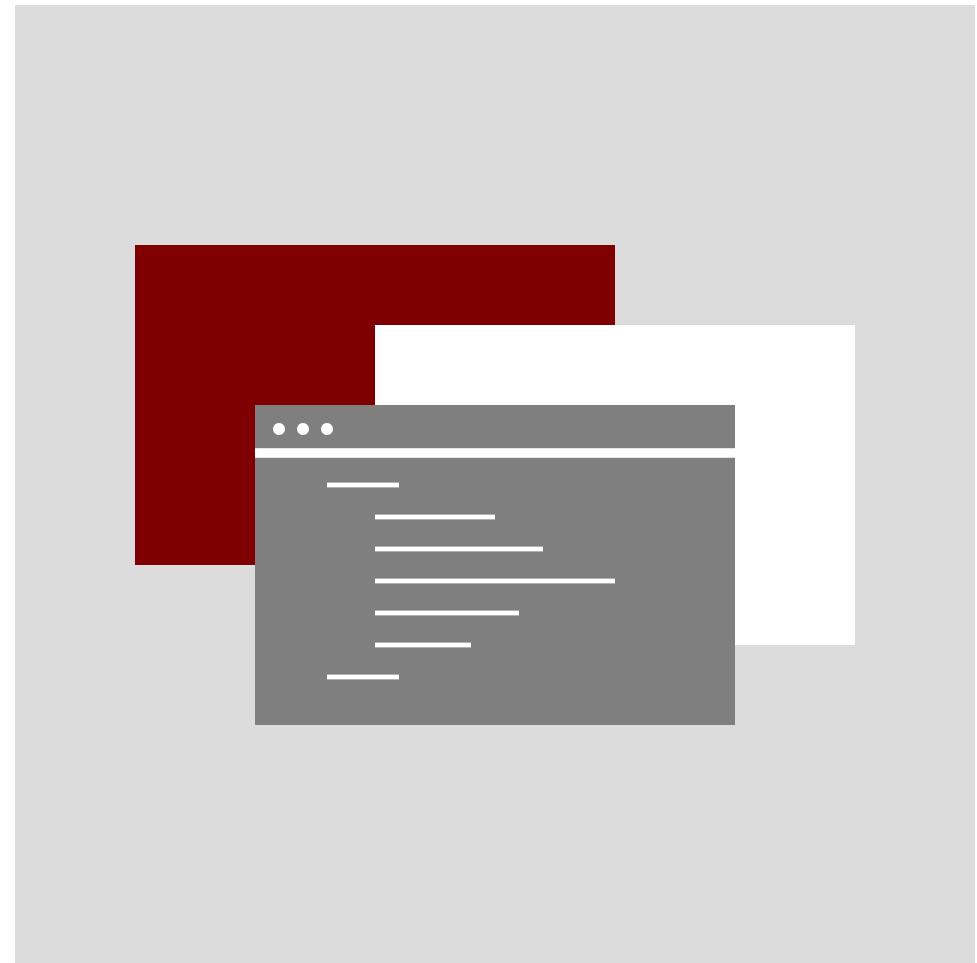


decksh reference



Version
2025-12-28-1.0.0

Introduction

decksh is a Domain-Specific Language (DSL) for making presentations, visualizations, and information displays.

This reference describes the keywords and elements of the language, how to structure decksh code, along with how to use variables, assignments, and binary operations.

Also included is a color reference and a detailed description, with examples, for all decksh elements.

Keywords

Structure Text

deck/edeck text
slide/eslide btext
canvas ctext
def/edef etext
for/efor rtext
func arctext
grid textblock
import textblockfile
include textfile
if/else/eif textcode

Graphics

acircle polygon
arc polyline
circle rect
curve rrect
ellipse ruler
hline square
line star
pill vline

Lists

list
blist
nlist
clist
li
elist

Braces Arrows

lbrace arrow
rbrace rarrow
ubrace larrow
dbrace uarrow
lbracket darrow
rbracket darrow
dbracket ubracket
ubracket

Maps

geoarc
geoborder
geoimage
geolabel
geoloc
geomark
geopath
geopathfile
georegion

Images

image
cimage

Charts

dchart donut
legend pie
area pmap
barchart pgrid
hbar logo
wbar
linechart
scatter

Assign

polar
polarx
polary
random
area
format
substr
vmap
dump

Math

cosine
sine
sqrt
tangent

Data

data
edata
content

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

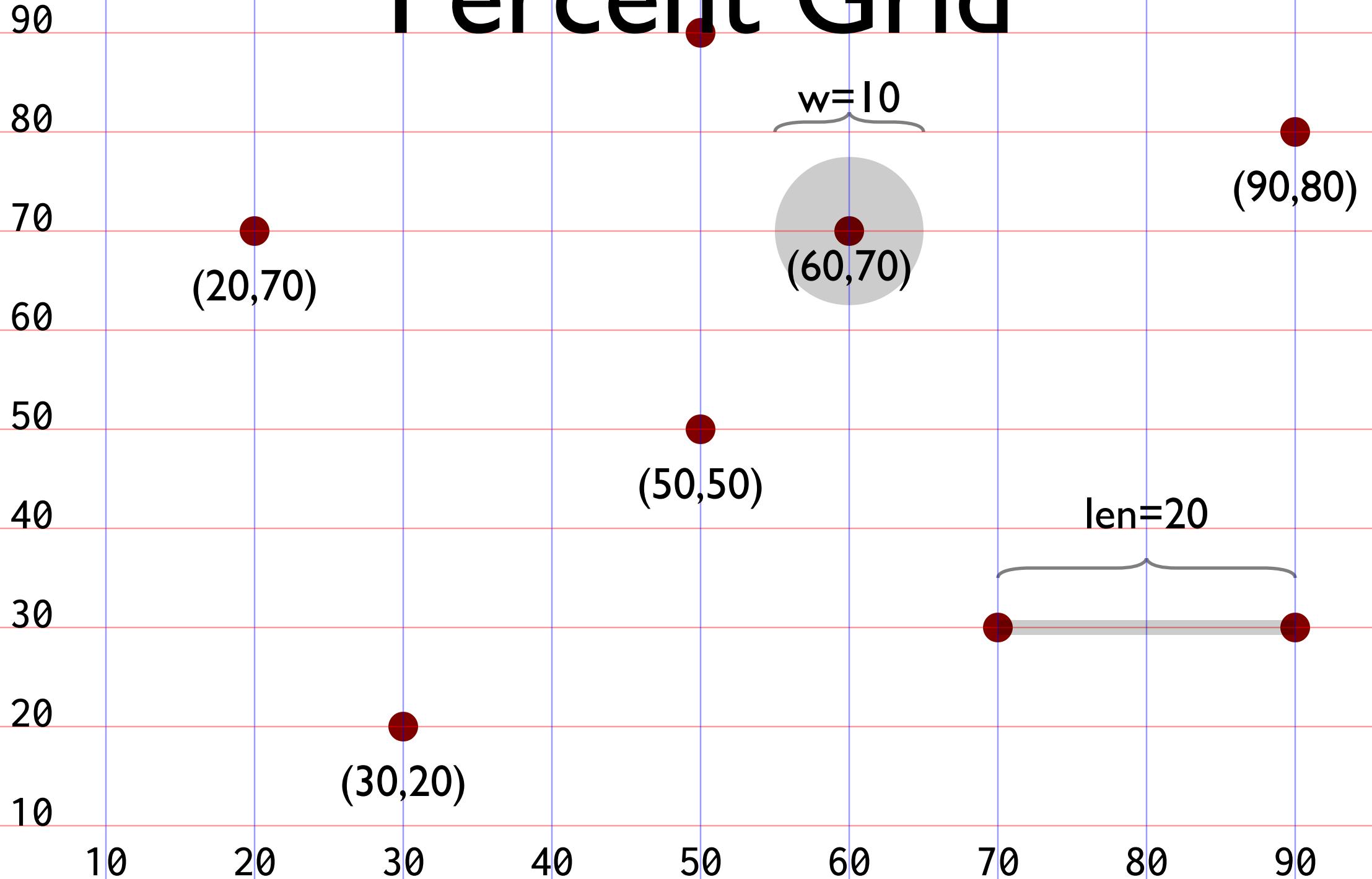
"serif" "red" 50

hello, world

Structure

```
// This is a comment           ← comment
deck
    canvas 1920 1080          ← canvas size hint (width height)
    variables {                ←
        x=20      // define x ← inline comment
        y=80
    }
    slide {                    ←
        slide 1 {                ←
            text "first" x y 2
            eslides
        }
        slide 2 {                ←
            slide "black" "white"
            include "file.dsh" {←
                ctext "hello, world" 50 25 10
                circle 50 0 100 "blue"
                for x=20 80 10
                    circle x 75 2
                efor
            }
            eslides
        }
    }
edek
```

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 | variable use |
| dump | [var | list] | dump the value of variables |

Binary operators

| | |
|------------------------|----------------|
| <code>x = a + b</code> | addition |
| <code>x = a - b</code> | subtraction |
| <code>x = a * b</code> | multiplication |
| <code>x = a / b</code> | division |
| <code>x = a % b</code> | modulo |

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

Special Assignments

| | |
|---------------------------|---------------------------------|
| p=(expr, expr) | coordinates (p_x, p_y) |
| p=polar cx cy r theta | polar coordinate (p_x, p_y) |
| x=polarx cx cy r theta | polar coordinate (x) |
| y=polary cx cy r theta | polar coordinate (y) |
| v=format string expr | number formatting |
| v=substr string begin end | substring |
| v=random v1 v2 | random number |
| v=vmap data v1 v2 v3 v4 | range map |
| v=area expr | area |
| v=cosine expr | cosine |
| v=sine expr | sine |
| v=sqrt expr | square root |
| v=tangent expr | tangent |

Colors, fonts, opacity, gradient

| Colors | Fonts | | | Opacity (0-100) |
|-------------------|----------|------------|-----|-----------------|
| "steelblue" | "sans" | Sans Serif | 100 | |
| "#4682b4" | "serif" | Serif | 50 | |
| "rgb(70,130,180)" | "mono" | Monospace | 25 | |
| "hsv(207,61,71)" | "symbol" | ✿❀❀✿❀✿ | 10 | |

"red/blue/90"

(applies to rect and square only)

Color Index

| name | hex | RGB | name | hex | RGB |
|----------------|---------|------------------|----------------|---------|------------------|
| aliceblue | #f0f8ff | rgb(240,248,255) | coral | #ff7f50 | rgb(255,127,80) |
| antiquewhite | #faebd7 | rgb(250,235,215) | cornflowerblue | #6495ed | rgb(100,149,237) |
| aqua | #00ffff | rgb(0,255,255) | cornsilk | #fff8dc | rgb(255,248,220) |
| aquamarine | #7fffad | rgb(127,255,212) | crimson | #dc143c | rgb(220,20,60) |
| azure | #f0ffff | rgb(240,255,255) | cyan | #00ffff | rgb(0,255,255) |
| beige | #f5f5dc | rgb(245,245,220) | darkblue | #00008b | rgb(0,0,139) |
| bisque | #ffe4c4 | rgb(255,228,196) | darkcyan | #008b8b | rgb(0,139,139) |
| black | #000000 | rgb(0,0,0) | darkgoldenrod | #b8860b | rgb(184,134,11) |
| blanchedalmond | #ffebcd | rgb(255,235,205) | darkgray | #a9a9a9 | rgb(169,169,169) |
| blue | #0000ff | rgb(0,0,255) | darkgreen | #006400 | rgb(0,100,0) |
| blueviolet | #8a2be2 | rgb(138,43,226) | darkgrey | #a9a9a9 | rgb(169,169,169) |
| brown | #a52a2a | rgb(165,42,42) | darkkhaki | #bdb76b | rgb(189,183,107) |
| burlywood | #deb887 | rgb(222,184,135) | darkmagenta | #8b008b | rgb(139,0,139) |
| cadetblue | #5f9ea0 | rgb(95,158,160) | darkolivegreen | #556b2f | rgb(85,107,47) |
| chartreuse | #7fff00 | rgb(127,255,0) | darkorange | #ff8c00 | rgb(255,140,0) |
| chocolate | #d2691e | rgb(210,105,30) | darkorchid | #9932cc | rgb(153,50,204) |

Color Index (2)

| name | hex | RGB | name | hex | RGB |
|---------------|---------|------------------|-------------|---------|------------------|
| darkred | #8b0000 | rgb(139,0,0) | fuchsia | #ff00ff | rgb(255,0,255) |
| darksalmon | #e9967a | rgb(233,150,122) | gainsboro | #dcdcdc | rgb(220,220,220) |
| darkseagreen | #8fbcbf | rgb(143,188,143) | ghostwhite | #f8f8ff | rgb(248,248,255) |
| darkslateblue | #483d8b | rgb(72,61,139) | gold | #ffd700 | rgb(255,215,0) |
| darkslategray | #2f4f4f | rgb(47,79,79) | goldenrod | #daa520 | rgb(218,165,32) |
| darkslategrey | #2f4f4f | rgb(47,79,79) | gray | #808080 | rgb(128,128,128) |
| darkturquoise | #00ced1 | rgb(0,206,209) | green | #008000 | rgb(0,128,0) |
| darkviolet | #9400d3 | rgb(148,0,211) | greenyellow | #adff2f | rgb(173,255,47) |
| deeppink | #ff1493 | rgb(255,20,147) | grey | #808080 | rgb(128,128,128) |
| deepskyblue | #00bfff | rgb(0,191,255) | honeydew | #f0ffff | rgb(240,255,240) |
| dimgray | #696969 | rgb(105,105,105) | hotpink | #ff69b4 | rgb(255,105,180) |
| dimgrey | #696969 | rgb(105,105,105) | indianred | #cd5c5c | rgb(205,92,92) |
| dodgerblue | #1e90ff | rgb(30,144,255) | indigo | #4b0082 | rgb(75,0,130) |
| firebrick | #b22222 | rgb(178,34,34) | ivory | #fffff0 | rgb(255,255,240) |
| floralwhite | #ffffaf | rgb(255,250,240) | khaki | #f0e68c | rgb(240,230,140) |
| forestgreen | #228b22 | rgb(34,139,34) | lavender | #e6e6fa | rgb(230,230,250) |

Color Index (3)

| name | hex | RGB | name | hex | RGB |
|----------------------|----------|--------------------|-------------------|---------|--------------------|
| lavenderblush | #fff0f5 | rgb(255, 240, 245) | lightsteelblue | #b0c4de | rgb(176, 196, 222) |
| lawngreen | #7cfcc0 | rgb(124, 252, 0) | lightyellow | #ffffe0 | rgb(255, 255, 224) |
| lemonchiffon | #ffffacd | rgb(255, 250, 205) | lime | #00ff00 | rgb(0, 255, 0) |
| lightblue | #add8e6 | rgb(173, 216, 230) | limegreen | #32cd32 | rgb(50, 205, 50) |
| lightcoral | #f08080 | rgb(240, 128, 128) | linen | #faf0e6 | rgb(250, 240, 230) |
| lightcyan | #e0ffff | rgb(224, 255, 255) | magenta | #ff00ff | rgb(255, 0, 255) |
| lightgoldenrodyellow | #fafad2 | rgb(250, 250, 210) | maroon | #800000 | rgb(128, 0, 0) |
| lightgray | #d3d3d3 | rgb(211, 211, 211) | mediumaquamarine | #66cdaa | rgb(102, 205, 170) |
| lightgreen | #90ee90 | rgb(144, 238, 144) | mediumblue | #0000cd | rgb(0, 0, 205) |
| lightgrey | #d3d3d3 | rgb(211, 211, 211) | mediumorchid | #ba55d3 | rgb(186, 85, 211) |
| lightpink | #ffb6c1 | rgb(255, 182, 193) | mediumpurple | #9370db | rgb(147, 112, 219) |
| lightsalmon | #ffa07a | rgb(255, 160, 122) | mediumseagreen | #3cb371 | rgb(60, 179, 113) |
| lightseagreen | #20b2aa | rgb(32, 178, 170) | mediumslateblue | #7b68ee | rgb(123, 104, 238) |
| lightskyblue | #87cefa | rgb(135, 206, 250) | mediumspringgreen | #00fa9a | rgb(0, 250, 154) |
| lightslategray | #778899 | rgb(119, 136, 153) | mediumturquoise | #48d1cc | rgb(72, 209, 204) |
| lightslategrey | #778899 | rgb(119, 136, 153) | mediumvioletred | #c71585 | rgb(199, 21, 133) |

Color Index (4)

| name | hex | RGB | name | hex | RGB |
|---------------|---------|------------------|-------------|---------|------------------|
| midnightblue | #191970 | rgb(25,25,112) | papayawhip | #ffefd5 | rgb(255,239,213) |
| mintcream | #f5ffff | rgb(245,255,250) | peachpuff | #ffdab9 | rgb(255,218,185) |
| mistyrose | #ffe4e1 | rgb(255,228,225) | peru | #cd853f | rgb(205,133,63) |
| moccasin | #ffe4b5 | rgb(255,228,181) | pink | #ffc0cb | rgb(255,192,203) |
| navajowhite | #ffdead | rgb(255,222,173) | plum | #dda0dd | rgb(221,160,221) |
| navy | #000080 | rgb(0,0,128) | powderblue | #b0e0e6 | rgb(176,224,230) |
| oldlace | #fdf5e6 | rgb(253,245,230) | purple | #800080 | rgb(128,0,128) |
| olive | #808000 | rgb(128,128,0) | red | #ff0000 | rgb(255,0,0) |
| olivedrab | #6b8e23 | rgb(107,142,35) | rosybrown | #bc8f8f | rgb(188,143,143) |
| orange | #ffa500 | rgb(255,165,0) | royalblue | #4169e1 | rgb(65,105,225) |
| orangered | #ff4500 | rgb(255,69,0) | saddlebrown | #8b4513 | rgb(139,69,19) |
| orchid | #da70d6 | rgb(218,112,214) | salmon | #fa8072 | rgb(250,128,114) |
| palegoldenrod | #eee8aa | rgb(238,232,170) | sandybrown | #f4a460 | rgb(244,164,96) |
| palegreen | #98fb98 | rgb(152,251,152) | seagreen | #2e8b57 | rgb(46,139,87) |
| paleturquoise | #afeeee | rgb(175,238,238) | seashell | #fff5ee | rgb(255,245,238) |
| palevioletred | #db7093 | rgb(219,112,147) | sienna | #a0522d | rgb(160,82,45) |

Color Index (5)

| name | hex | RGB | name | hex | RGB |
|-------------|---------|------------------|-------------|---------|------------------|
| silver | #c0c0c0 | rgb(192,192,192) | whitesmoke | #f5f5f5 | rgb(245,245,245) |
| skyblue | #87ceeb | rgb(135,206,235) | yellow | #ffff00 | rgb(255,255,0) |
| slateblue | #6a5acd | rgb(106,90,205) | yellowgreen | #9acd32 | rgb(154,205,50) |
| 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) | | | |

Neutrals

| name | hex | RGB | name | hex | RGB |
|----------------|---------|--------------------|----------------|---------|--------------------|
| aliceblue | #f0f8ff | rgb(240, 248, 255) | dimgray | #696969 | rgb(105, 105, 105) |
| antiquewhite | #faebd7 | rgb(250, 235, 215) | dimgrey | #696969 | rgb(105, 105, 105) |
| azure | #f0ffff | rgb(240, 255, 255) | floralwhite | #fffaf0 | rgb(255, 250, 240) |
| beige | #f5f5dc | rgb(245, 245, 220) | gainsboro | #dcdcdc | rgb(220, 220, 220) |
| bisque | #ffe4c4 | rgb(255, 228, 196) | ghostwhite | #f8f8ff | rgb(248, 248, 255) |
| black | #000000 | rgb(0, 0, 0) | gray | #808080 | rgb(128, 128, 128) |
| blanchedalmond | #ffebcd | rgb(255, 235, 205) | grey | #808080 | rgb(128, 128, 128) |
| brown | #a52a2a | rgb(165, 42, 42) | honeydew | #f0fff0 | rgb(240, 255, 240) |
| burlywood | #deb887 | rgb(222, 184, 135) | ivory | #fffff0 | rgb(255, 255, 240) |
| chocolate | #d2691e | rgb(210, 105, 30) | lavender | #e6e6fa | rgb(230, 230, 250) |
| cornsilk | #fff8dc | rgb(255, 248, 220) | lavenderblush | #fff0f5 | rgb(255, 240, 245) |
| darkgray | #a9a9a9 | rgb(169, 169, 169) | lightgray | #d3d3d3 | rgb(211, 211, 211) |
| darkgrey | #a9a9a9 | rgb(169, 169, 169) | lightgrey | #d3d3d3 | rgb(211, 211, 211) |
| darksalmon | #e9967a | rgb(233, 150, 122) | lightslategray | #778899 | rgb(119, 136, 153) |
| darkslategray | #2f4f4f | rgb(47, 79, 79) | lightslategrey | #778899 | rgb(119, 136, 153) |
| darkslategrey | #2f4f4f | rgb(47, 79, 79) | linen | #faf0e6 | rgb(250, 240, 230) |

