy.jpg" "sky" 20 25 640 480 10`

`cimage "cloudy.jpg" "sky" 75 25 640 480 30 "" 1.5`

Lists

description	keyword	mandatory	optional
Plain list	<code>list</code>	<code>x y fontsize</code>	<code>font color op spacing</code>
Bullet list	<code>blist</code>	<code>x y fontsize</code>	<code>font color op spacing</code>
Numbered list	<code>nlist</code>	<code>x y fontsize</code>	<code>font color op spacing</code>
Centered list	<code>clist</code>	<code>x y fontsize</code>	<code>font color op spacing</code>

```
list x y fs
(x,y) li "first"
      li "second"
      li "third"
elist
```

list x y fontsize font color op spacing

```
list 20 30 2.5 one
      li "one"
      li "two" two
      li "three" three
elist
```

```
list 85 30 4 "serif" "maroon" 100 1.0
      li "one"
      li "two"
      li "three"
elist
```

one
two
three

```
      ● blist x y fs
(x,y)  li "first"
        li "second"
        li "third"
      elist
```

blist x y fontsize font color op spacing

```
blist 20 30 2.5 ● one
  li "one"
  li "two" ● two
  li "three" ● three
elist
```

```
blist 85 30 4 "serif" "maroon" 100 1.0
  li "one"
  li "two"
  li "three"
elist
```

● *one*
● *two*
● *three*

```
nlist x y fs
(x,y) li "first"
      li "second"
      li "third"
elist
```

nlist x y fontsize font color op spacing

```
nlist 20 30 2.5 |. one
  li "one"
  li "two"
  li "three"
elist
```

1. one
2. two
3. three

```
nlist 85 30 4 "serif" "maroon" 100 1.0
  li "one"
  li "two"
  li "three"
elist
```

1. one
2. two
3. three

```
clist x y fs
(x,y) li "first"
      li "second"
      li "third"
elist
```

clist x y fontsize font color op spacing

```
clist 30 30 2.5
  li "first one"
  li "next"
  li "and last"
elist
```

first one
next
and last

```
clist 90 30 4 "serif" "maroon" 100 1.0
  li "first"
  li "next"
  li "and last"
elist
```

first
next
and last

Arrows

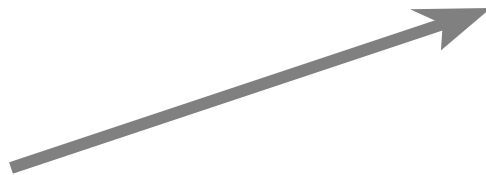
description	keyword	mandatory	optional
Straight	<code>arrow</code>	<code>x1 y1 x2 y2</code>	<code>lw aw ah color op</code>
Left curved	<code>lcarrow</code>	<code>bx by cx cy ex ey</code>	<code>lw aw ah color op</code>
Right curved	<code>rcarrow</code>	<code>bx by cx cy ex ey</code>	<code>lw aw ah color op</code>
Up curved	<code>ucarrow</code>	<code>bx by cx cy ex ey</code>	<code>lw aw ah color op</code>
Down curved	<code>dcarrow</code>	<code>bx by cx cy ex ey</code>	<code>lw aw ah color op</code>