Neutrals (2)

| name | hex | RGB | name | hex | RGB |
|-------------|----------|--------------------|------------|---------|--------------------|
| mintcream | #f5ffff | rgb(245, 255, 250) | slategrey | #708090 | rgb(112, 128, 144) |
| mistyrose | #ffe4e1 | rgb(255, 228, 225) | snow | #fffafa | rgb(255, 250, 250) |
| moccasin | #ffe4b5 | rgb(255, 228, 181) | tan | #d2b48c | rgb(210, 180, 140) |
| navajowhite | #ffdead | rgb(255, 222, 173) | wheat | #f5deb3 | rgb(245, 222, 179) |
| oldlace | #fdf5e6 | rgb(253, 245, 230) | white | #ffffff | rgb(255, 255, 255) |
| papayawhip | #ffefdf | rgb(255, 239, 213) | whitesmoke | #f5f5f5 | rgb(245, 245, 245) |
| 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 | #ffff5ee | rgb(255, 245, 238) | | | |
| sienna | #a0522d | rgb(160, 82, 45) | | | |
| silver | #c0c0c0 | rgb(192, 192, 192) | | | |
| slategray | #708090 | rgb(112, 128, 144) | | | |

Reds

| name | hex | RGB | name | hex | RGB |
|-------------|---------|------------------|---------------|---------|------------------|
| coral | #ff7f50 | rgb(255,127,80) | palevioletred | #db7093 | rgb(219,112,147) |
| crimson | #dc143c | rgb(220,20,60) | pink | #ffc0cb | rgb(255,192,203) |
| darkmagenta | #8b008b | rgb(139,0,139) | plum | #dda0dd | rgb(221,160,221) |
| darkred | #8b0000 | rgb(139,0,0) | red | #ff0000 | rgb(255,0,0) |
| deeppink | #ff1493 | rgb(255,20,147) | thistle | #d8bfd8 | rgb(216,191,216) |
| firebrick | #b22222 | rgb(178,34,34) | tomato | #ff6347 | rgb(255,99,71) |
| 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) | | | |

Greens

| name | hex | RGB | name | hex | RGB |
|-------------------|----------|------------------|-------------|---------|------------------|
| aquamarine | #7ffffd4 | rgb(127,255,212) | olive | #808000 | rgb(128,128,0) |
| chartreuse | #7fff00 | rgb(127,255,0) | olivedrab | #6b8e23 | rgb(107,142,35) |
| darkgreen | #006400 | rgb(0,100,0) | palegreen | #98fb98 | rgb(152,251,152) |
| darkkhaki | #bdb76b | rgb(189,183,107) | seagreen | #2e8b57 | rgb(46,139,87) |
| darkolivegreen | #556b2f | rgb(85,107,47) | springgreen | #00ff7f | rgb(0,255,127) |
| darkseagreen | #8fbcb8 | rgb(143,188,143) | teal | #008080 | rgb(0,128,128) |
| forestgreen | #228b22 | rgb(34,139,34) | yellowgreen | #9acd32 | rgb(154,205,50) |
| green | #008000 | rgb(0,128,0) | | | |
| greenyellow | #adff2f | rgb(173,255,47) | | | |
| lawngreen | #7cfcc00 | 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) | | | |

Blues

| name | hex | RGB | name | hex | RGB |
|------------------|---------|--------------------|-----------------|---------|--------------------|
| aqua | #00ffff | rgb(0, 255, 255) | mediumblue | #0000cd | rgb(0, 0, 205) |
| blue | #0000ff | rgb(0, 0, 255) | mediumslateblue | #7b68ee | rgb(123, 104, 238) |
| cadetblue | #5f9ea0 | rgb(95, 158, 160) | mediumturquoise | #48d1cc | rgb(72, 209, 204) |
| cornflowerblue | #6495ed | rgb(100, 149, 237) | midnightblue | #191970 | rgb(25, 25, 112) |
| cyan | #00ffff | rgb(0, 255, 255) | navy | #000080 | rgb(0, 0, 128) |
| darkblue | #00008b | rgb(0, 0, 139) | paleturquoise | #afeeee | rgb(175, 238, 238) |
| darkcyan | #008b8b | rgb(0, 139, 139) | powderblue | #b0e0e6 | rgb(176, 224, 230) |
| darkslateblue | #483d8b | rgb(72, 61, 139) | royalblue | #4169e1 | rgb(65, 105, 225) |
| darkturquoise | #00ced1 | rgb(0, 206, 209) | skyblue | #87ceeb | rgb(135, 206, 235) |
| deepskyblue | #00bfff | rgb(0, 191, 255) | slateblue | #6a5acd | rgb(106, 90, 205) |
| dodgerblue | #1e90ff | rgb(30, 144, 255) | steelblue | #4682b4 | rgb(70, 130, 180) |
| lightblue | #add8e6 | rgb(173, 216, 230) | turquoise | #40e0d0 | rgb(64, 224, 208) |
| lightcyan | #e0ffff | rgb(224, 255, 255) | | | |
| lightskyblue | #87cefa | rgb(135, 206, 250) | | | |
| lightsteelblue | #b0c4de | rgb(176, 196, 222) | | | |
| mediumaquamarine | #66cdaa | rgb(102, 205, 170) | | | |

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 | #ffffacd | 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) |

(b)text ctext etext rtext arctext textbox textfile textcode line

begin center end

rotate

hello,
world

Now is the time
for all good men
to come

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

```
import "fmt"  
func main() {  
    fmt.Println("Go")  
}
```



hline vline arc curve polyline circle acircle ellipse square

rect rrect pill polygon star image cimage lbrace rbrace



ubrace dbrace lbracket rbracket ubracket dbracket sky arrow larrow rarrow



dcarrow uarrow list blist nlist clist

one
two
three

- one
- two
- three

1. one
2. two
3. three

first
second item
third

decksh version
2025-12-28-1.0.0

Textual Elements

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

```
rtext "..." x y angle fontsize font color op link
```

abc

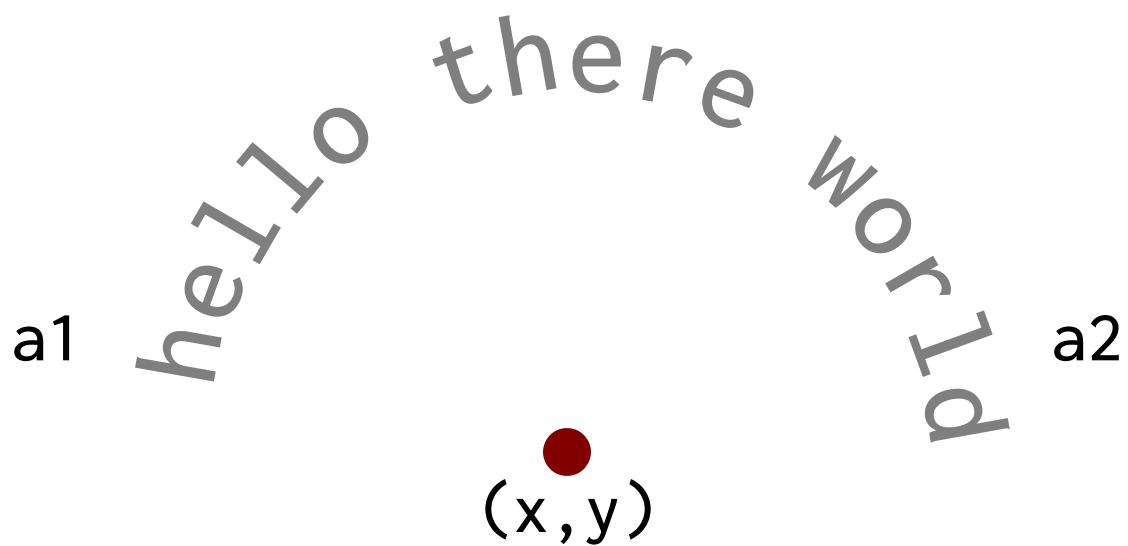
```
rtext 20 20 30 3
```

abc

```
rtext 50 20 90 5
```

abc

```
rtext 80 20 270 4 "sans" "maroon"
```



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

Two examples of curved text. On the left, the text "What is up" is written in a black monospace font, curving upwards from left to right. On the right, the text "This is curvy" is written in a black monospace font, curving downwards from left to right.

```
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.”

w

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.”

“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

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

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

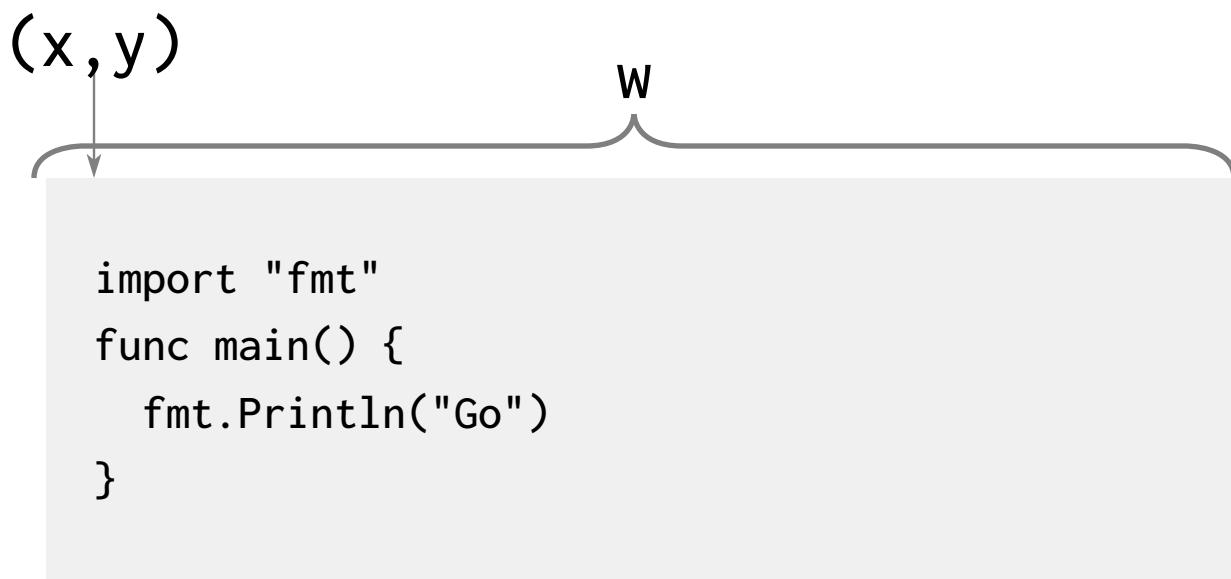
textfile "..." x y fontsize font color op link

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

```
import "fmt"
func main() {
    fmt.Println("Go")
}
```

textfile "example.txt" 10 35 2

textfile "hw-go" 55 35 1.6 "mono" "maroon"



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

```
import "fmt"
func main() {
    fmt.Println("Go")
}
```

```
import "fmt"
func main() {
    fmt.Println("Go")
}
```

textcode "hw-go" 10 35 25 1.0

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 |
| Polyline | polyline | "x1 x2...xn" "y1 y2...yn" | lw color op |
| N-sided star | star | x y sides inner outer | color op |

`lw {`

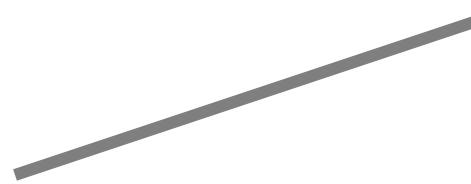
`(x1,y1)`



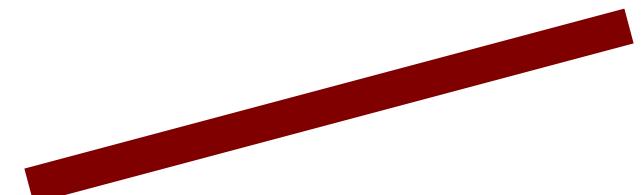
`(x2,y2)`

`line x1 y1 x2 y2 lw color op`

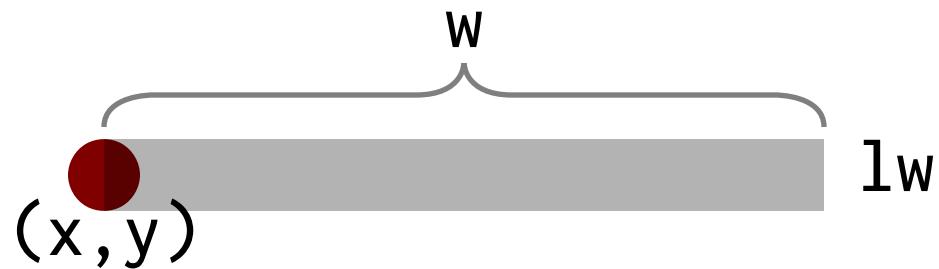
`line 10 20 30 20`



`line 40 20 60 30 0.5`



`line 70 20 95 30 1.5 "maroon"`



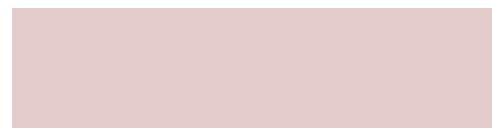
hline x y w lw color op

—

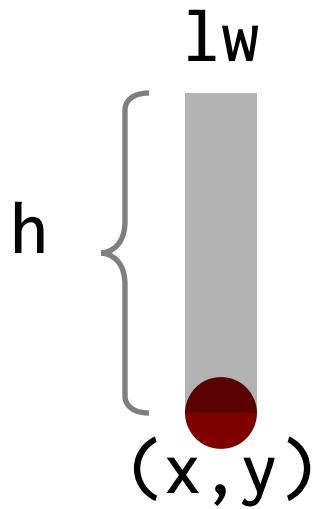
hline 15 20 10

—

hline 40 20 20 1



hline 70 20 20 5 "maroon" 20



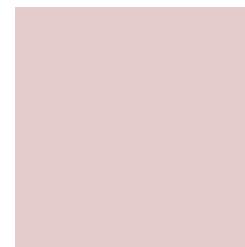
vline x y w lw color op



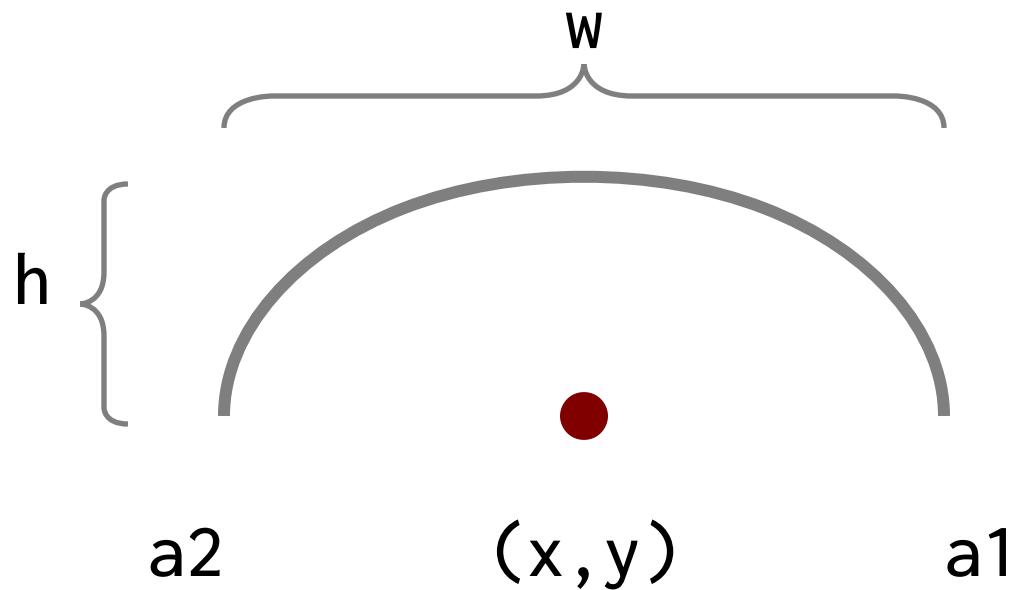
vline 20 20 15



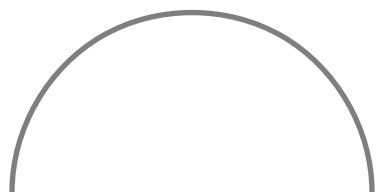
vline 50 20 15 2



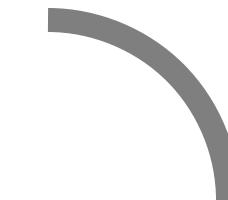
vline 80 20 15 10 "maroon" 20



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



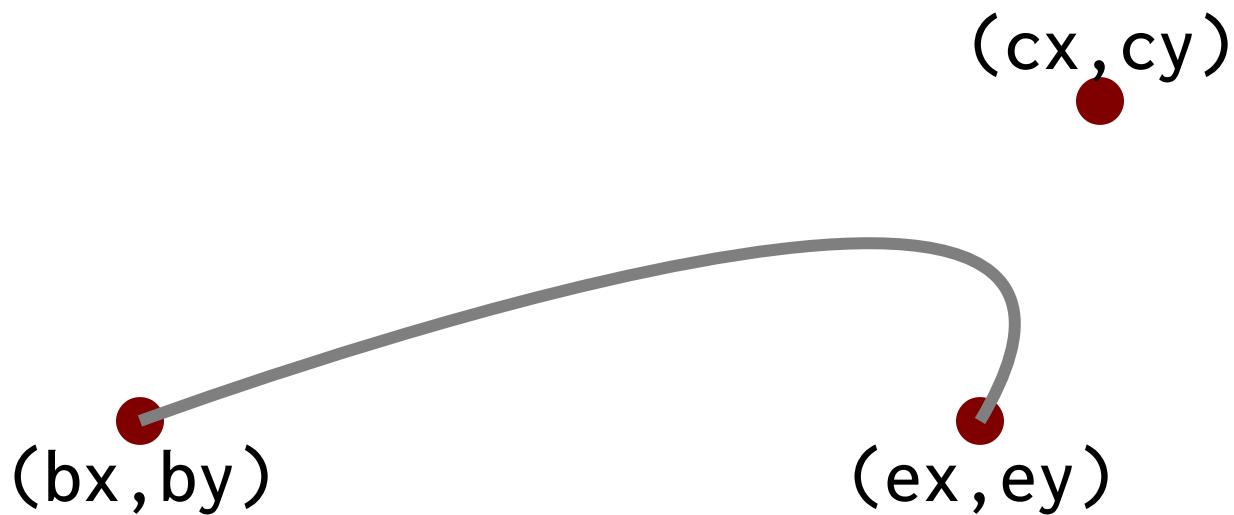
arc 20 20 15 15 0 180



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



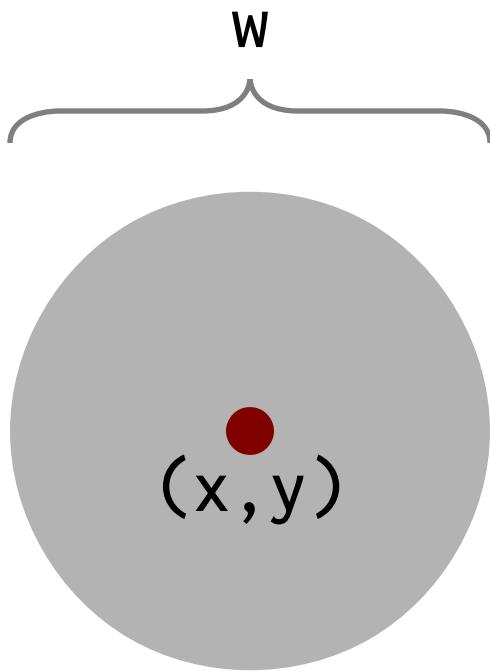
curve 15 20 25 30 25



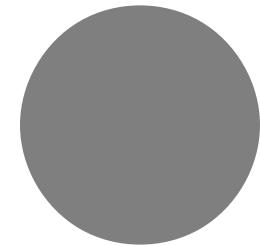
curve 15 20 25 30 25



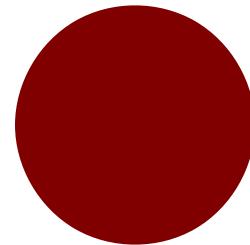
curve 70 20 70 30 90 25 0.5 "maroon"



circle x y w color op



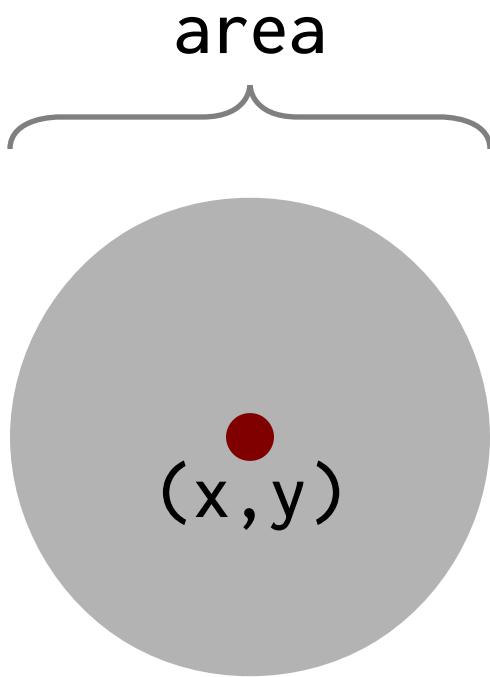
circle 20 20 10



circle 50 20 10 "maroon"



circle 80 20 5 "maroon" 20



circle x y area color op



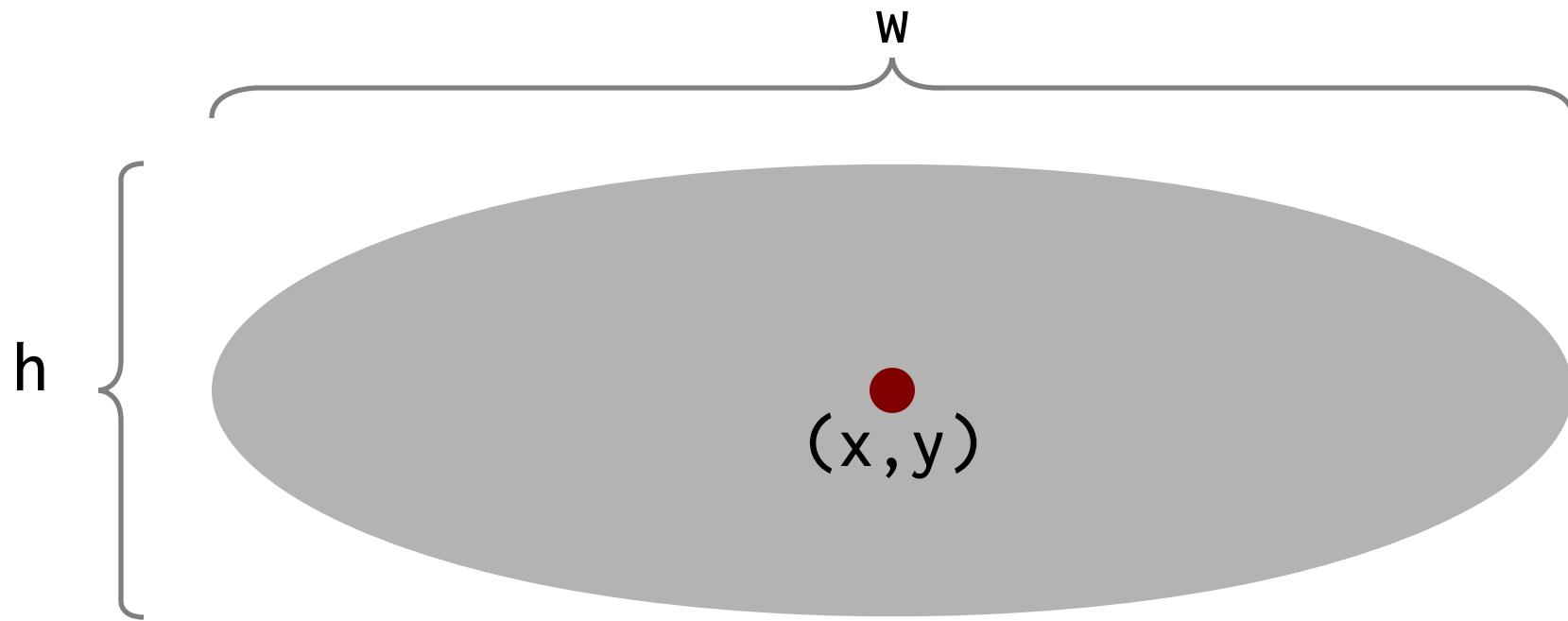
acircle 20 20 10



acircle 50 20 10 "maroon"



acircle 80 20 5 "maroon" 20



ellipse x y w h color op



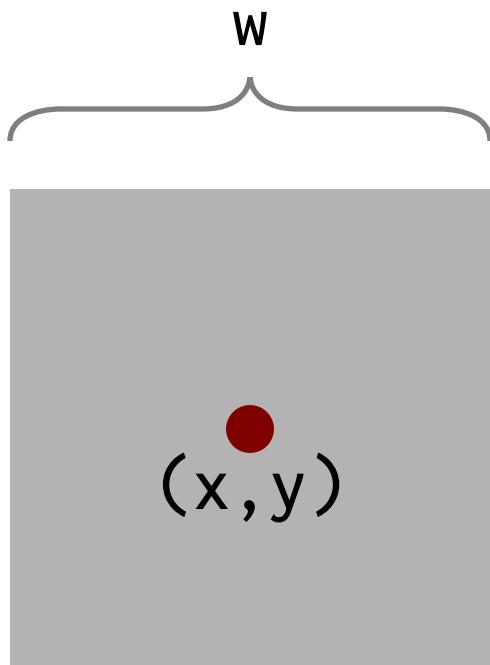
ellipse 20 20 10 5



ellipse 50 20 10 5 "maroon"



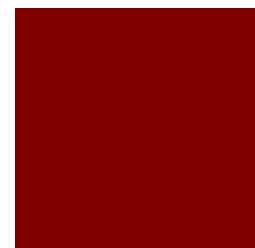
ellipse 80 20 5 10 "maroon" 20



square x y w color op



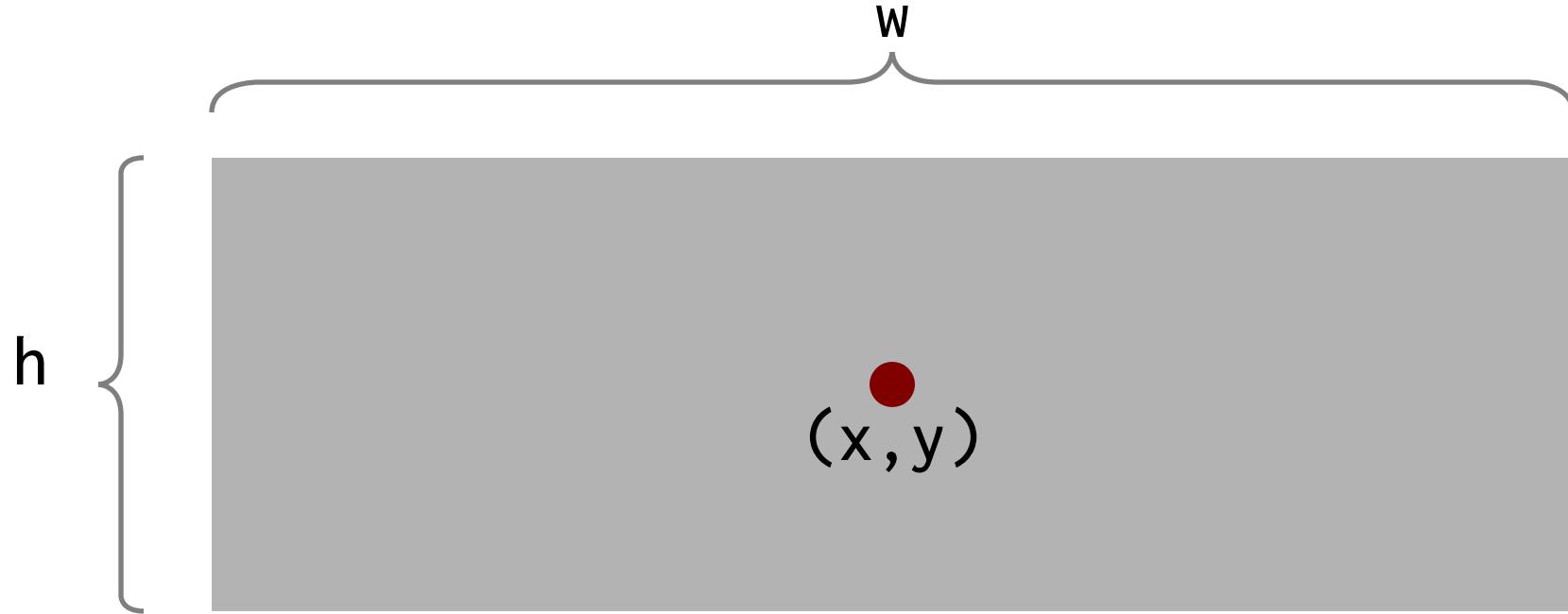
square 20 20 10



square 50 20 10 "maroon"



square 80 20 5 "maroon" 20



rect x y w h color op



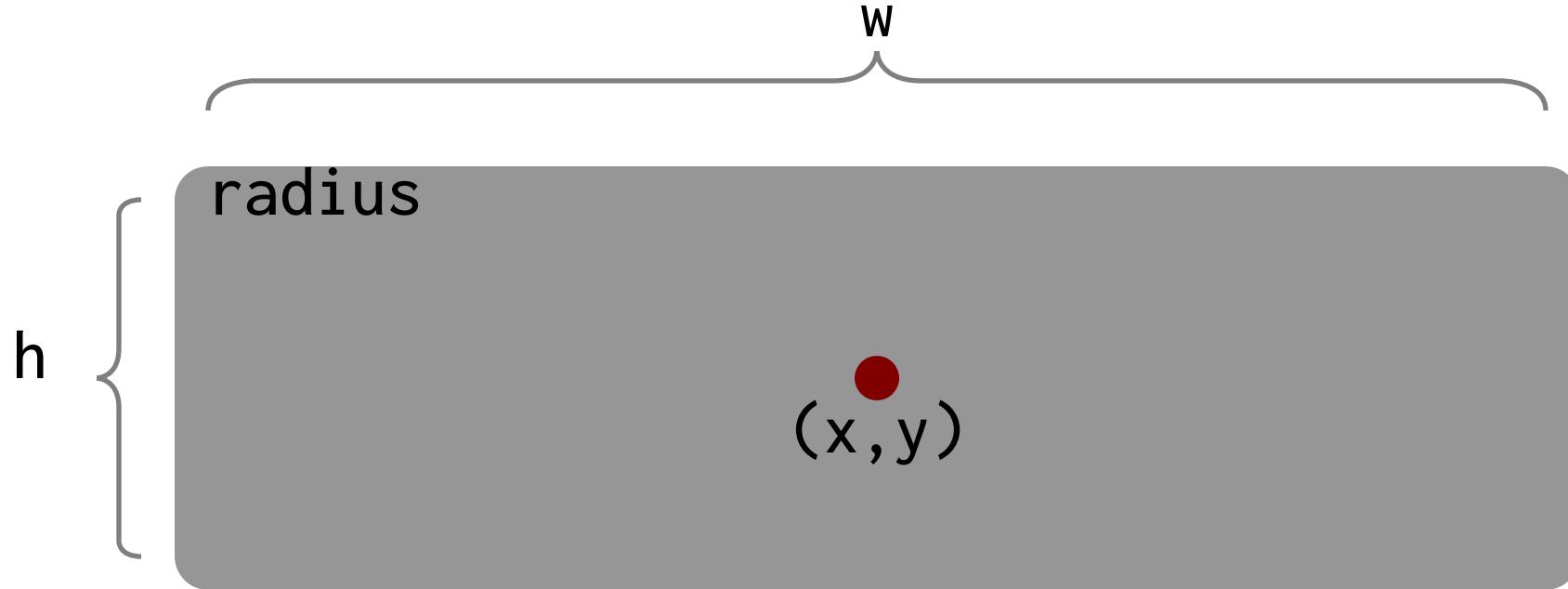
rect 20 20 10 5



rect 50 20 10 5 "maroon"



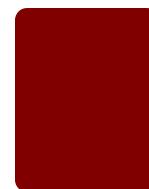
rect 80 20 5 10 "maroon" 20



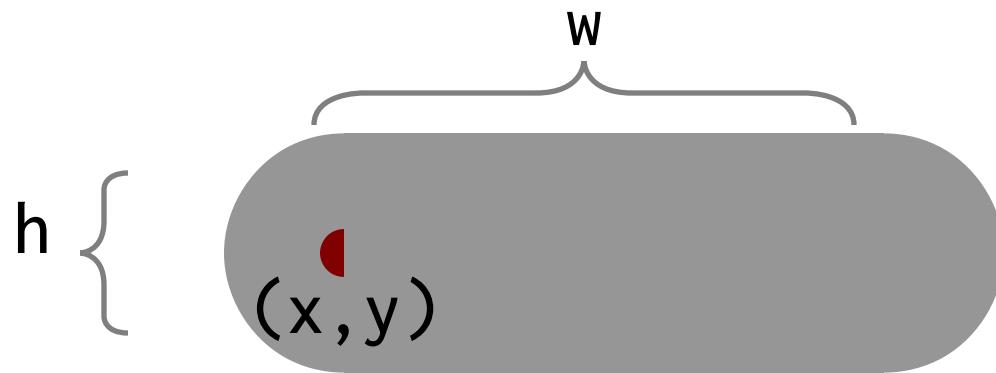
rrect x y w h radius color op



rrect 20 20 10 5 1



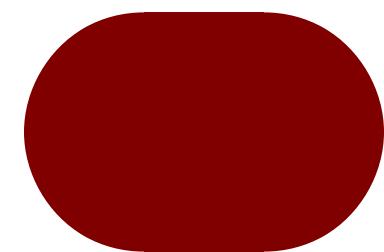
rrect 80 20 5 10 1 "maroon"



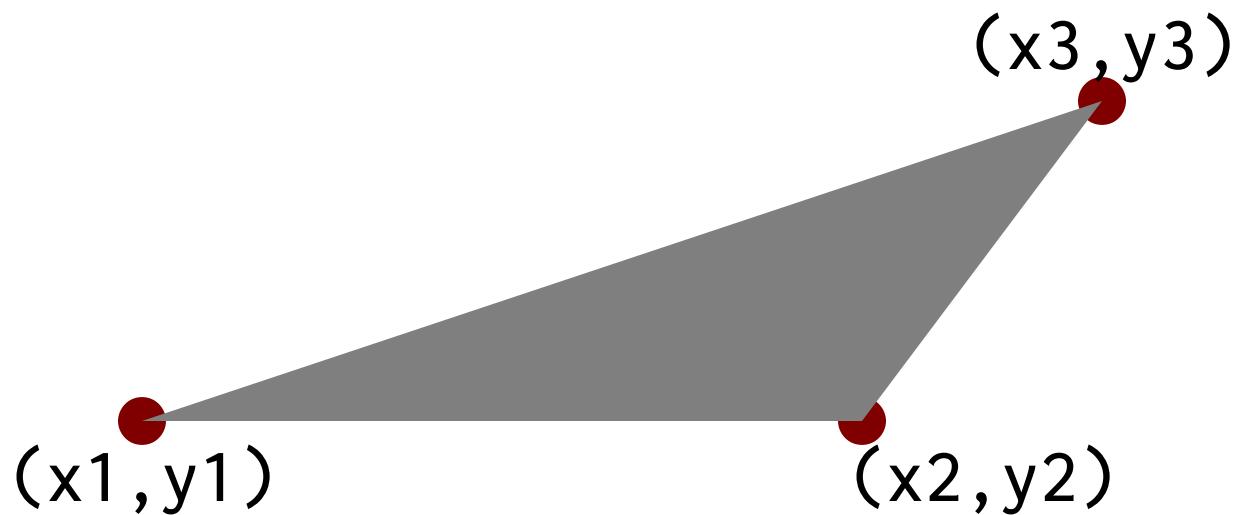
pill x y w h color



pill 20 20 10 5



pill 80 20 5 10 "maroon"



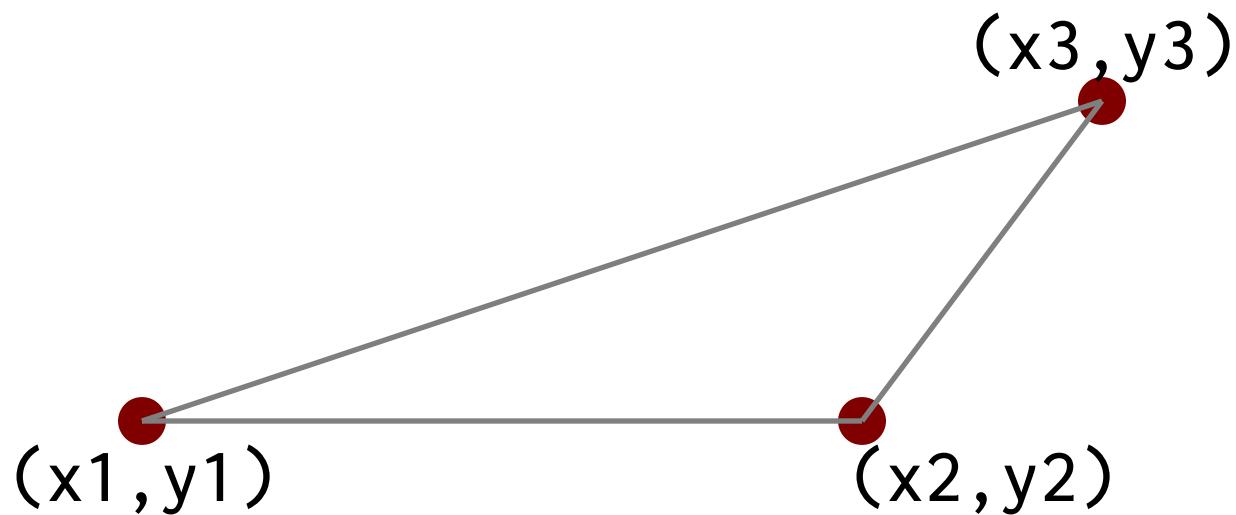
```
polygon "x1 x2...xn" "y1 y2...yn" color op
```



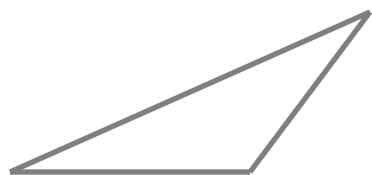
```
polygon "10 25 20" "20 30 20"
```



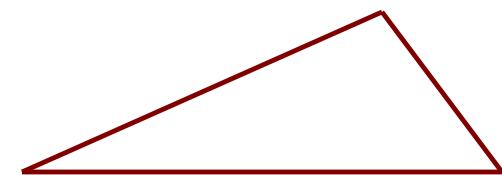
```
polygon "70 85 90" "20 30 20" "maroon"
```



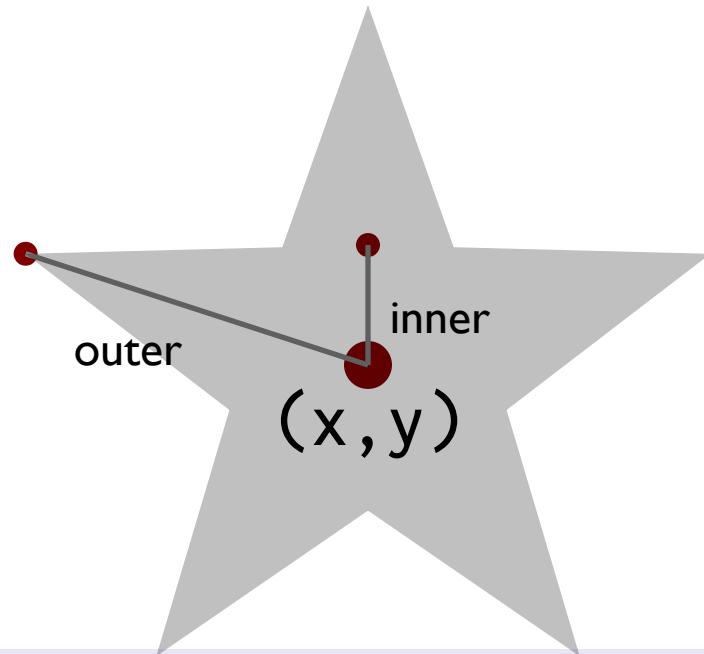
```
polyline "x1 x2...xn" "y1 y2...yn" lw color op
```



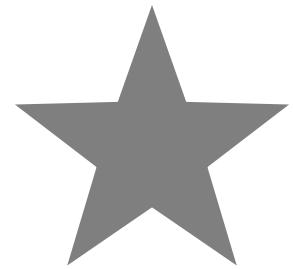
```
polyline "10 25 20" "20 30 20"
```



```
polyline "70 85 90" "20 30 20" 0.2 "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 | image | "file" x y w h | scale "link" |
| Captioned image | cimage | "file" "caption" x y w h | scale "link" capsiz |

If h = 0, w specifies the image width in terms of canvas width.