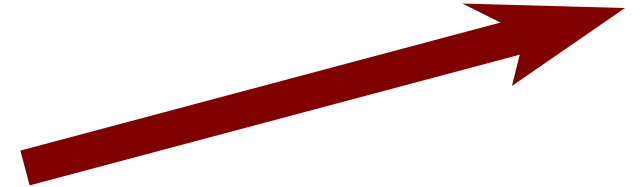
`arrow x1 y1 x2 y2 lw aw ah color op`



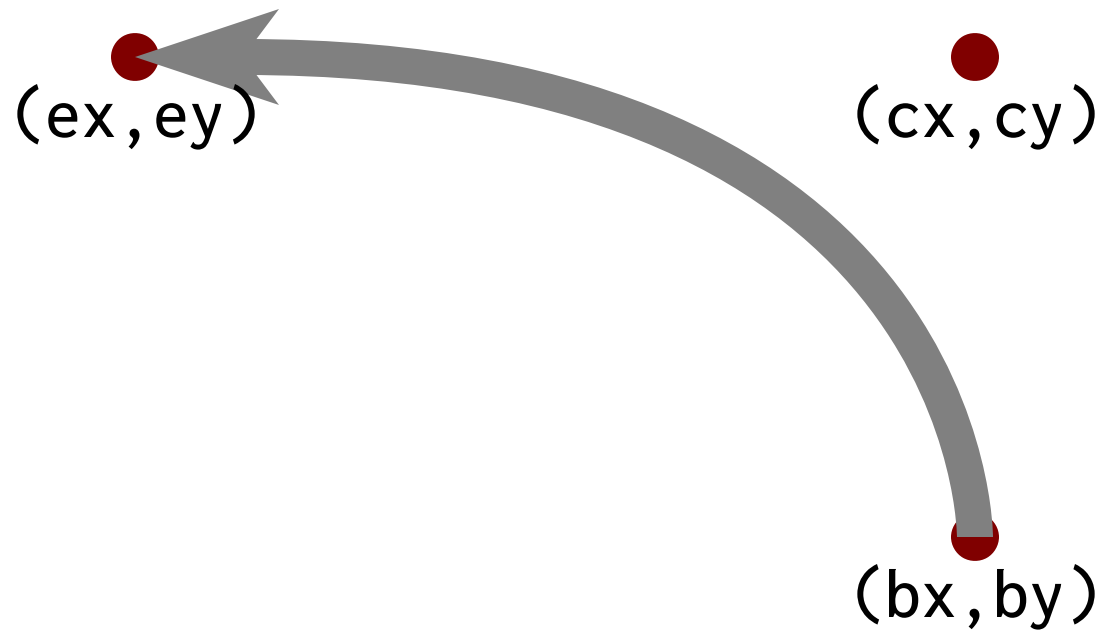
`arrow 10 20 30 20`



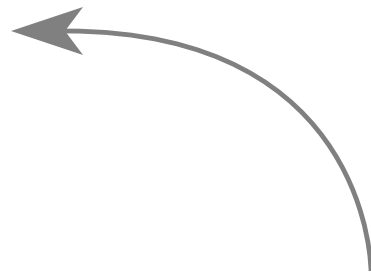
`arrow 40 20 60 30 0.5`



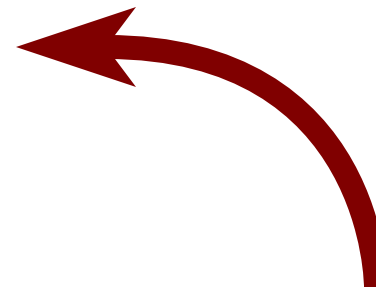
`arrow 70 20 95 30 1.5 6 6 "maroon"`



`lcarrow bx by cx cy ex ey lw aw ah color op`



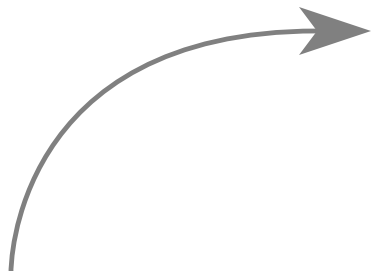
`lcarrow 30 20 30 35 15 35`



`lcarrow 70 20 70 35 55 35 1 5 5 "maroon"`



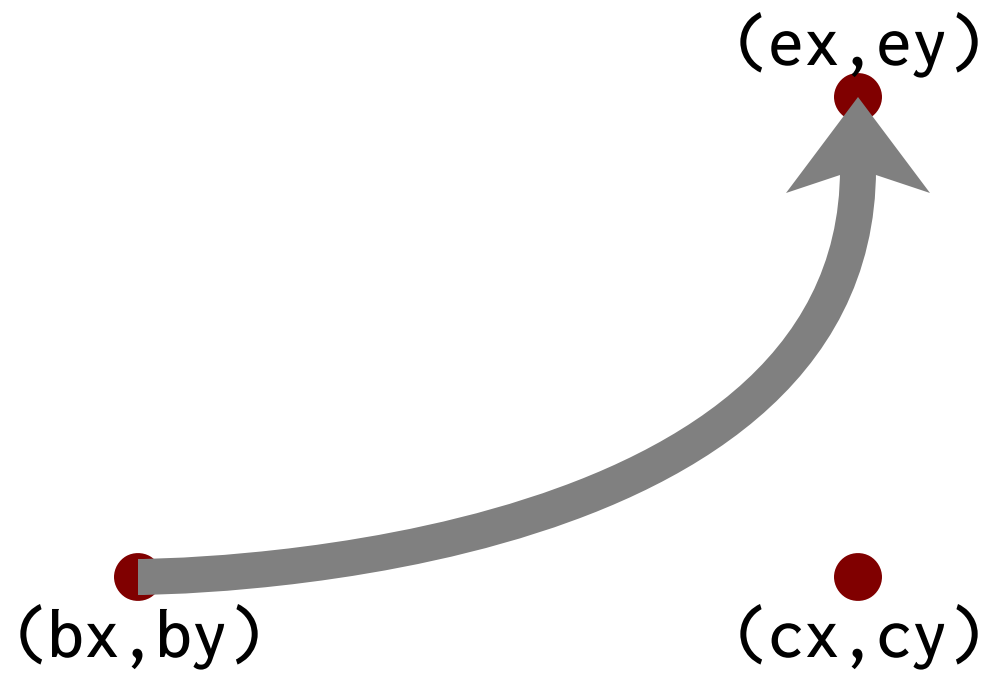
`rcarrow bx by cx cy ex ey lw aw ah color op`