The scale value is a percentage from 1-100, and link is a URL. capsiz is the text size of the caption

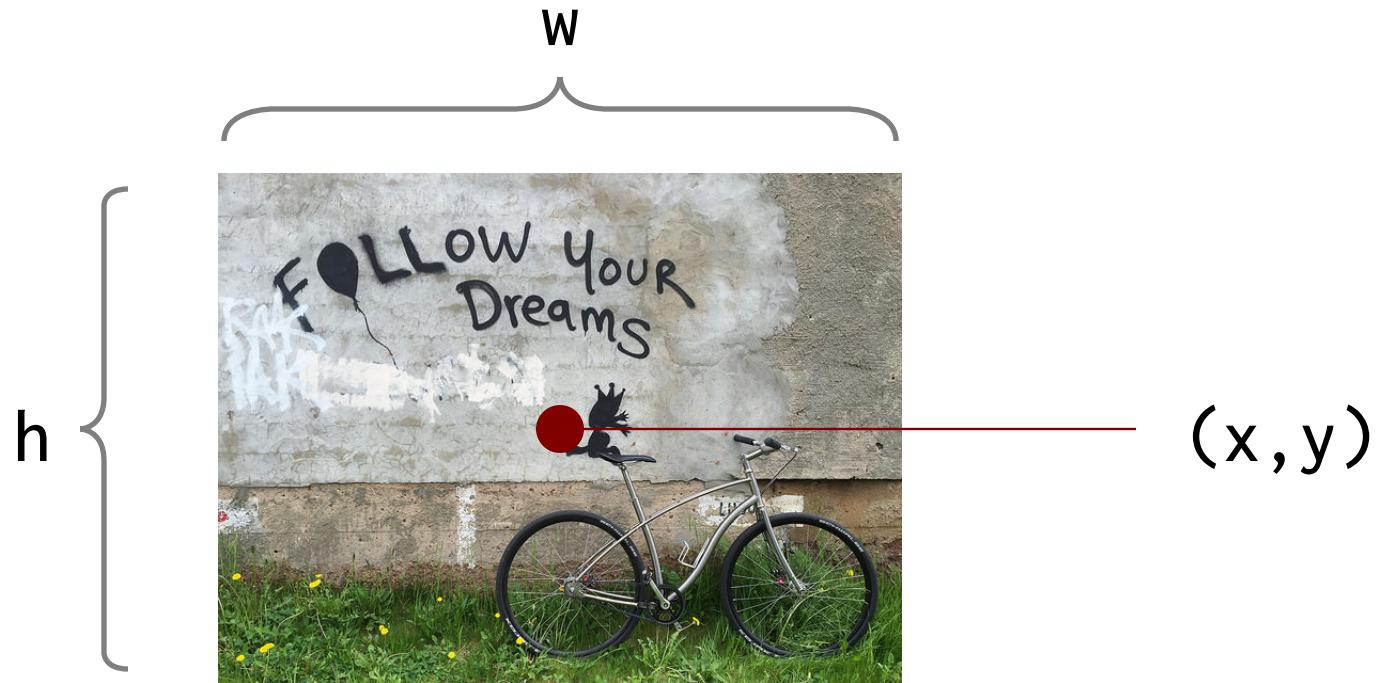


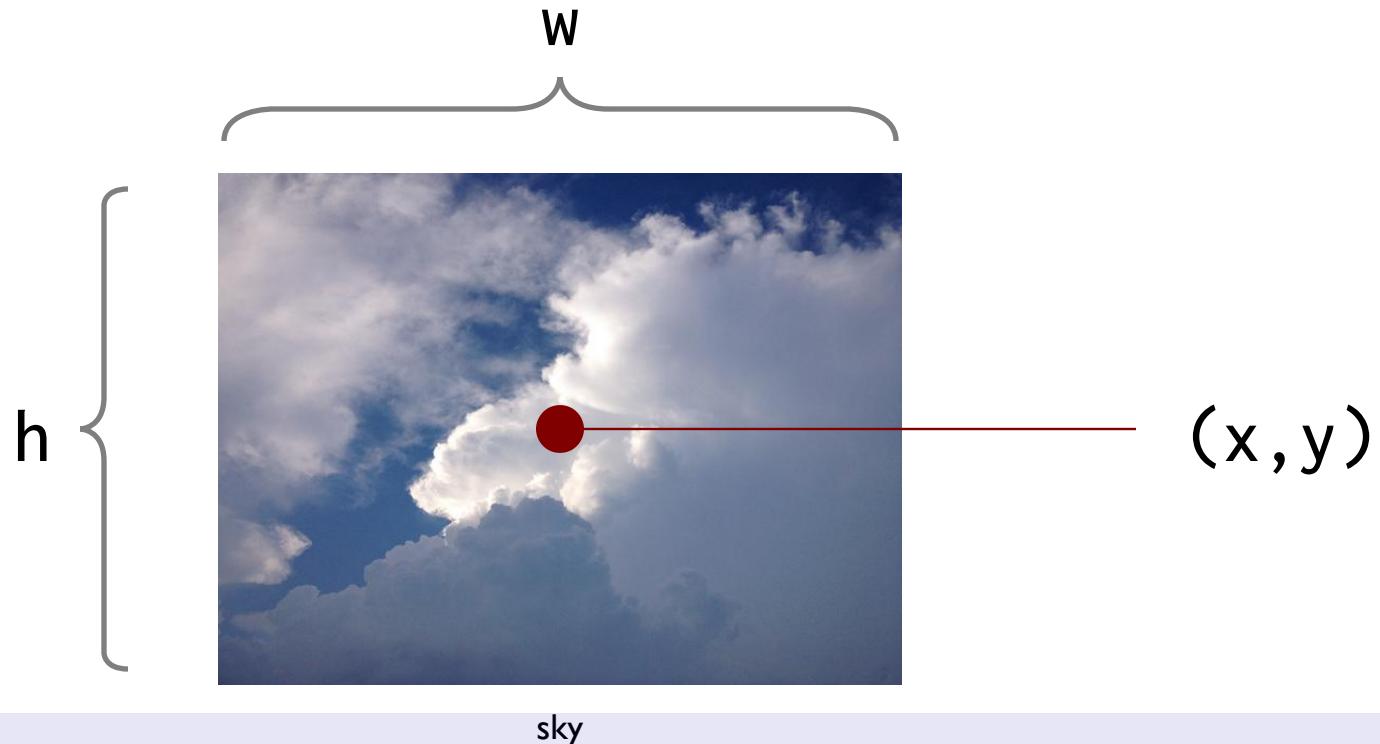
image "file" x y w h scale link



image "follow.jpg" 20 25 640 480 10



image "follow.jpg" 75 25 640 480 30



cimage "file" 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 | list | x y fontsize | font color op spacing |
| Bullet list | blist | x y fontsize | font color op spacing |
| Numbered list | nlist | x y fontsize | font color op spacing |
| Centered list | clist | x y fontsize | font color op spacing |

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 2.5 "serif" "maroon" 100 1.0 one
li "one"
li "two"
li "three" three
elist

```
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"  
elist           ● three
```

```
blist 85 30 2.5 "serif" "maroon" 100 1.0 ● one  
      li "one"  
      li "two"  
      li "three"  
elist           ● 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 1. one  
      li "one"  
      li "two"   2. two  
      li "three"  
elist           3. three
```

```
nlist 85 30 2.5 "serif" "maroon" 100 1.0 1. one  
      li "one"  
      li "two"   2. two  
      li "three"  
elist           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 | first one | clist 90 30 2.5 "serif" "maroon" 100 1.0 | first |
| li "first one" | | li "first" | next |
| li "next" | next | li "next" | and last |
| li "and last" | and last | li "and last" | |
| elist | | elist | |

Arrows

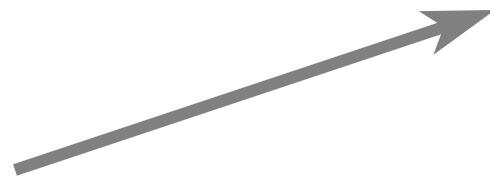
| description | keyword | mandatory | optional |
|--------------|---------|-------------------|-------------------|
| Straight | arrow | x1 y1 x2 y2 | lw aw ah color op |
| Left curved | larrow | bx by cx cy ex ey | lw aw ah color op |
| Right curved | rcarrow | bx by cx cy ex ey | lw aw ah color op |
| Up curved | ucarrow | bx by cx cy ex ey | lw aw ah color op |
| Down curved | darrow | bx by cx cy ex ey | lw aw ah color op |



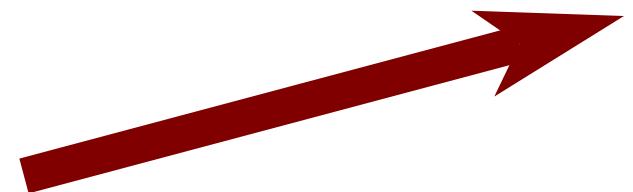
arrow x1 y1 x2 y2 lw aw ah color op



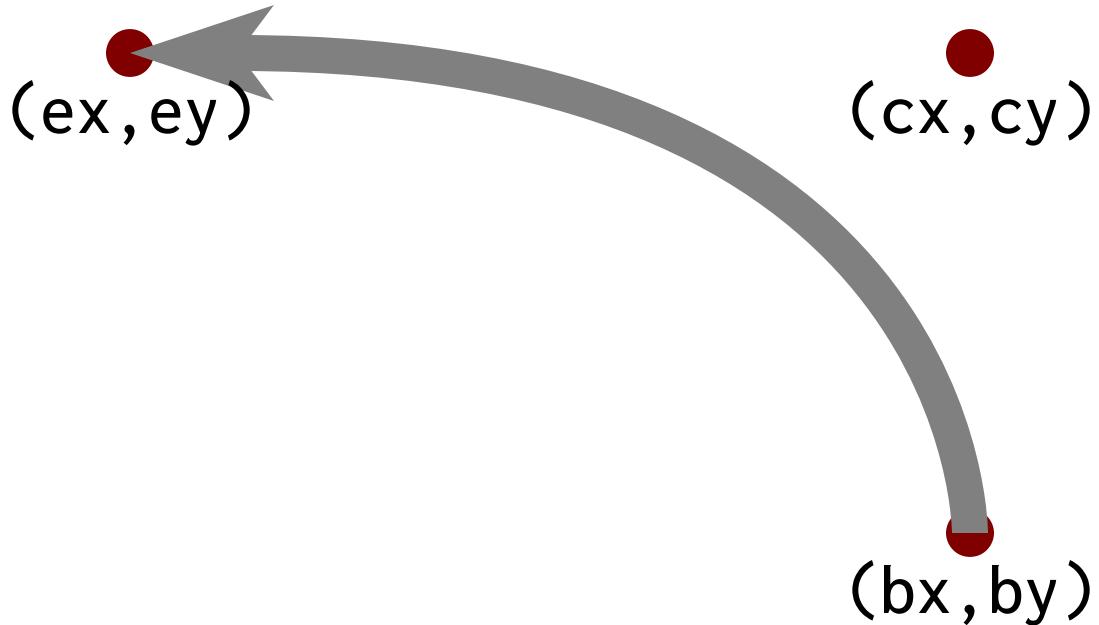
arrow 10 20 30 20



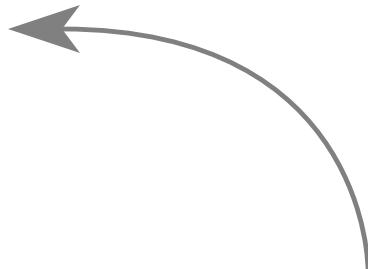
arrow 40 20 60 30 0.5



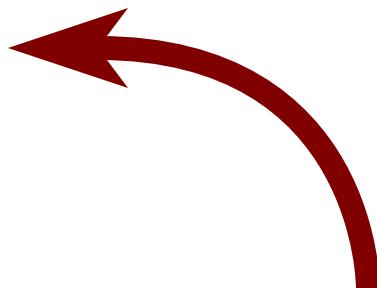
arrow 70 20 95 30 1.5 6 6 "maroon"



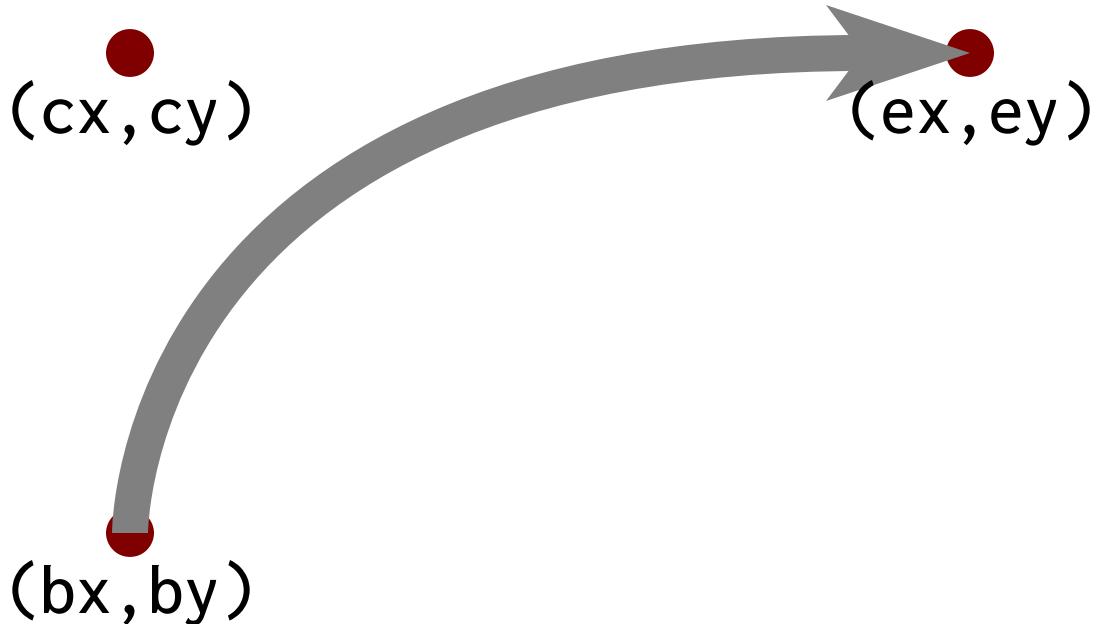
larrow bx by cx cy ex ey lw aw ah color op



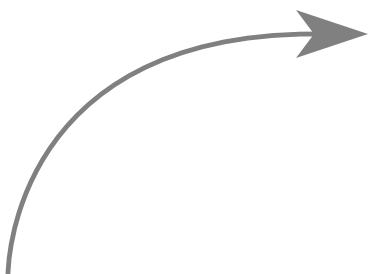
larrow 30 20 30 35 15 35



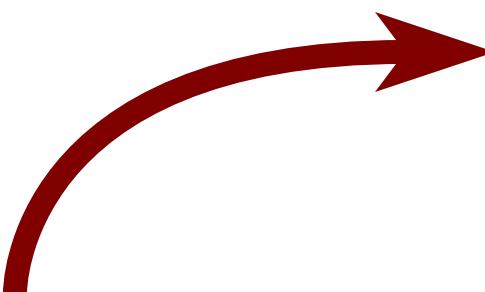
larrow 70 20 70 35 55 35 1 5 5 "maroon"



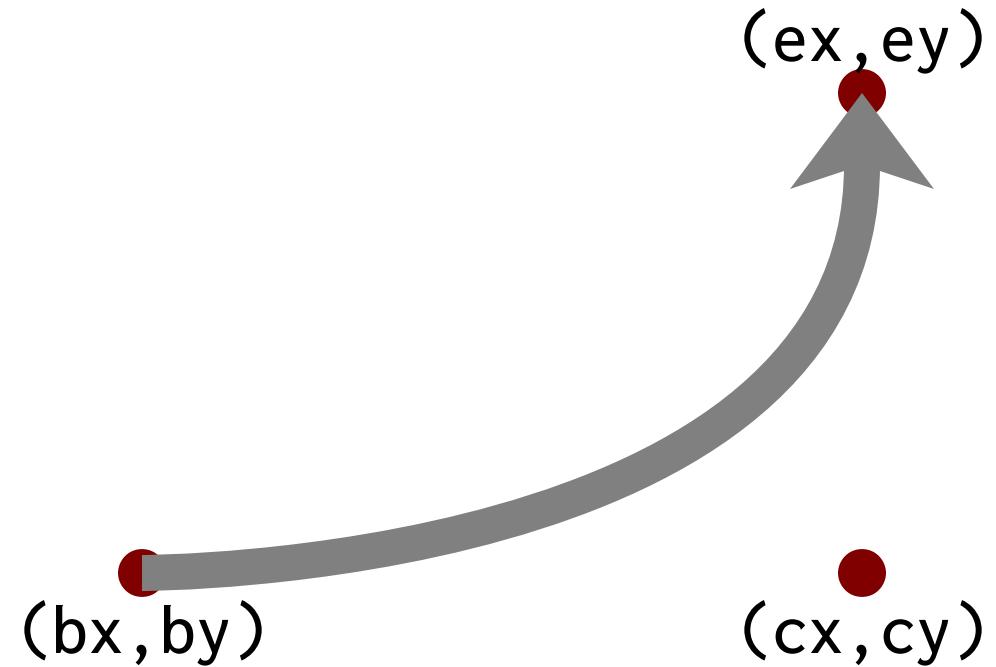
```
rcarrow bx by cx cy ex ey lw aw ah color op
```



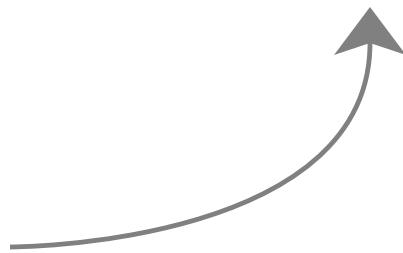
```
rcarrow 15 20 15 35 30 35
```



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



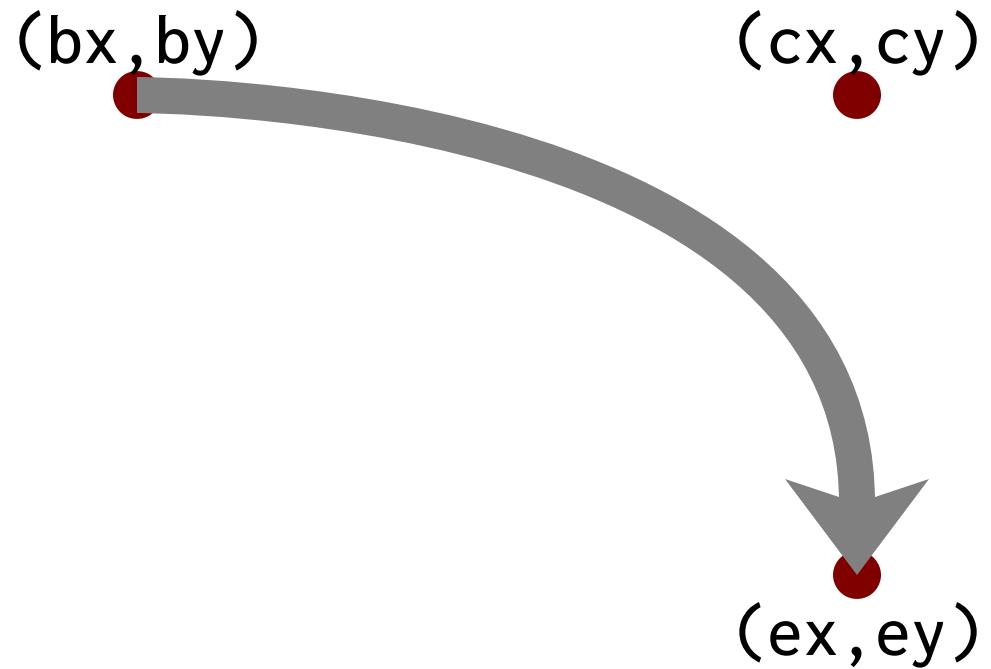
ucarrow bx by cx cy ex ey lw aw ah color op



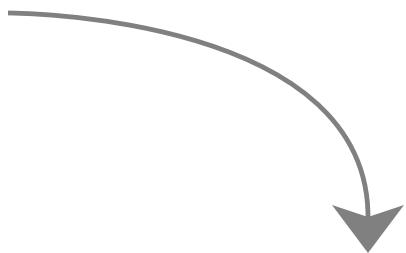
ucarrow 15 20 30 20 30 35



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



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



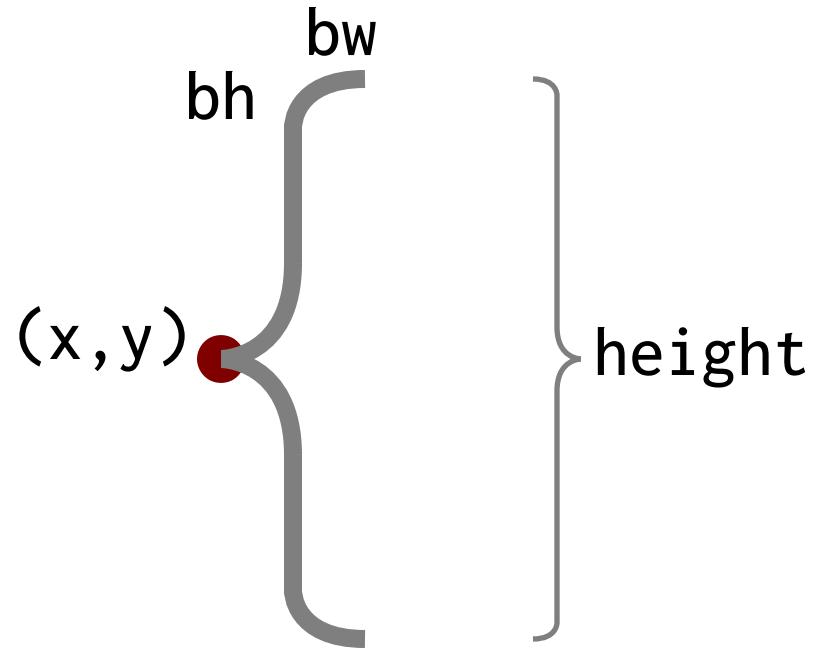
dcarrow 15 35 30 30 20



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

Braces and Brackets

| description | keyword | mandatory | optional |
|---------------|-----------------------|-------------------------------|--------------------------|
| Left brace | <code>lbrace</code> | <code>x y height bw bh</code> | <code>lw color op</code> |
| Right brace | <code>rbrace</code> | <code>x y height bw bh</code> | <code>lw color op</code> |
| Up brace | <code>ubrace</code> | <code>x y width bw bh</code> | <code>lw color op</code> |
| Down brace | <code>dbrace</code> | <code>x y width bw bh</code> | <code>lw color op</code> |
| Left bracket | <code>lbracket</code> | <code>x y width height</code> | <code>lw color op</code> |
| Right bracket | <code>rbracket</code> | <code>x y width height</code> | <code>lw color op</code> |
| Up bracket | <code>ubracket</code> | <code>x y width height</code> | <code>lw color op</code> |
| Down bracket | <code>dbracket</code> | <code>x y width height</code> | <code>lw color op</code> |



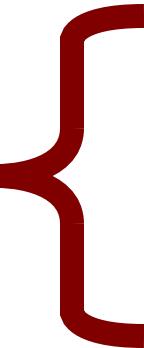
lbrace x y height bw bh lw color op



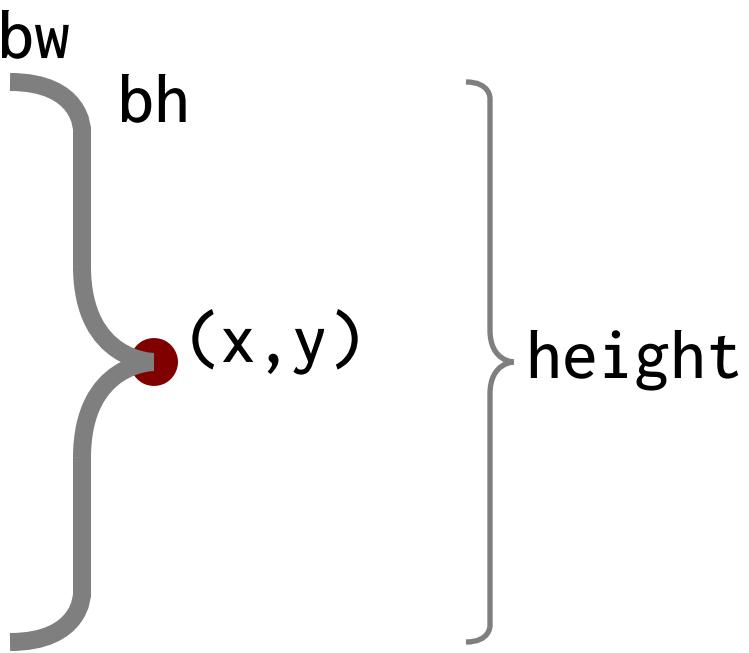
lbrace 20 25 20 2 2



lbrace 50 25 20 4 4 1

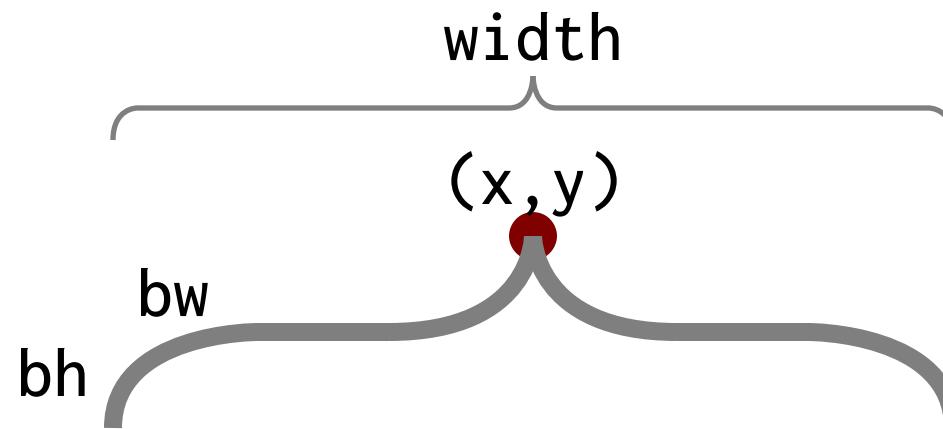


lbrace 80 25 20 6 3 1 "maroon"



rbrace x y height bw bh 1w color op

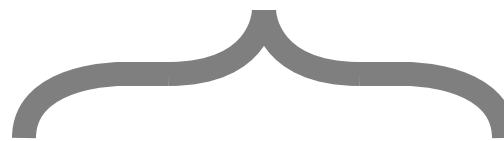
rbrace 20 25 20 2 2 rbrace 50 25 20 4 4 1 rbrace 80 25 20 6 3 1 "maroon"



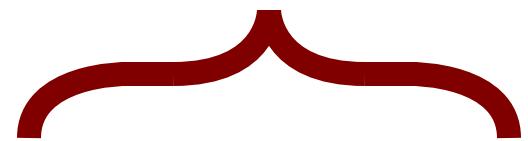
ubrake x y width bw bh lw color op



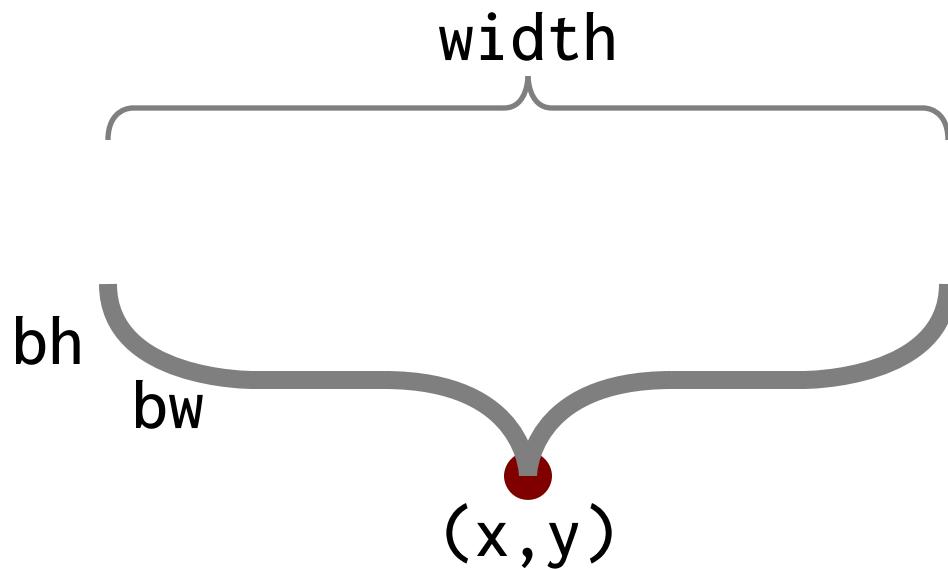
ubrake 20 25 20 2 4



ubrake 50 25 20 4 8 1



ubrake 80 25 20 4 8 1 "maroon"



dbrace x y width bw bh lw color op



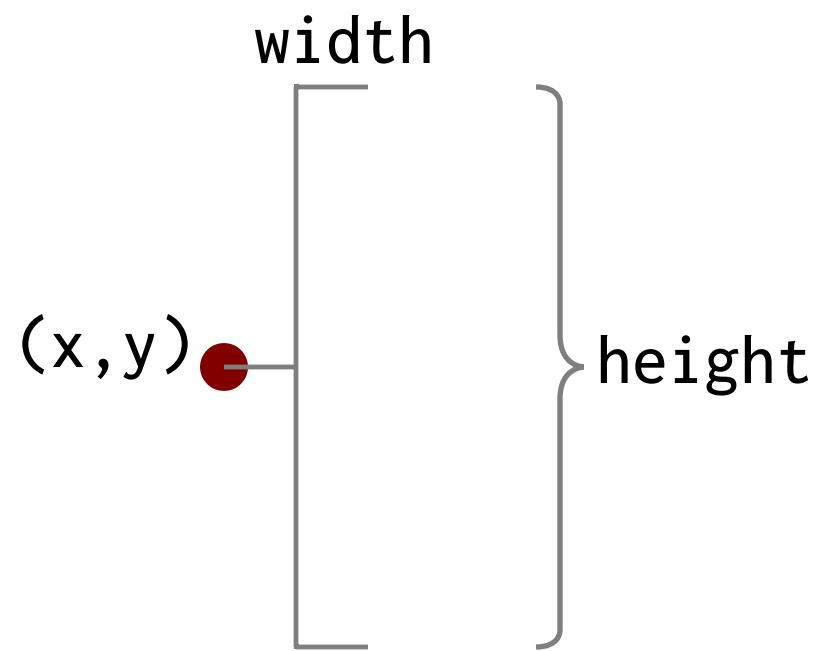
dbrace 20 25 20 2 4



dbrace 50 25 20 4 8 1



dbrace 80 25 20 4 8 1 "maroon"



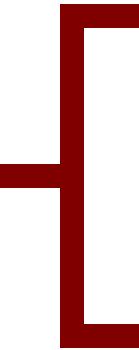
lbracket x y width height lw color op



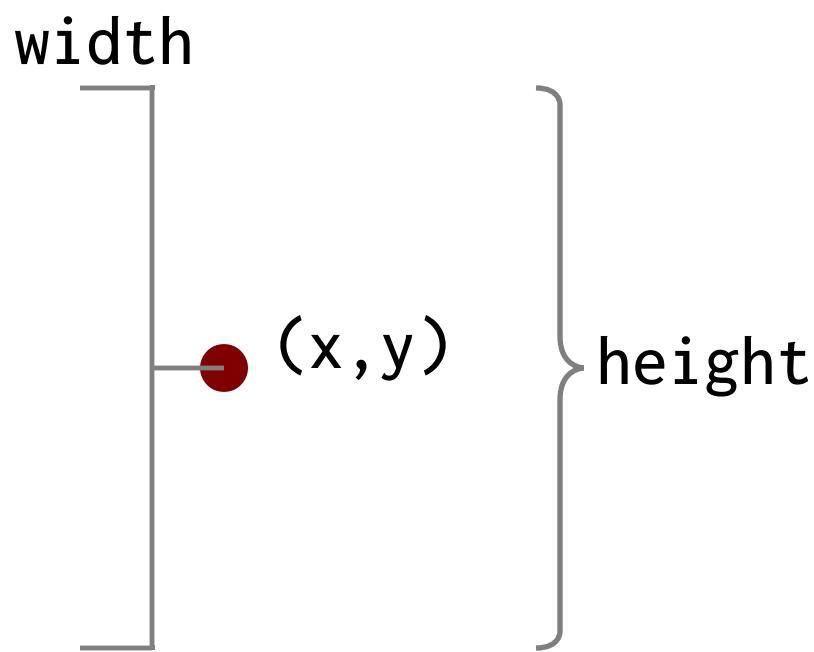
lbrace 20 25 2 20



lbracket 50 25 4 20 1



lbracket 80 25 6 20 1 "maroon"

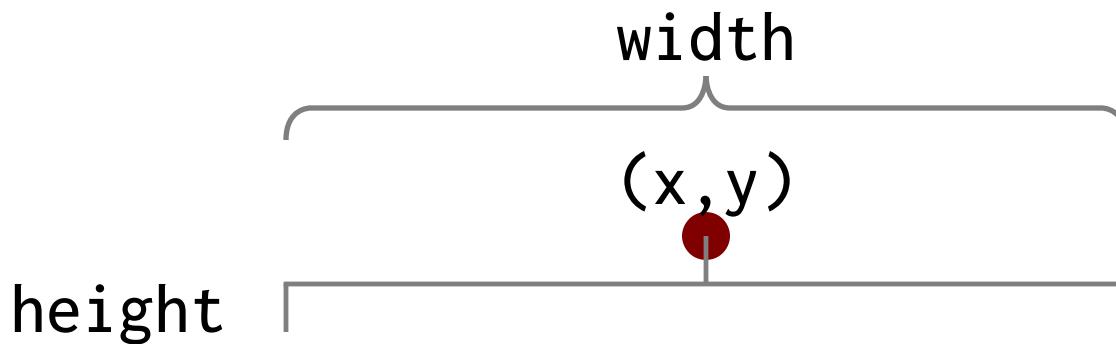


rbrace x y width height lw color op

lbrace 20 25 2 20

rbrace 50 25 4 20 1

rbrace 80 25 6 20 1 "maroon"



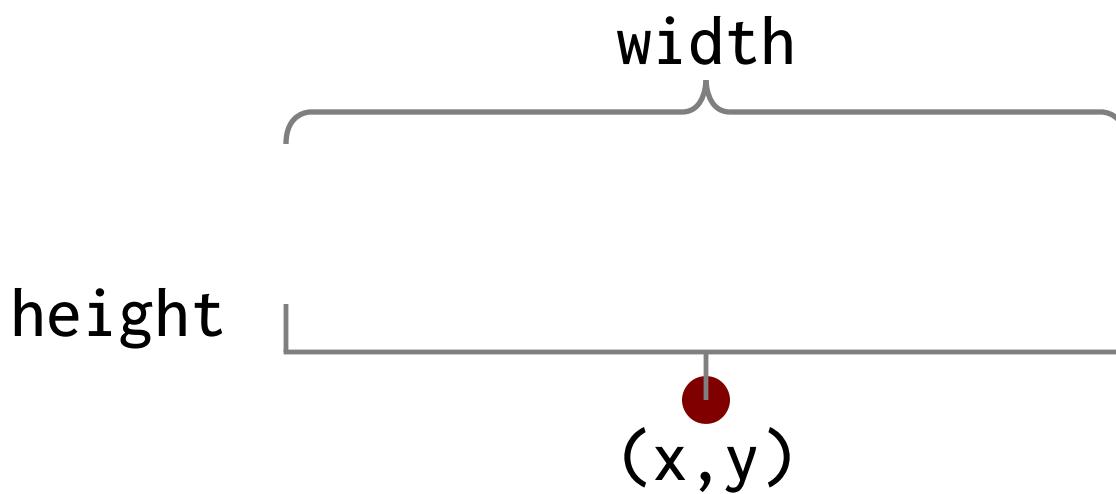
ubracket x y width height lw color op



ubracket 20 25 20 4

ubracket 50 25 20 4 0.3

ubracket 80 25 20 4 1 "maroon"



dbracket x y width height lw color op



dbracket 20 25 20 4



dbracket 50 25 20 4 0.3



dbracket 80 25 20 4 1 "maroon"

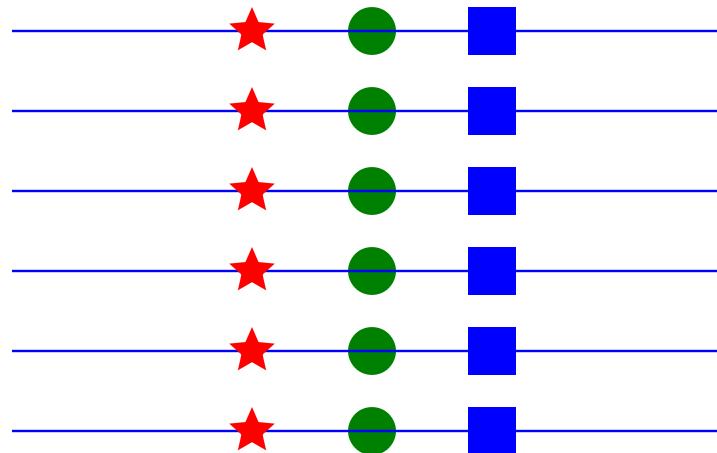
Loop, If, Built-ins

| description | keyword | mandatory |
|----------------------|---------------------------|---|
| Loop | <code>for v=</code> | <code>begin end [increment] ... efor</code> |
| Conditional | <code>if</code> | <code>condition ... [else] ... eif</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> |
| Polar coordinates | <code>value=polar</code> | <code>x y radius angle</code> |
| Area | <code>value=area</code> | <code>expression</code> |
| Formatted text | <code>value=format</code> | <code>fmt expression or up to 5 args</code> |
| Substring | <code>value=substr</code> | <code>string begin end</code> |
| Random number | <code>value=random</code> | <code>min max</code> |
| Value mapping | <code>value=vmap</code> | <code>data min1 max1 min2 max2</code> |
| Define function | <code>def</code> | <code>name arg1 ... argn ... edef</code> |
| Import function | <code>import</code> | <code>"file"</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> |
| Rulers | <code>ruler</code> | <code>increment [color]</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
```