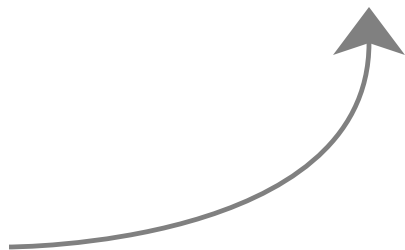
`rcarrow 15 20 15 35 30 35`



`rcarrow 50 20 50 35 70 35 1 5 5 "maroon"`



`ucarrow` `bx` `by` `cx` `cy` `ex` `ey` `lw` `aw` `ah` `color` `op`



`ucarrow 15 20 30 20 30 35`



`rcarrow 50 20 70 20 70 35 1 5 5 "maroon"`

(bx, by)

(cx, cy)

(ex, ey)

`dcarrow bx by cx cy ex ey lw aw ah color op`



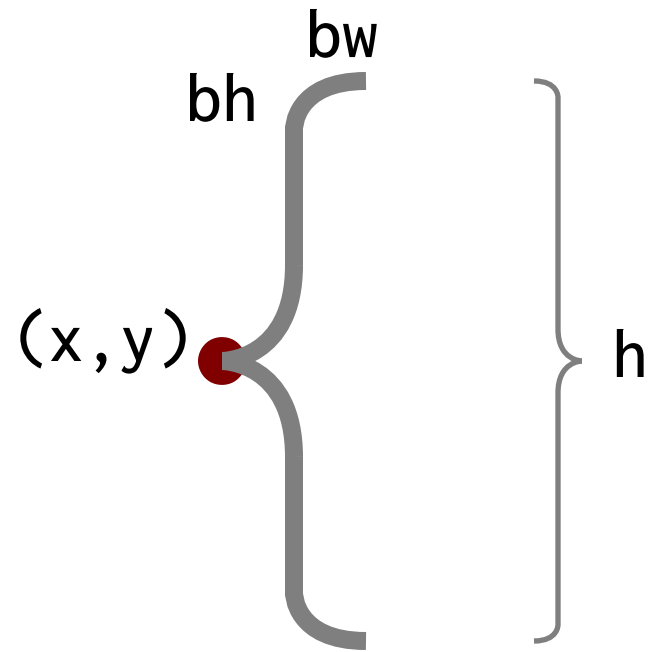
`dcarrow 15 35 30 30 20`



`dcarrow 50 35 70 35 70 20 1 5 5 "maroon"`

Braces

description	keyword	mandatory	optional
Left brace	lbrace	x y fontsize bw bh	lw color op
Right brace	rbrace	x y fontsize bw bh	lw color op
Up brace	ubrace	x y fontsize bw bh	lw color op
Down brace	dbrace	x y fontsize bw bh	lw color op



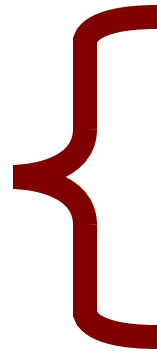
`lbrace` *x* *y* *fontsize* *bw* *bh* *lw* *color* *op*



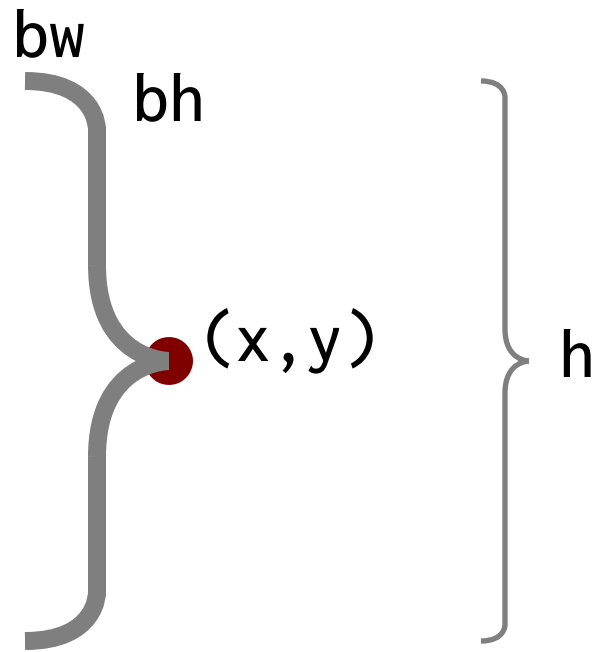
`lbrace 20 25 20 2 2`



`lbrace 50 25 20 4 4 1`



`lbrace 80 25 20 6 3 1 "maroon"`



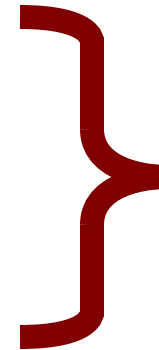
`rbrace` x y `fontsize` `bw` `bh` `lw` `color` `op`



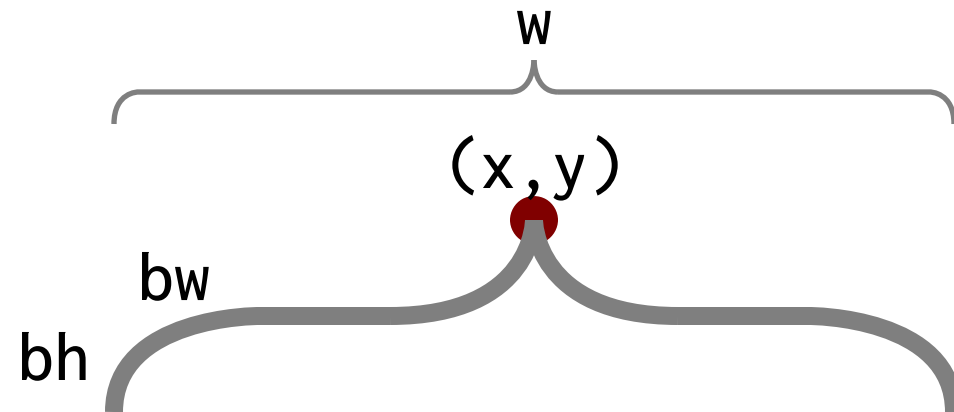
`rbrace 20 25 20 2 2`



`rbrace 50 25 20 4 4 1`



`rbrace 80 25 20 6 3 1 "maroon"`



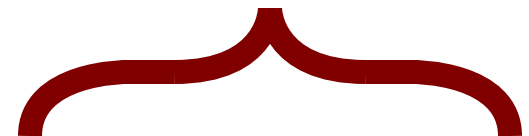
`ubrace x y fontsize bw bh lw color op`



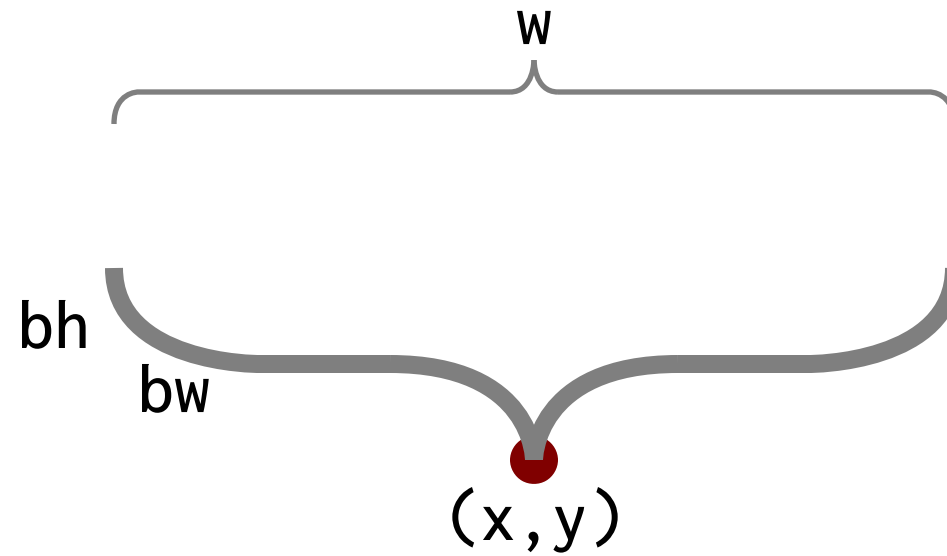
`ubrace 20 25 20 2 2`



`ubrace 50 25 20 4 4 1`



`ubrace 80 25 20 4 4 1 "maroon"`



`dbrace x y fontsize bw bh lw color op`



`dbrace 20 25 20 2 2`



`dbrace 50 25 20 4 4 1`



`dbrace 80 25 20 4 4 1 "maroon"`

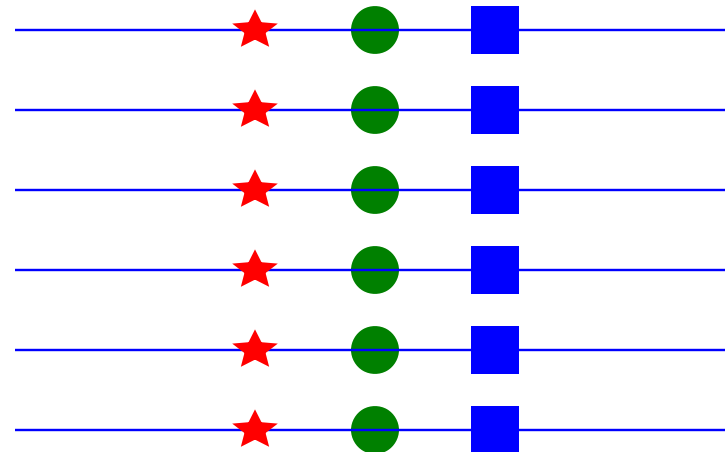
Loop, Built-ins, Data, Function and Grid