if condition

... statements when true

else

... statements when false

eif

} else block
may be omitted

if condition ... else ... eif

Condition

if a == b
if a != b
if a > b
if a < b
if a >= b
if a <= b
if a >< b c

Description

if a equals b
if a not equal to b
if a less than b
if a greater than b
if a greater than or equal to b
if a less than or equal to b
if a is between b and c

a=60

b=3

if a > b

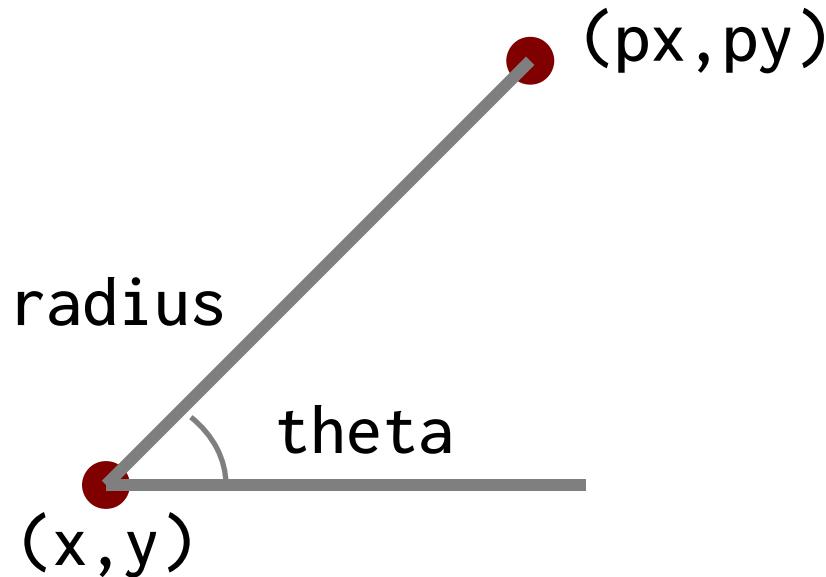
text "hello" a b 2.5 "sans" "red"

else

text "bye" a b 2.5 "sans" "blue"

eif

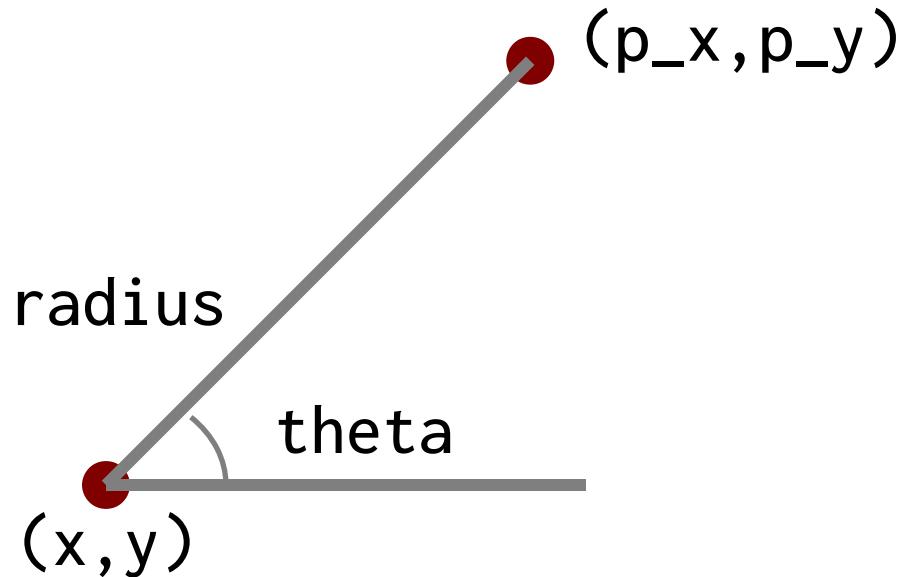
hello



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

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





p=polar x y radius theta

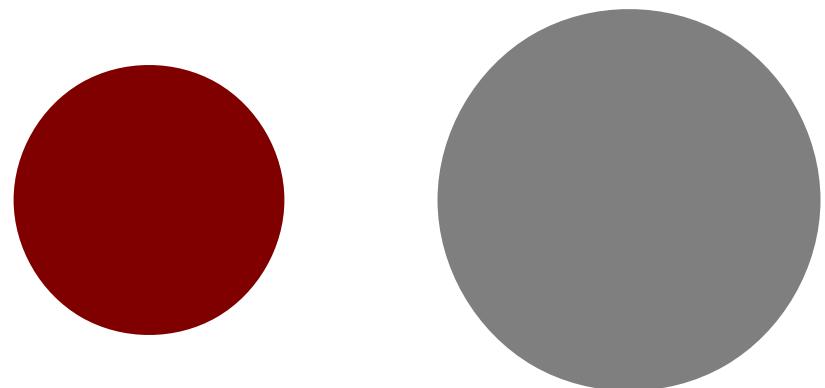
```
cpx=60  
cpy=20  
point=polar cpx cpy 10 30  
line cpx cpy point_x point_y  
circle cpx cpy 1 "gray"  
circle point_x point_y 2 "maroon"
```



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 or up to 5 args

v1=100.3
v2=200.234
pi=3.1415926
title=format "%,.2f Million (USD)" v

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

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

```
args=format "Multiple args (%v,%v,%.3f)" 80 10 pi
```

ctext title 80 30 4 "sans" "maroon"

ctext subtitle 80 20 3 "sans" "gray"

ctext args 80 10 2 "mono"

100.30 Million (USD)

Total value: 300.53

Multiple args (80,10,3.142)

```
s="hello, world"  
h=substr s 3 8  
      ↑ ↑  
 "lo, wo"    begin   end
```

value=**substr** string begin end

```
now="Now is the time for all good men"  
s1=substr now 0 14  
s2=substr now 16 18  
s3=substr now 24 end  
ctext s1 70 34 3  
ctext s2 70 24 3  
ctext s3 70 15 3
```