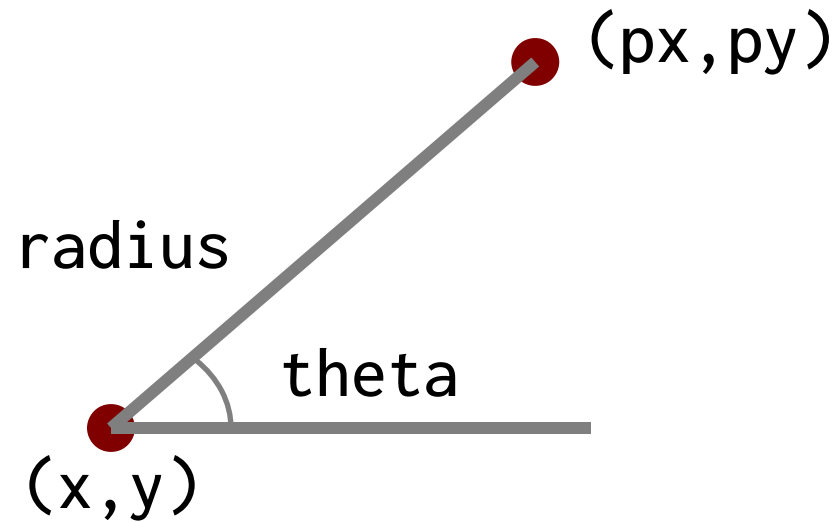
description	keyword	mandatory
Loop	<code>for v=</code>	<code>begin end [increment] ... efor</code>
Polar coordinate (x)	<code>x=polarx</code>	<code>x y radius angle</code>
Polar coordinate (y)	<code>y=polary</code>	<code>x y radius angle</code>
Area	<code>value=area</code>	<code>expression</code>
Formatted text	<code>value=format</code>	<code>fmt expression</code>
Random number	<code>value=random</code>	<code>min max</code>
Square Root	<code>value=sqrt</code>	<code>expression</code>
Value mapping	<code>value=vmap</code>	<code>data min1 max1 min2 max2</code>
Functions	<code>func</code>	<code>"file" arg1 ... argn</code>
In-line data	<code>data</code>	<code>"file" ... edata</code>
Objects on a grid	<code>grid</code>	<code>"file" x y hspace vspace edge</code>

```
for v=begin end [increment]  
...items to repeat using v  
efor
```

```
for v=begin end increment ...efor
```

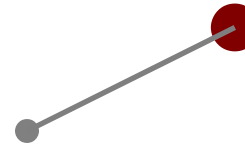
```
for v=10 35 5  
  hline 50 v 30 0.1 "blue"  
  star 60 v 5 1 0.4 "red"  
  circle 65 v 2 "green"  
  square 70 v 2 "blue"  
efor
```





```
px=polarx x y radius theta  
py=polar y x y radius theta
```

```
cpx=60  
cpy=20  
px1=polarx cpx cpy 10 30  
py1=polar y cpx cpy 10 30  
line cpx cpy px1 py1  
circle cpx cpy 1 "gray"  
circle px1 py1 2 "maroon"
```



v=123.45

a=area v



area



original value

value=**area** expression

```
m1=100
```

```
m2=200
```

```
a1=area m1
```

```
a2=area m2
```

```
circle 60 20 a1 "maroon"
```

```
circle 80 20 a2
```



x=3.14159

y=2.0

title=format "Value=%.2f" x*y
Value=6.28 format string expression

value=format fmt expression

v1=100.3

v2=200.234

title=format "%.2f Million (USD)" v1

subtitle=format "Total value: %.2f" v1+v2

ctext title 80 30 4 "sans" "maroon"

ctext subtitle 80 20 3 "sans" "gray"

100.30 Million (USD)

Total value: 300.53



value=random min max



```
rx1=random 5 30  
ry1=random 15 35  
circle rx1 ry1 3 "maroon"
```

```
rx2=random 40 60  
ry2=random 15 35  
circle rx2 ry2 3 "green"
```

```
rx1=random 75 95  
ry1=random 15 35  
circle rx3 ry3 3 "blue"
```


a=10

b=71

x=sqrt 4

← x = 2

y=sqrt a

← y = 3.1622776

n=sqrt a+b

← n = 9

value=**sqrt** number or expression

```
a_squared=10*10
```

```
b_squared=20*20
```

```
c=sqrt a_squared + b_squared
```