Now is the time
for
good men



value=random min max



rx1=random 5 30

ry1=random 15 35

circle rx1 ry1 3 "maroon"

rx2=random 40 60

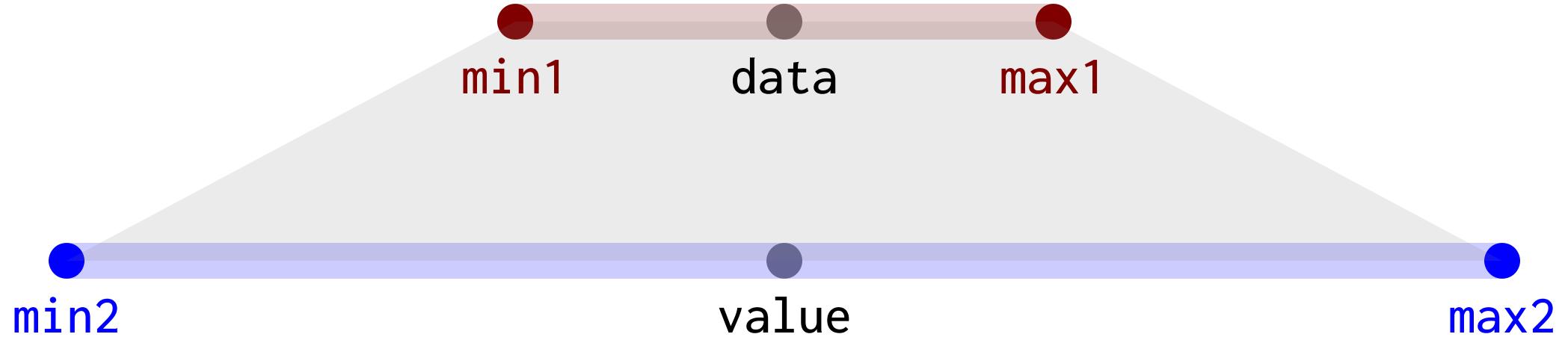
ry2=random 15 35

circle rx2 ry2 3 "green"

rx1=random 75 95

ry1=random 15 35

circle rx3 ry3 3 "blue"



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"
```

```
import "doit.dsh"
```

contents of "doit.dsh"

```
def doit fx fy fs ft  
    ctext ft fx fy fs "serif" "purple"  
edef
```

```
doit 50 20 2.5 "hello"
```

fx=50

fs=2.5

ft="hello"

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

```
import "file"
```

calling the function

call again

```
doit 50 30 5 "calling the function"  
doit 50 20 4 "call again"
```

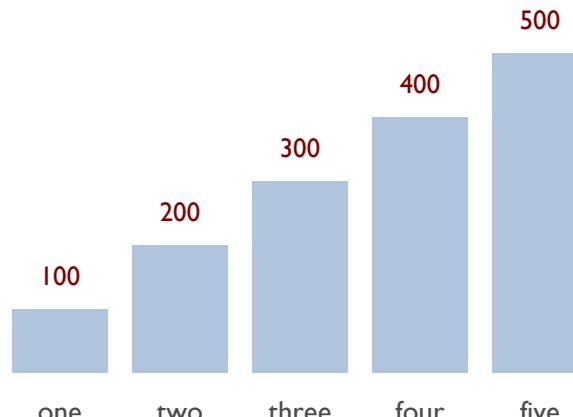
```
data "file.d" ← data file  
first 20  
second 100 } data values  
third 200  
edata
```

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

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

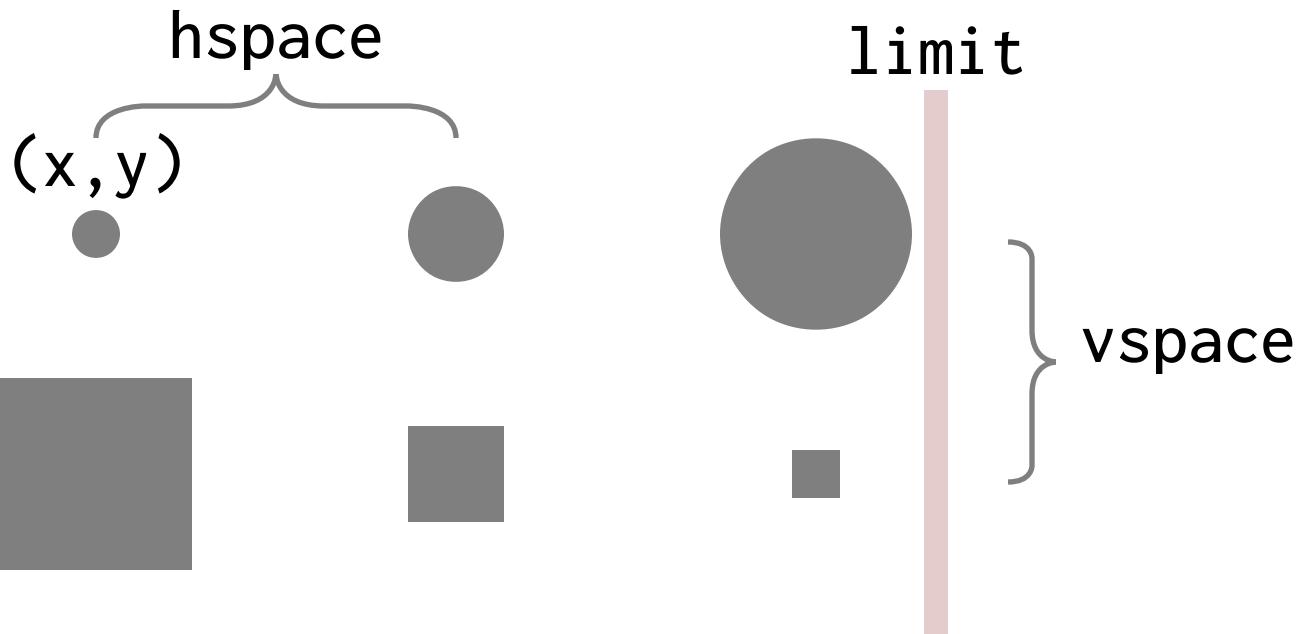
```
edata
```

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



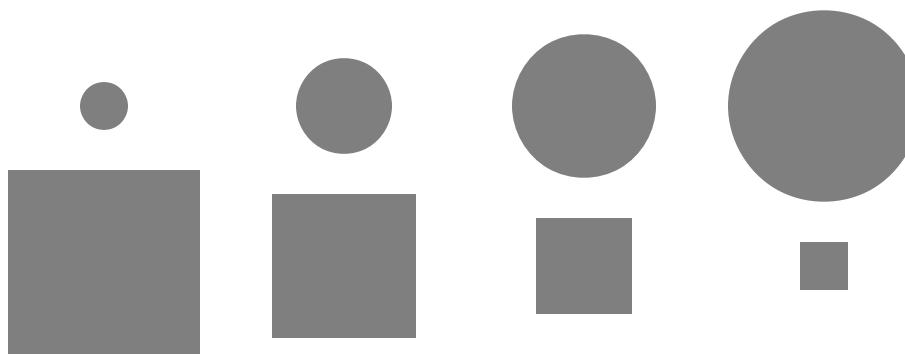
file

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

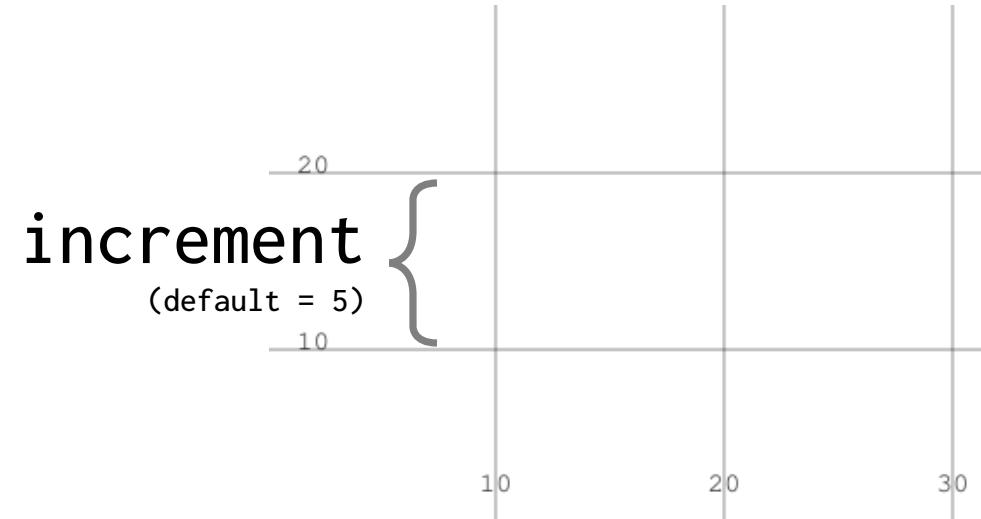


grid "file" x y hspace vspace limit

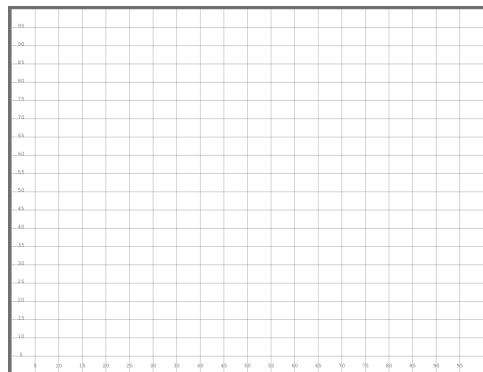
```
circle x y 2
circle x y 4
circle x y 6
circle x y 8
square x y 8
square x y 6
square x y 4
square x y 2
```



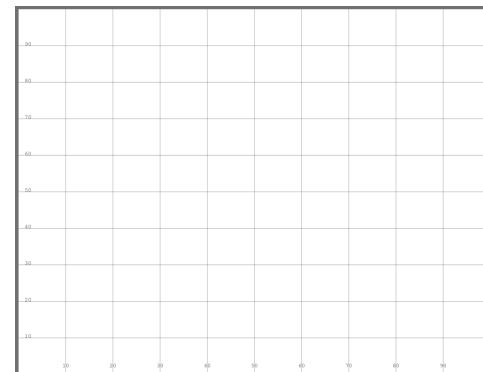
grid "code/grid-ex.dsh" 35 33 10 10 65



ruler increment color



ruler



ruler 10



ruler 2 "red"

Math Functions

| description | keyword | mandatory |
|-------------|---------|----------------------|
| Cosine | cosine | number or expression |
| Sine | sine | number or expression |
| Square Root | sqrt | number or expression |
| Tangent | tangent | number or expression |

a=3.14159265359

b=2*a

x=cosine 4 ← x = -1

y=cosine a ← y = -0.65364

n=cosine a+b ← n = -1

value=**cosine** number or expression

a=10

b=71

x=sin 4 ← x = -0.75680

y=sin a ← y = -0.5440

n=sin a+b ← n = -0.62989

value=sine number or expression

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

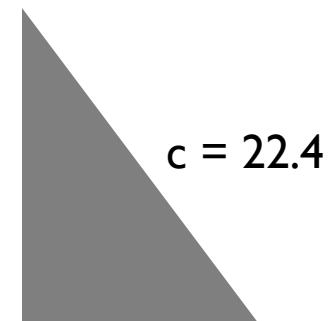
w=70+10

h=15+20

polygon "70 w 70" "15 15 h"

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

text xlabel 76 25 2



a=10

b=71

x=tangent 4 ← x = 1.1578213

y=tangent a ← y = 0.6483608

n=tangent a+b ← n = -0.8109944

value=tangent number or expression

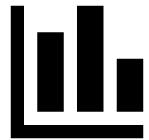
Charts

| description | keyword | mandatory | optional |
|----------------------|-----------|----------------------------|----------|
| General Charts | dchart | options "file" | |
| Chart Legends | legend | "text" x y size font color | |
| Area Chart | areachart | "file" | color |
| Bar Chart | barchart | "file" | color |
| Dot Chart | dotchart | "file" | color |
| Horizontal Bar Chart | hbarchart | "file" | color |
| Line Chart | linechart | "file" | color |
| Word Bar Chart | wbarchart | "file" | color |
| Proportional Map | pmap | "file" | size |
| Pie Chart | pie | "file" | size |
| Donut Chart | donut | "file" | size |

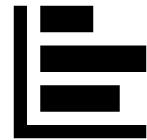
Chart Variables

| description | variable | default value |
|-----------------------|---------------|--------------------------------------|
| Chart Top | chartTop | 80 |
| Chart Bottom | chartBottom | 30 |
| Chart Left | chartLeft | 10 |
| Chart Right | chartRight | 90 |
| Chart text size | chartTextSize | 1.5 |
| Show data values | chartVal | 1 (0: off, 1: on) |
| Show Y-axis grid | chartGrid | 0 (0: off, 1: on) |
| Show title | chartTitle | 1 (0: off, 1: on) |
| X-axis label interval | chartXLabel | 1 (1: all, 0: none, every nth label) |
| Y-axis range | chartYRange | "" (min,max,interval) |

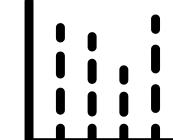
dcharts types



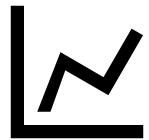
Column



Bar



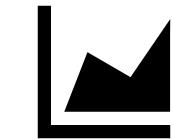
Dot



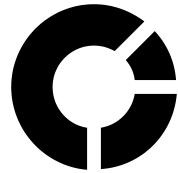
Line



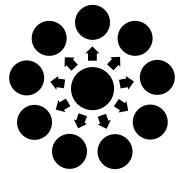
Scatter



Area



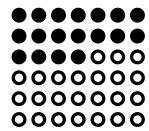
Donut/Pie



Radial



Pmap



Waffle/Lego



Fan



Bowtie

dchart options: chart types

| option | default | description |
|----------|---------|----------------------|
| -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 |

dchart options: elements

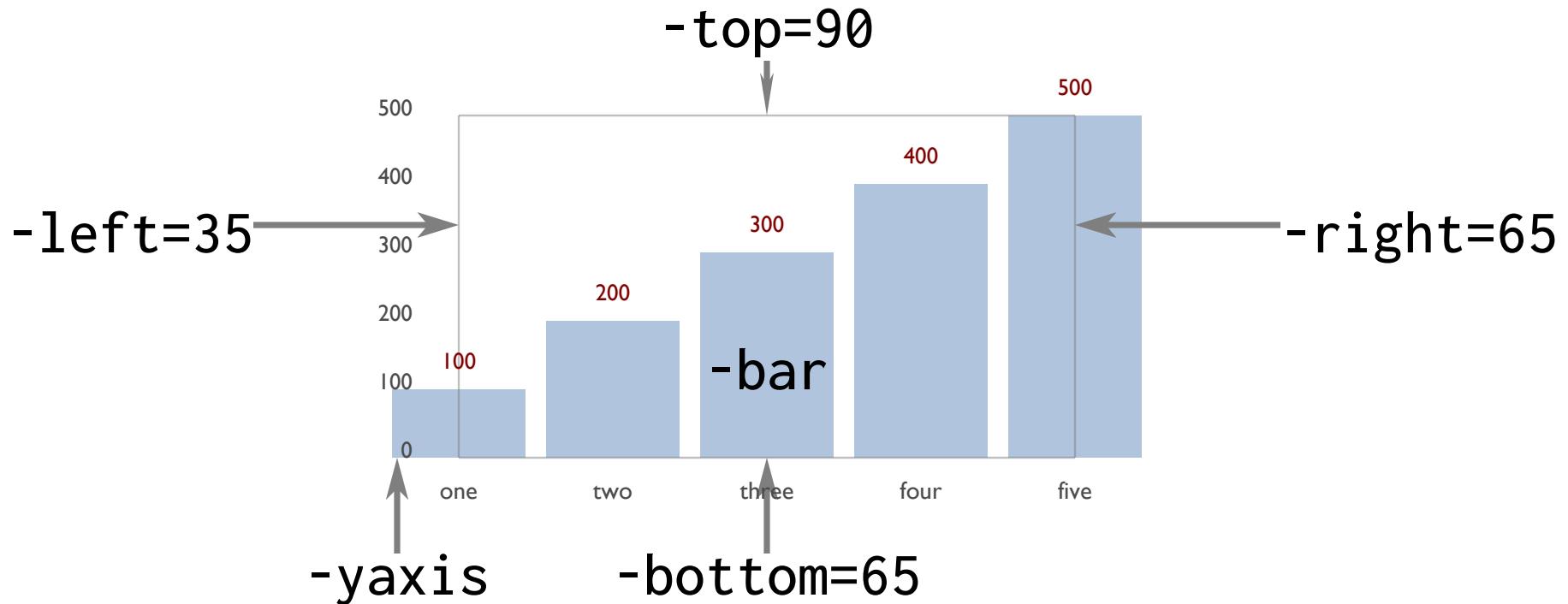
| option | default | description |
|-------------|---------------------------|--------------------------------|
| -csv | false | read CSV files |
| -frame | false | show a colored frame |
| -fulldeck | true | generate full deck markup |
| -grid | false | show gridlines on the y axis |
| -note | true | 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 |
| -charttitle | 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 |

dchart options: measures and attributes

| option | default | description |
|-------------|---------------------------|----------------------------|
| -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 options: position and scaling

| option | default | description |
|---------|----------|----------------------------|
| -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 |
| -bounds | "" | set left,right,top,bottom |



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"
```



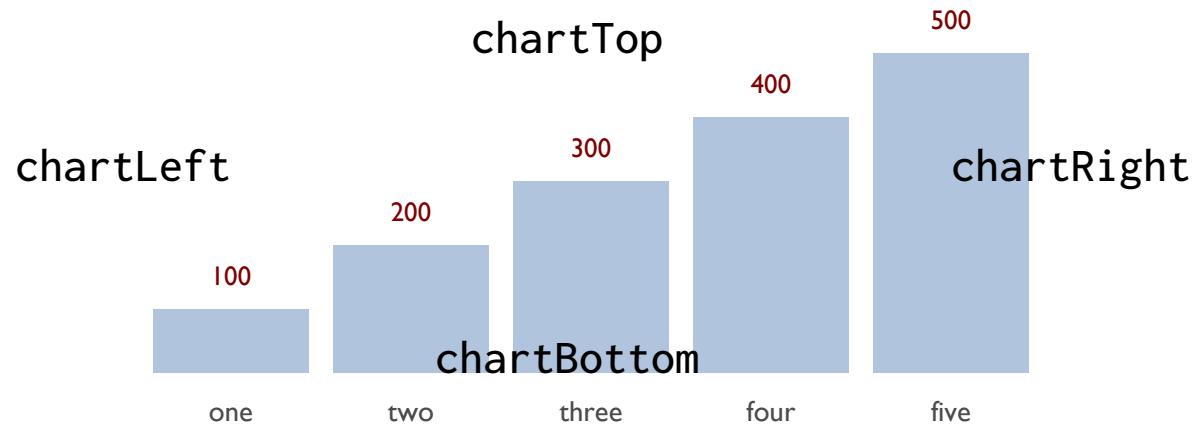
```
legend "text" x y fontsize font color
```

■ Item on the chart

■ Thing

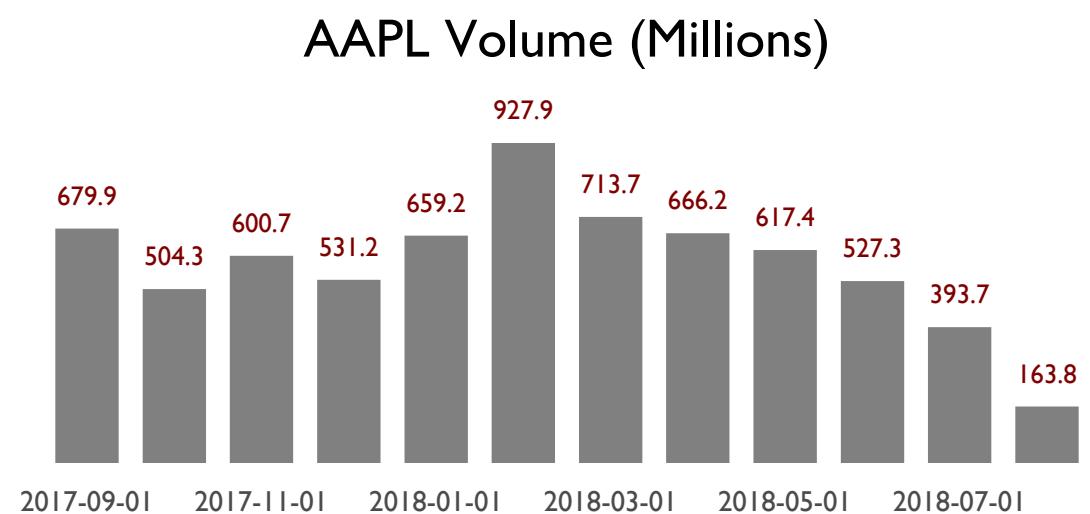
```
legend "Item on the chart" 20 30 3 "sans" "red"
```