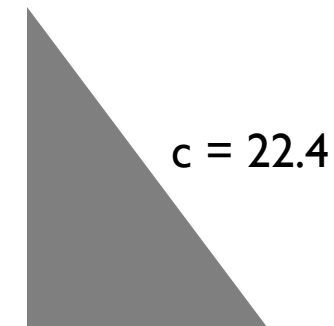
```
w=70+10
```

```
h=15+20
```

```
polygon "70 w 70" "15 15 h"
```

```
clabel=format "c = %.1f" c
```

```
text clabel 76 25 2
```





`value=vmap data min1 max1 min2 max2`

```
yrmin=1776
yrmax=2021
smin=60
smax=90
vp=vmap 1945 yrmin yrmax smin smax
line smin 20 smax 20 0.5 "gray" 20
circle smin 20 1
circle smax 20 1
circle vp 20 2 "maroon"
```



```
func "doit.dsh" 50 20 2.5 "hello"
```

doit.dsh

```
fx fy fs ft  
ctext ft fx fy fs "serif" "purple"
```



result

```
fx=50  
fy=20  
fs=2.5  
ft="hello"  
ctext ft fx fy fs "serif" "purple"
```

```
func "file" arg1 ... argn
```

*calling the function
call again*

```
func "foo.dsh" 50 30 5 "calling the function"  
func "foo.dsh" 50 20 4 "call again"
```

```
data "file.d" ← data file
first 20
second 100
third 200
edata
```

} data values

```
data "file" ... edata
```

```
data "test.d"
  one 100
  two 200
  three 300
  four 400
  five 500
```

```
edata
```

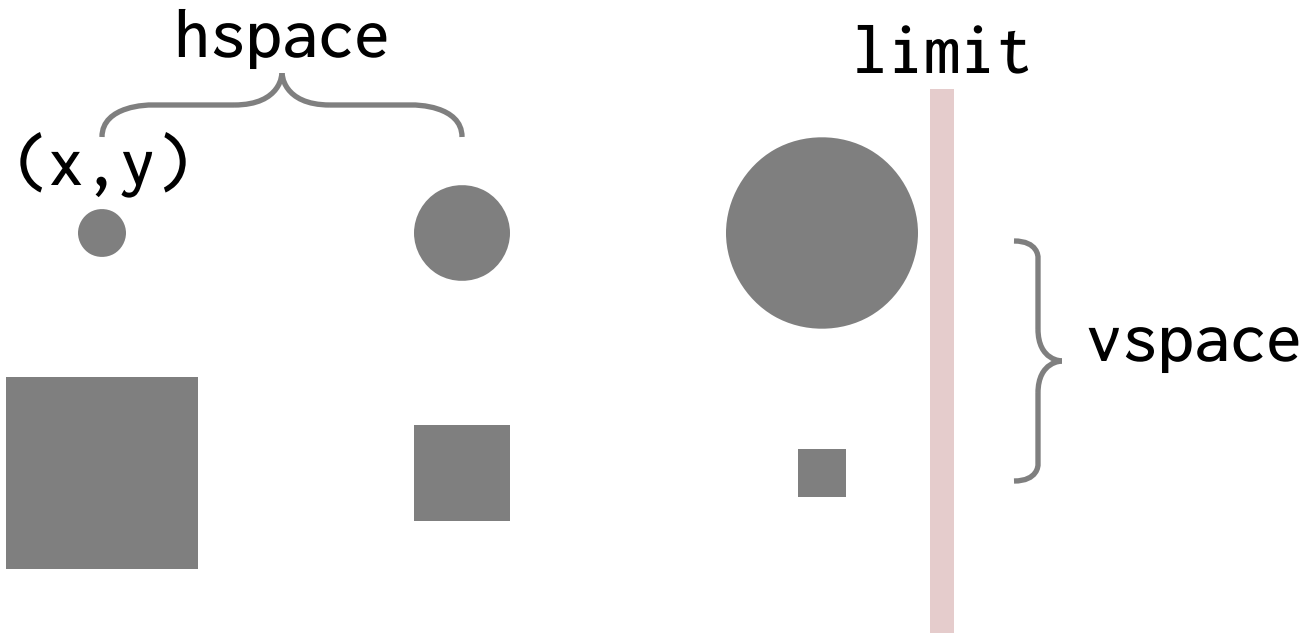
```
dchart -bar -left 50 -bottom 15 -right 70 -top 35 "test.d"
```



file

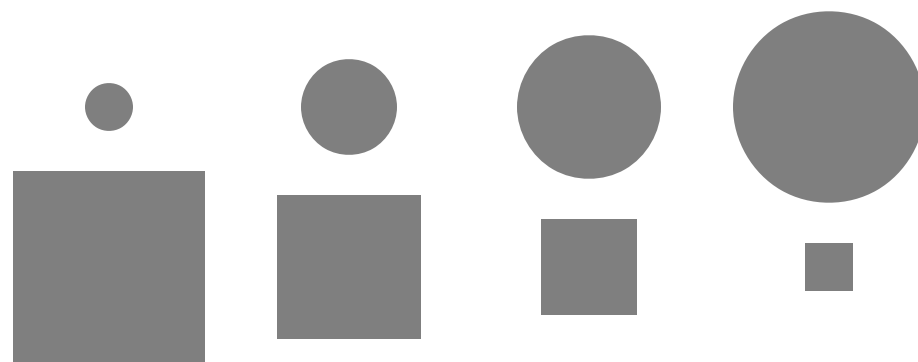


```
circle x y 2
circle x y 4
circle x y 8
square x y 8
square x y 4
square x y 2
```



grid "file" x y hspace vspace limit

```
circle x y 2
circle x y 4
circle x y 6
circle x y 8
square x y 8
square x y 6
square x y 4
square x y 2
```



grid "code/grid-ex.dsh" 35 33 10 10 65

Charts

description	keyword	arguments
Charts	dchart	options "file" (see next page)
Chart Legends	legend	"text" x y size font color

Chart Types

-bar	true	bar chart
-wbar	false	word bar chart
-hbar	false	horizontal bar chart
-donut	false	donut chart
-dot	false	dot chart
-lego	false	lego chart
-line	false	line chart
-pgrid	false	proportional grid
-pmap	false	proportional map
-bowtie	false	bowtie chart
-fan	false	fan chart
-radial	false	radial chart
-scatter	false	scatter chart
-slope	false	slope chart
-vol	false	volume (area) chart

Chart Elements

-csv	false	read CSV files
-frame	false	show a colored frame
-fulldeck	true	generate full deck markup
-grid	false	show gridlines on the y axis
-note	true	show annotations
-pct	false	show computed percentage
-rline	false	show a regression line
-solidpmap	false	show solid pmap colors
-spokes	false	show spokes in radial chart
-title	true	show the title
-val	true	show values
-xlast	false	show the last x label
-xstagger	false	stagger x axis labels
-yaxis	false	show a y axis
-chartitle	override title in data	specify the title
-datacond	low,high,color	conditional data colors
-hline	value,label	label horizontal line at value
-valpos	t=top, b=bottom, m=middle	value position
-xlabel	default=1, 0 to suppress	x axis label interval
-yrange	min,max.step	specify the y axis label range

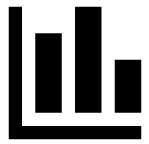
Position and Scaling

-top	80	top of the chart
-bottom	30	bottom of the chart
-left	20	left margin
-right	80	right margin
-min	data min	set the minimum data value
-max	data max	set the maximum data value

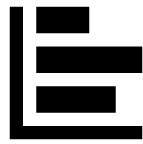
Measures and Attributes

-bgcolor	white	background color
-barwidth	computed from data size	barwidth
-color	lightsteelblue	data color
-csvcol	label1,label2	specify csv columns
-datafmt	%.1f	data format for values
-dmin	false	use data minimum, not zero
-framecolor	rgb(127,127,127)	frame color
-lcolor	rgb(75,75,75)	label color
-linewidth	0.2	linewidth
-ls	2.4	linespacing
-noteloc	c=center, r=right, l=left	annotation location
-pmlen	20	pmap label length
-psize	30	diameter of the donut
-pwidth	3	width of the donut or pmap
-rlcolor	rgb(127,0,0)	regression line color
-textsize	1.5	text size
-xlabrot	0	xlabel rotation (deg.)
-vcolor	rgb(127,0,0)	value color
-volop	50	volume opacity %