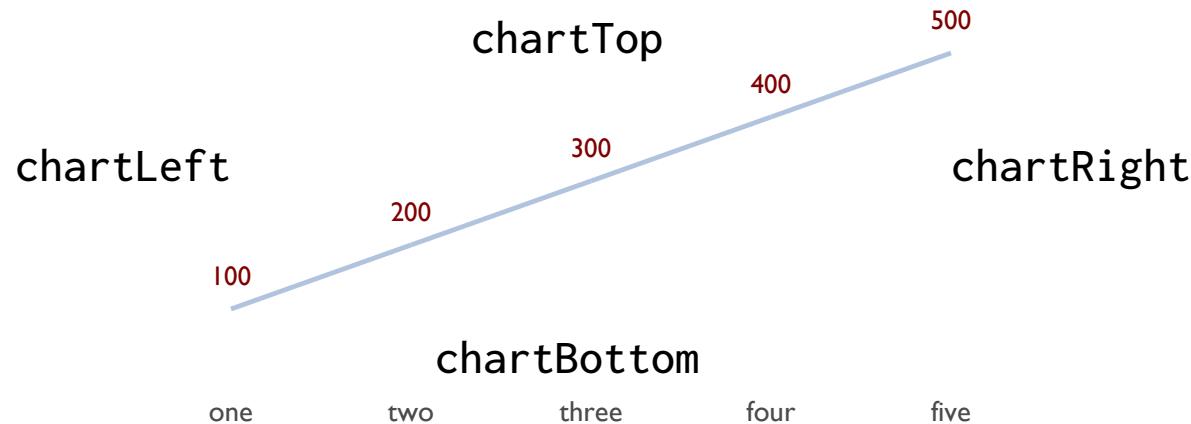
```
legend "Thing" 70 30 2 "serif" "blue"
```



barchart "file"color

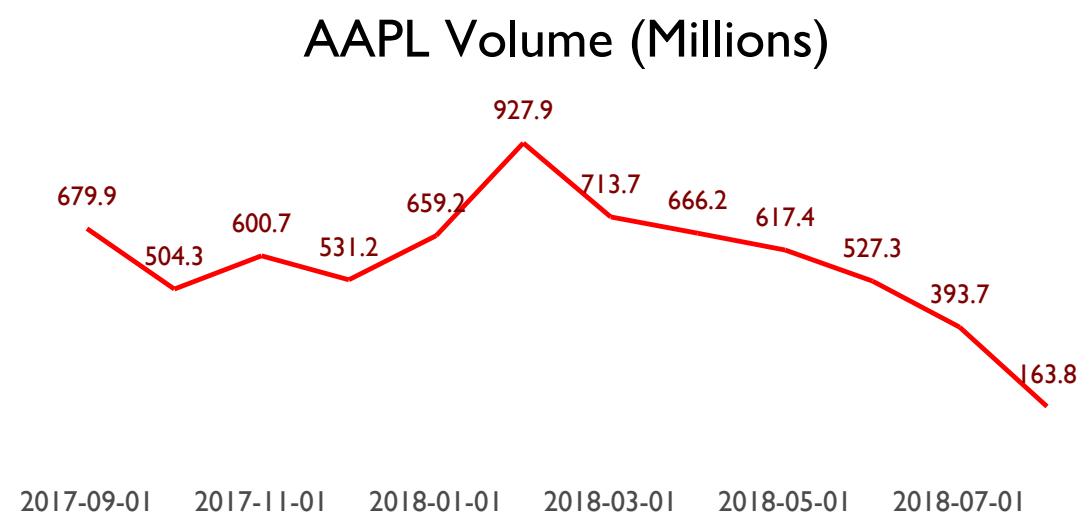
```
chartLeft=50
chartRight=90
chartTop=30
chartBottom=10
chartXLabel=2
barchart "AAPL.d" "gray"
```

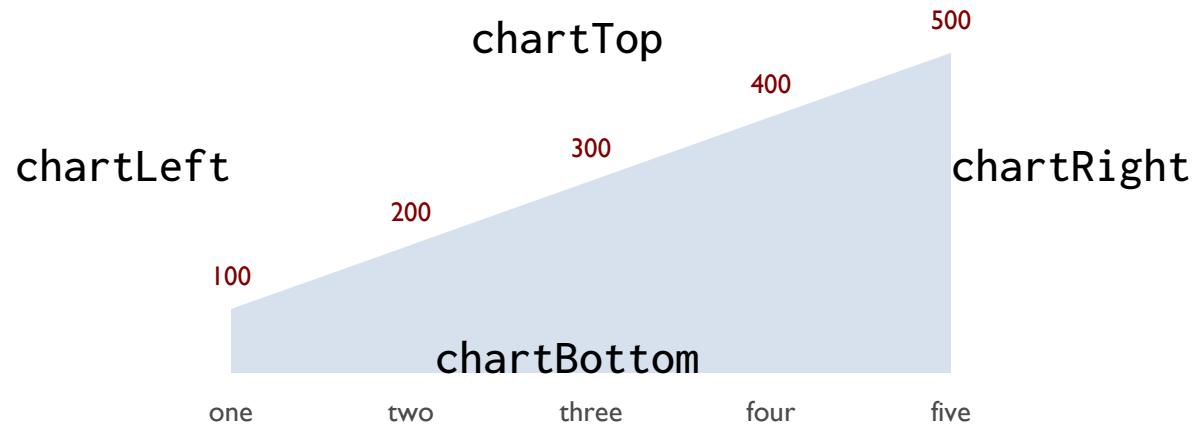




linechart "file"color

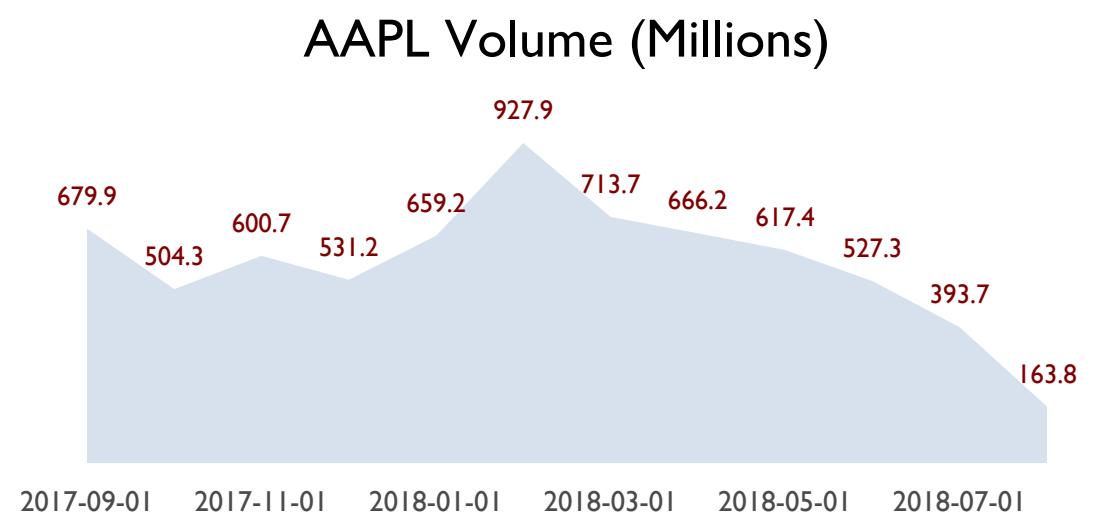
```
chartLeft=50  
chartRight=90  
chartTop=30  
chartBottom=10  
chartXLabel=2  
linechart "AAPL.d" "red"
```

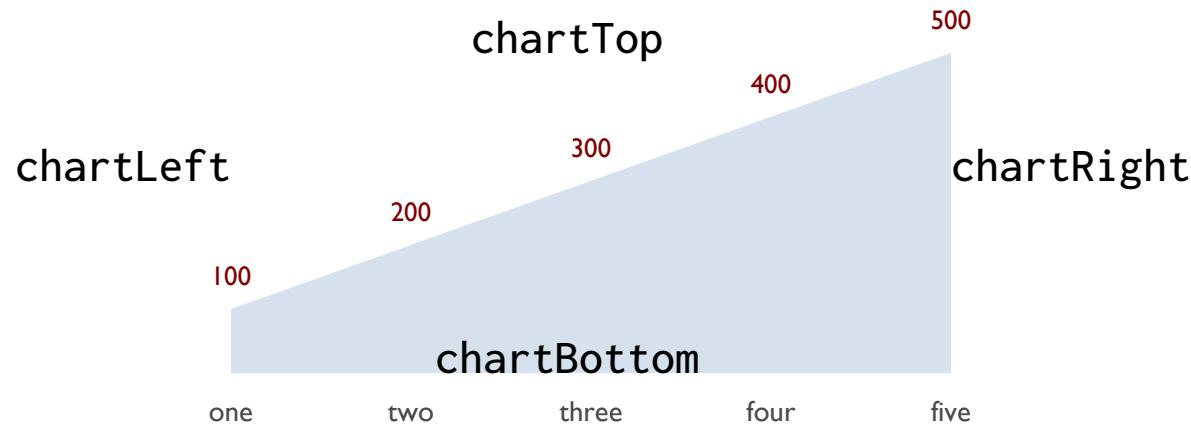




areachart "file"color

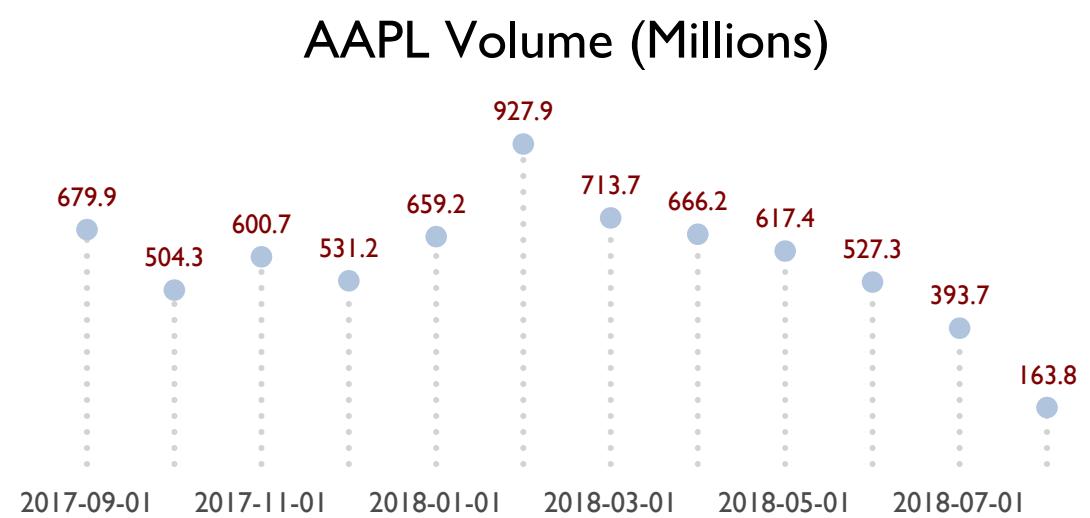
```
chartLeft=50
chartRight=90
chartTop=30
chartBottom=10
chartXLabel=2
areachart "AAPL.d"
```

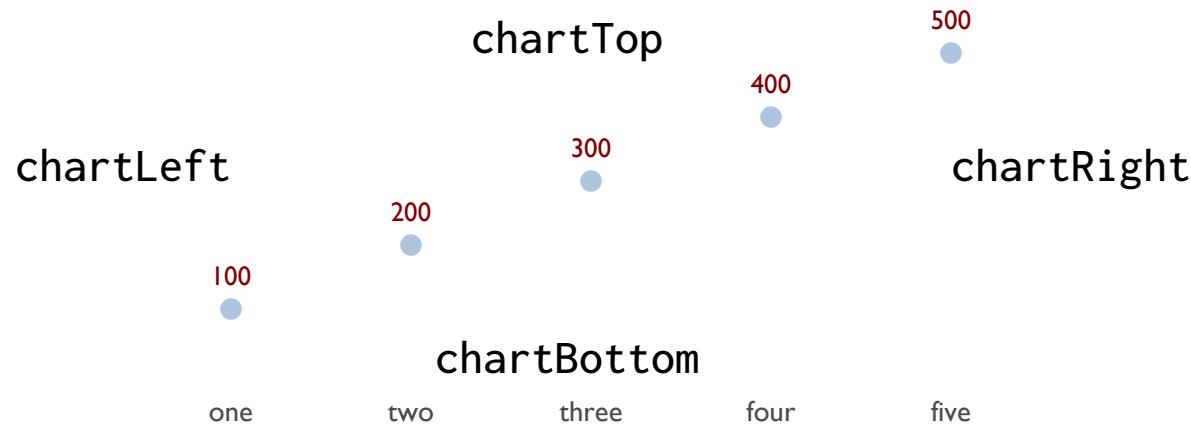




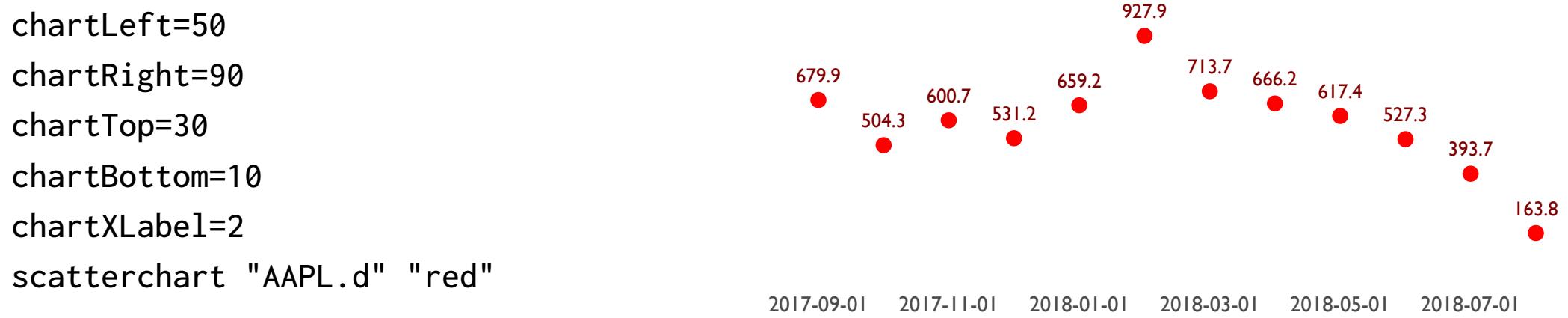
areachart "file"color

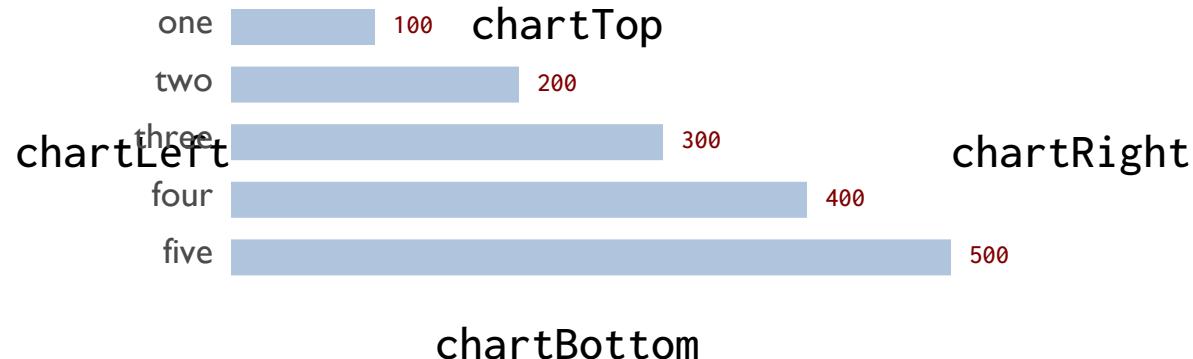
chartLeft=50
chartRight=90
chartTop=30
chartBottom=10
chartXLabel=2
dotchart "AAPL.d"





scatterchart "file" color





hbar chart "file" color

chartLeft=50

chartRight=90

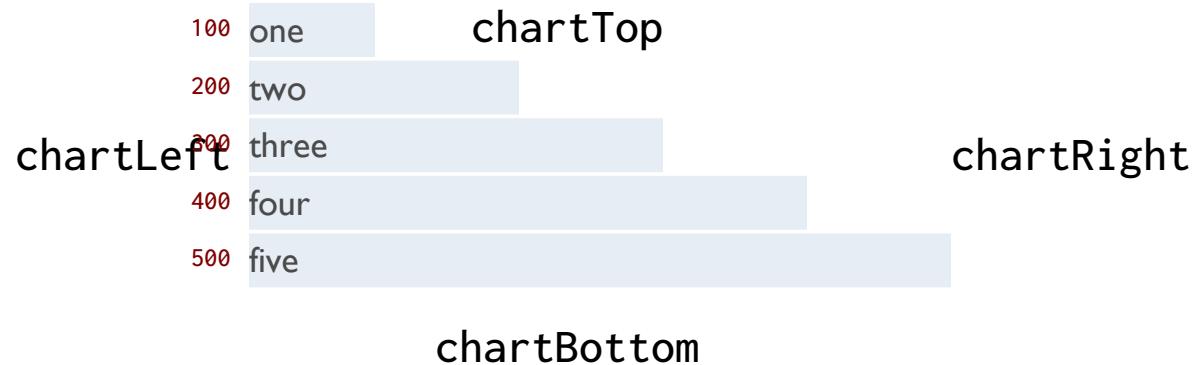
chartTop=30

chartBottom=10

chartXLabel=2

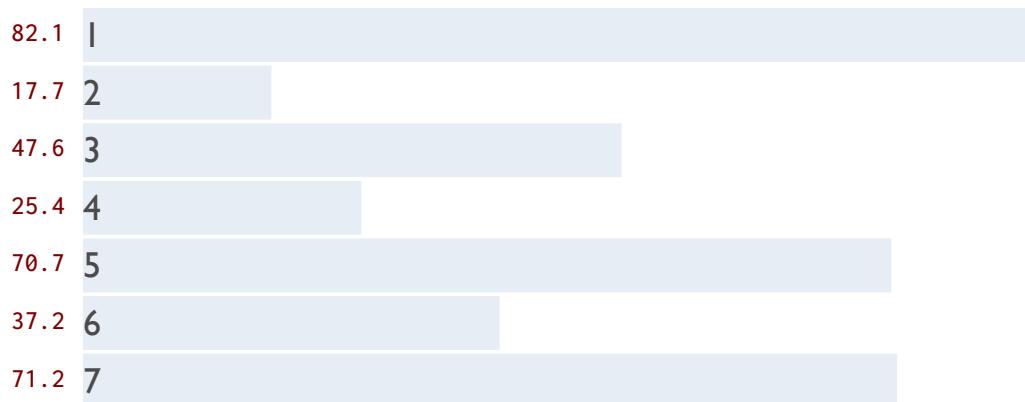
hbar chart "rand.d" "maroon"





wbarchart "file" color

chartLeft=50
chartRight=90
chartTop=30
chartBottom=10
chartXLabel=2
wbarchart "rand.d"



chartTop



pmap "file" size

chartLeft=25

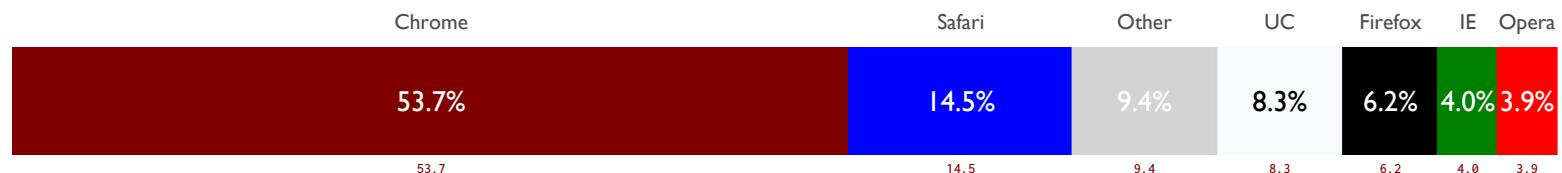
chartTop=25

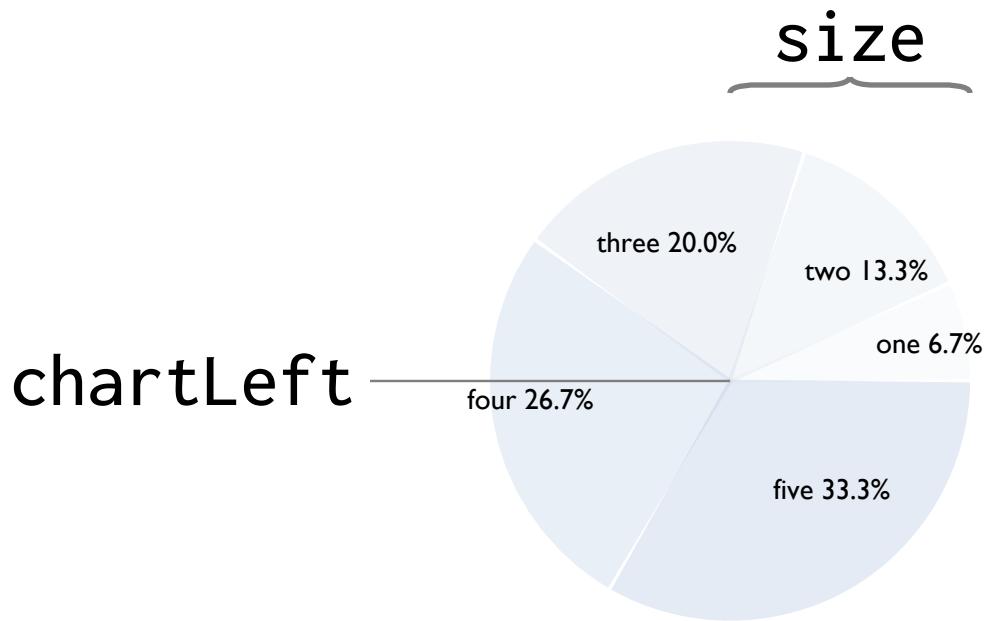
chartRight=90

chartTitle=0

chartTextSize=1.2

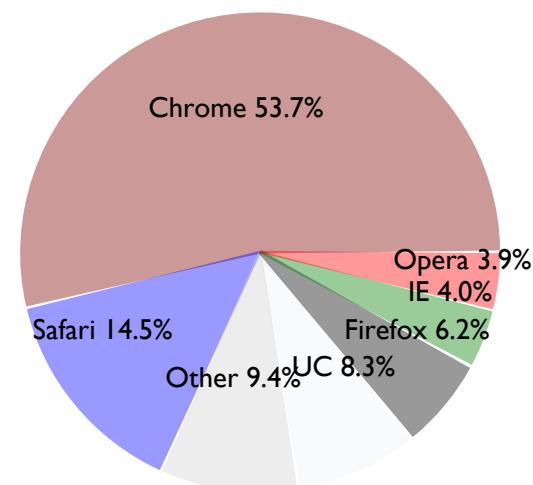
pmap "browser.d"