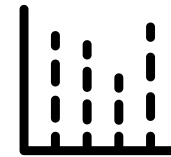
dchart types



Column



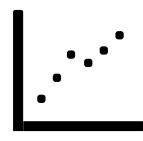
Bar



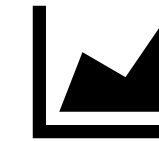
Dot



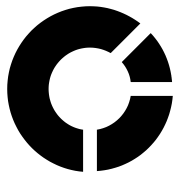
Line



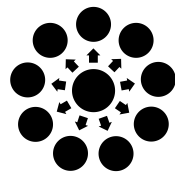
Scatter



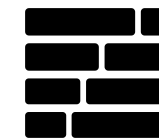
Area



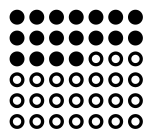
Donut/Pie



Radial



Pmap



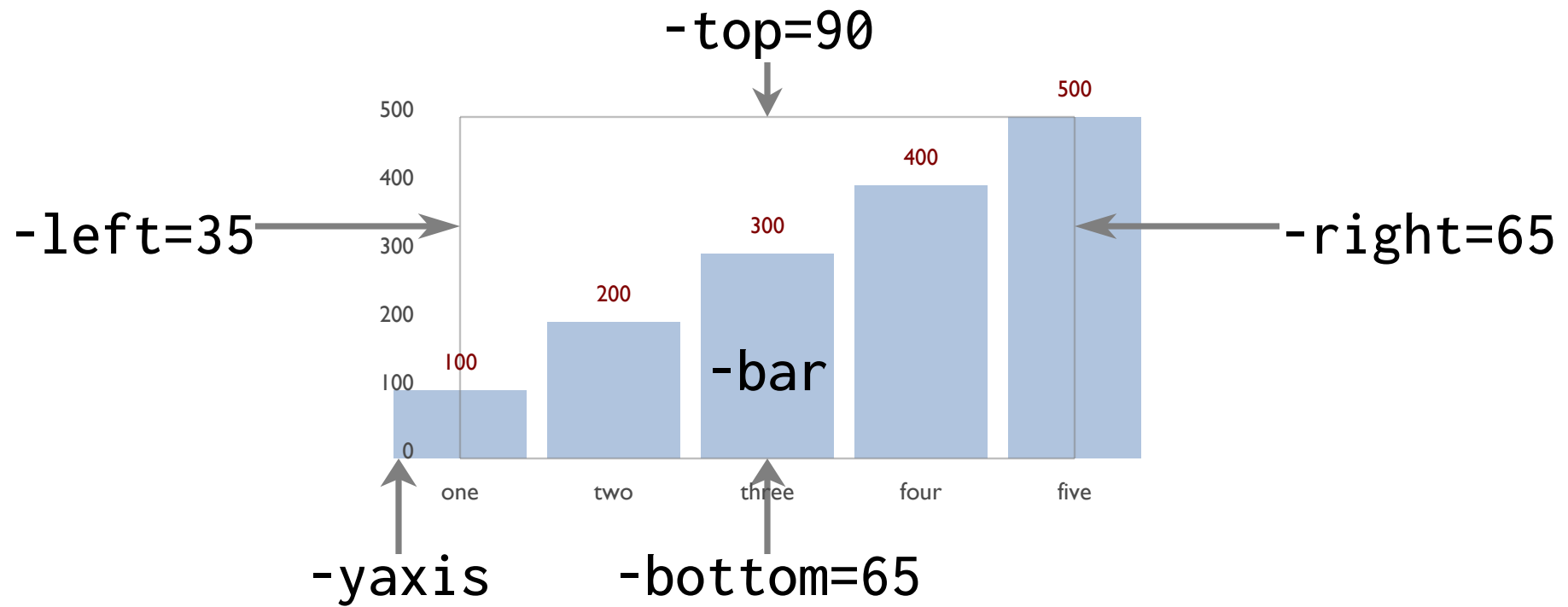
Waffle/Lego



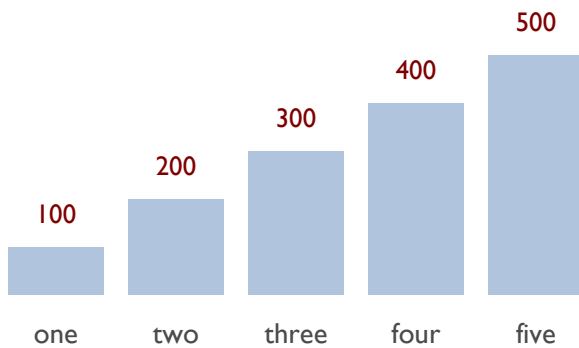
Fan



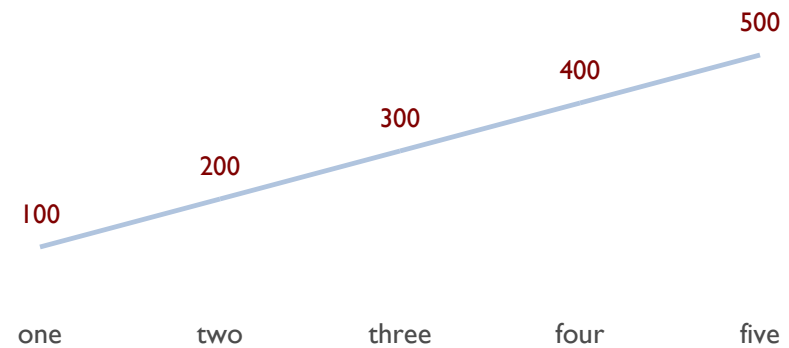
Bowtie



dchart options "file"



```
dchart -left=10 -right=30 -top=35 -bottom=20 "test.d"
```



```
dchart -left=55 -right=85 -top=35 -bottom=20 -bar=f -line "test.d"
```



■ My text
(x, y)

legend x y fontsize font color

■ Item on the chart

■ *Thing*

```
legend "Item on the chart" 20 30 3 "sans" "red"
```

```
legend "Thing" 70 30 2 "serif" "blue"
```