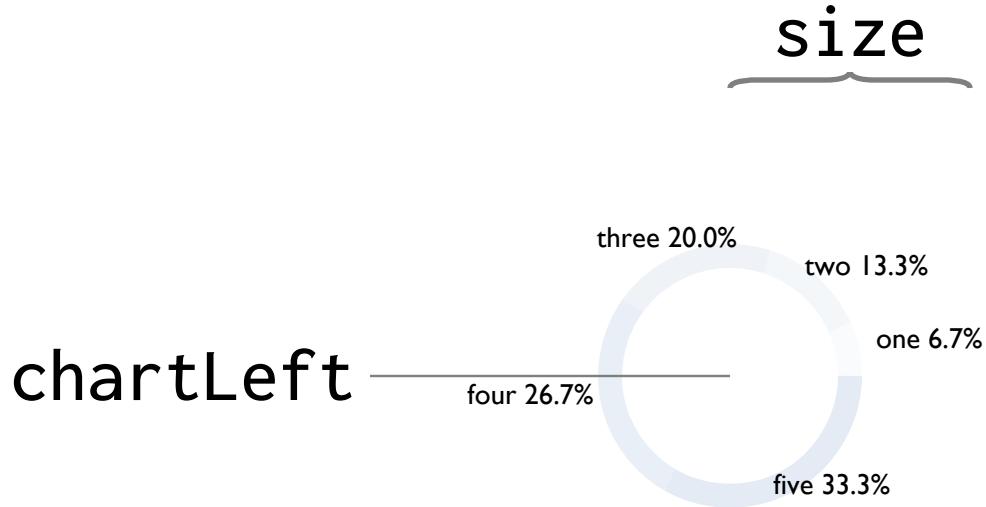




pie "file" size

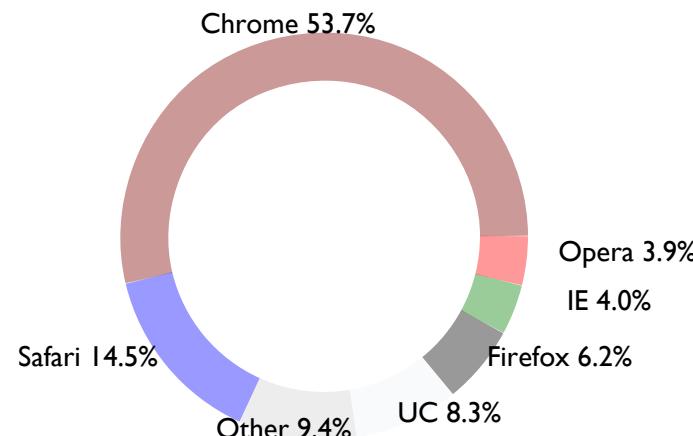
```
chartLeft=50  
chartTop=25  
chartRight=95  
chartTextSize=1.2  
chartTitle=0  
pie "browser.d" 10
```





donut "file" size width

```
chartLeft=50  
chartTop=30  
chartRight=60  
chartTextSize=1.2  
chartTitle=0  
donut "browser.d" 2 15
```



Geographic Functions

| description | keyword | mandatory | optional |
|----------------------|-------------|-----------|--------------------------|
| Geographic Regions | georegion | "file" | color op |
| Geographic Borders | geoborder | "file" | lw color op |
| Text labels | geolabel | "loc" | size font color op |
| Dot markers | geomark | "loc" | size color op |
| Text with markers | geoloc | "loc" | align size font color op |
| Place images | geoimage | "loc" w h | |
| Lines between points | geopath | "p1" "p2" | lw color op |
| Arcs between points | geoarc | "p1" "p2" | lw color op |
| Lines between points | geopathfile | "file" | lw color op |

"file" refer to Shapefile (.shp), GeoJSON (.json or .geojson) or Keyhole Markup Language (.kml) files from opendatasoft

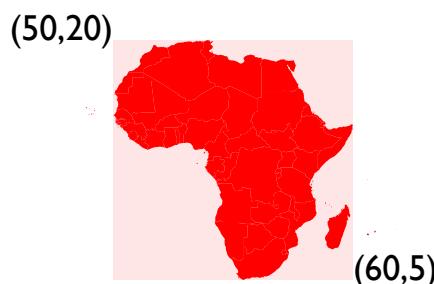
"loc" refers to a geo URI string ("geo:lat,long"), or a filename containing multiple locations

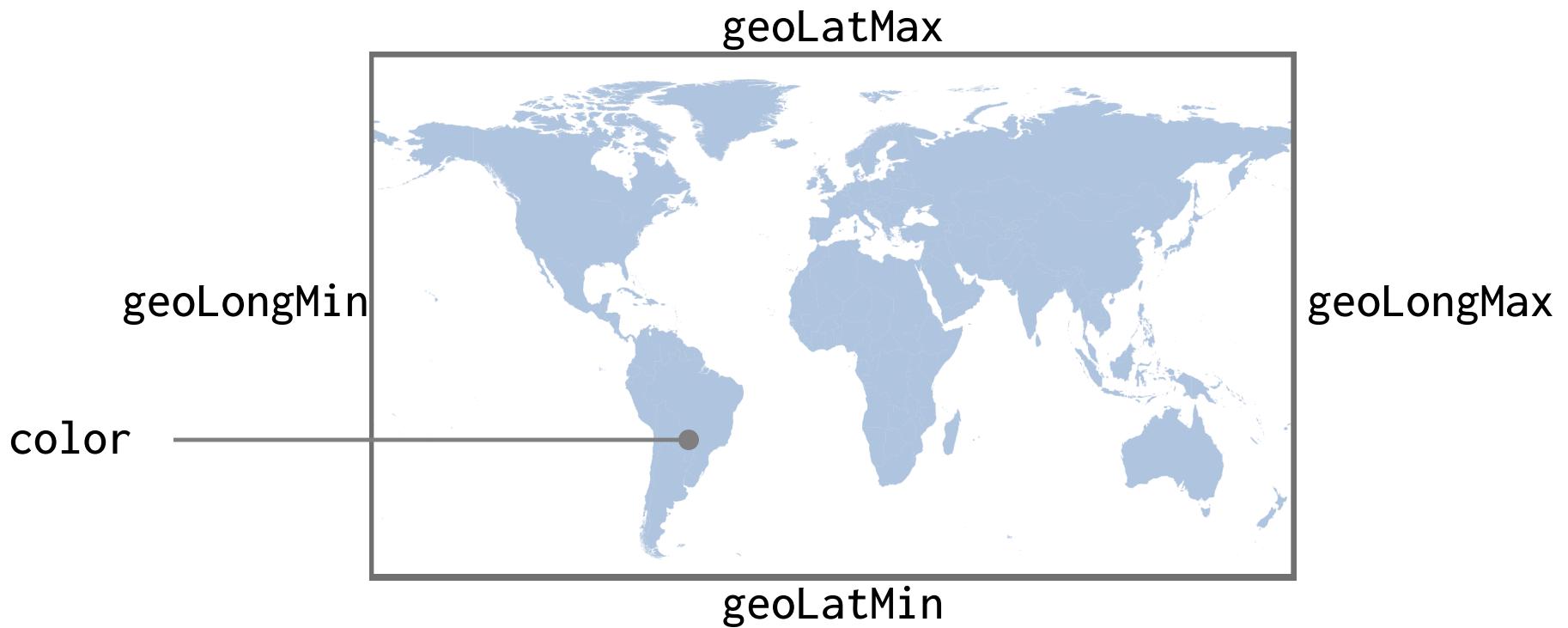
"p1" and "p2" are geo URIs

Geo Variables

| description | variable | default value |
|----------------------|------------|---------------|
| Minimum latitude | geoLatMin | -90 |
| Maximum latitude | geoLatMax | 90 |
| Minimum longitude | geoLongMin | -180 |
| Maximum longitude | geoLongMax | 180 |
| Geo canvas x minimum | geoXmin | 0 |
| Geo canvas x maximum | geoXmax | 100 |
| Geo canvas y minimum | geoYmin | 0 |
| Geo canvas y maximum | geoYmax | 100 |

Geographic Scaling





georegion "file" color op

geoLatMin=0-60

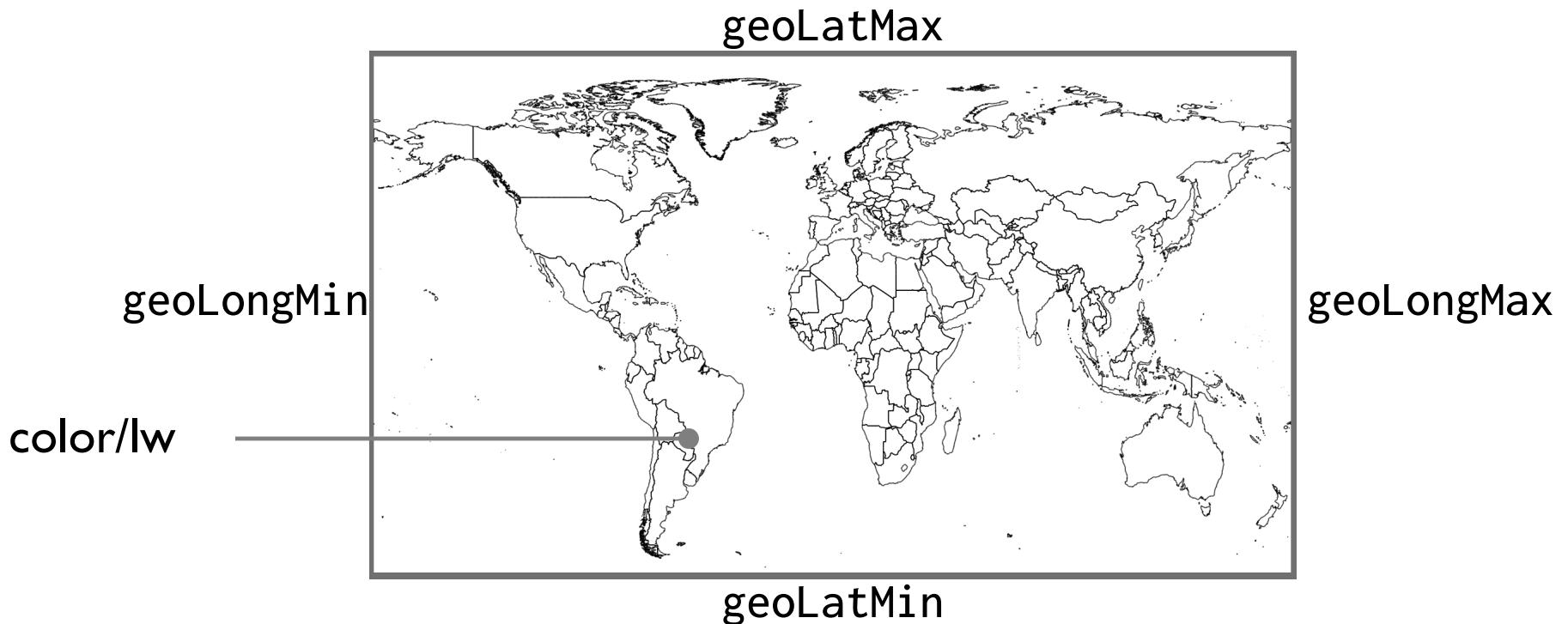
geoLatMax=90

geoLongMin=0-180

geoLongMax=180

georegion "world.kml" "white"





geoborder "file" lw color

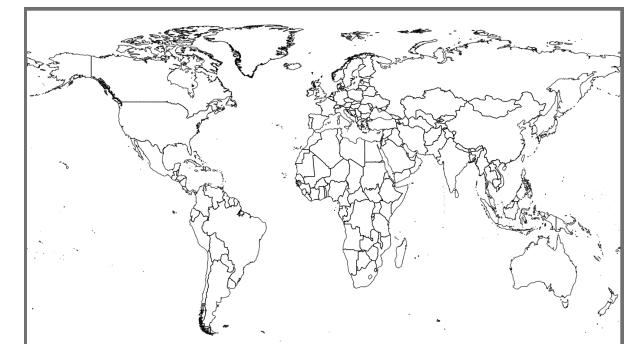
geoLatMin=0-60

geoLatMax=90

geoLongMin=0-180

geoLongMax=180

geoborder "world.kml" 0.1 "black"



geoLatMax

geoLongMin

geo:lat,long<tab>Label

geoLongMax

geoLatMin

geolabel "loc" size color op

geoLatMin=0-60

geoLatMax=90

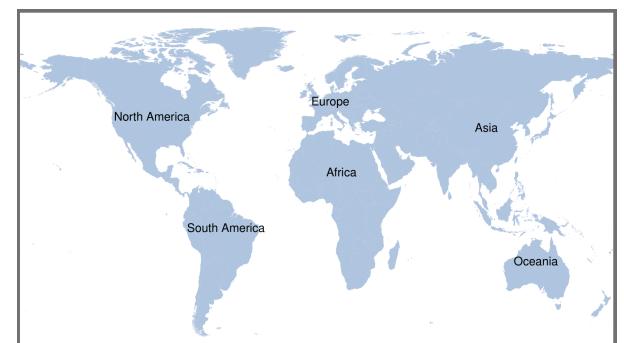
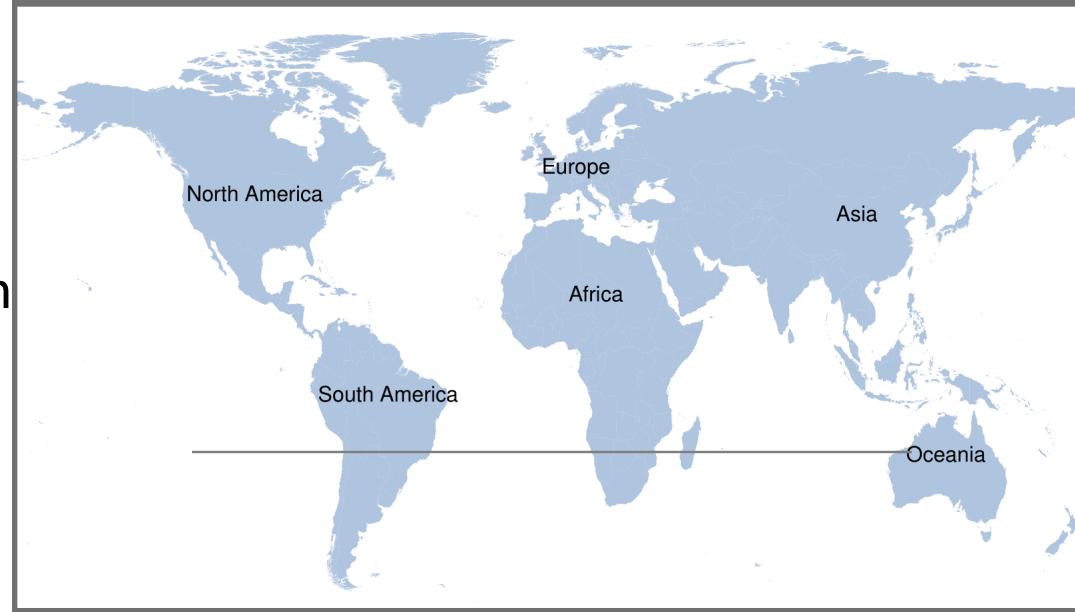
geoLongMin=0-180

geoLongMax=180

| | |
|--------------|---------------|
| geo:-10,-55 | South America |
| geo:40,-100 | North America |
| geo:46.8,8.3 | Europe |
| geo:15,15 | Africa |
| geo:35,103 | Asia |
| geo:-25,133 | Oceania |

georegion "world.kml" "white"

geolabel "continents.d" 2 "sans" "black"



geoLatMax

geoLongMin

geo:lat, long

geoLongMax

geoLatMin

geomark "loc" size color op

geoLatMin=0-60

geoLatMax=90

geoLongMin=0-180

geoLongMax=180

| | |
|------------------------|--------------------------------|
| geo:41.8967,12.4822000 | Rome (41.90°, 12.48°) |
| geo:-18.91368,47.53610 | Antananarivo (-18.91°, 47.54°) |
| geo:-33.8559,151.20670 | Sydney (-33.86°, 151.21°) |
| geo:40.7167,-74.400000 | New York (40.72°, -74.40) |
| ... | |
| geo:34.0500,-118.25000 | Los Angeles (34.05°, -118.25°) |

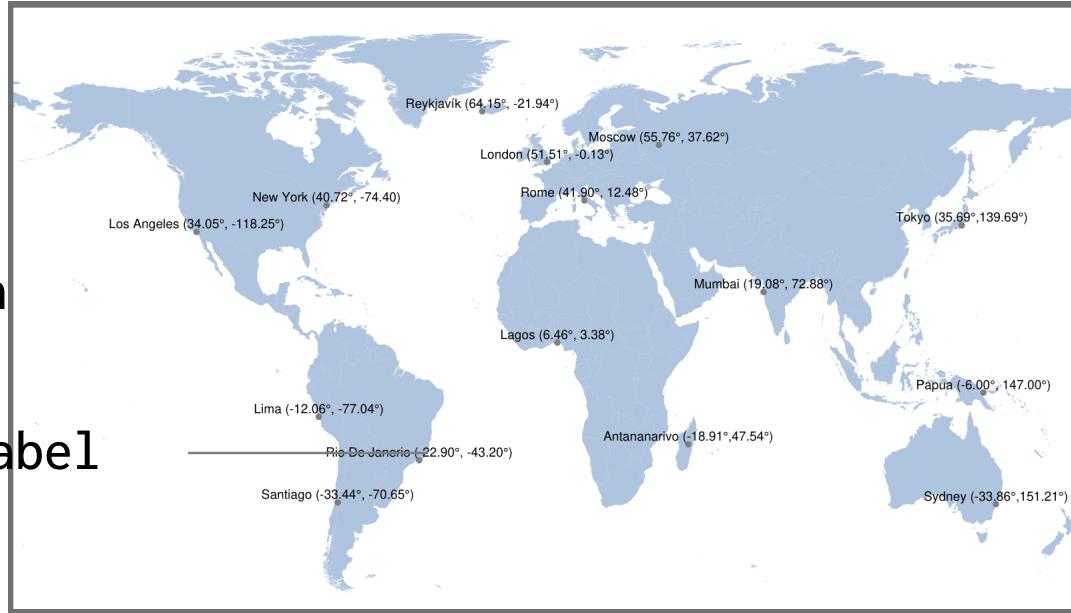
georegion "world.kml" "white"

geolabel "cities.d" 2 "sans" "black"



geoLatMax

geoLongMin
geo:lat, long<tab>Label



geoLongMax

Label Position (pos):
"c" Center above
"b" Begin Aligned
"e" End Aligned
"u" Center below

geoLatMin

geoloc "loc" pos size font color op

geoLatMin=0-60

geoLatMax=90

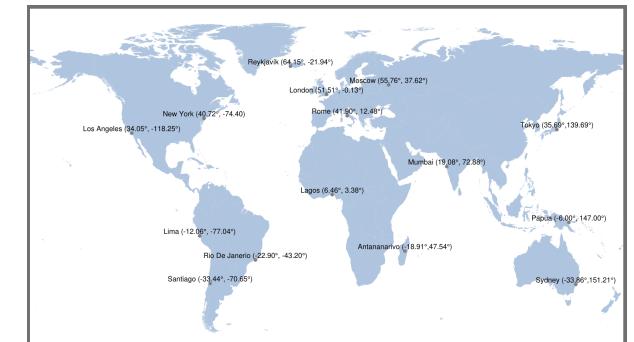
geoLongMin=0-180

geoLongMax=180

georegion "world.kml" "white"

geoloc "cities.d" "c" ts

| Label | Coordinates |
|--------------|--------------------|
| Rome | (41.90°, 12.48°) |
| Antananarivo | (-18.91°, 47.54°) |
| Sydney | (-33.86°, 151.21°) |
| New York | (40.72°, -74.40°) |
| ... | |
| Los Angeles | (34.05°, -118.25°) |



geoLatMax

geoLongMin

geoLongMax

geo:lat,long<tab>imgfile

geoLatMin

geoimage "loc" w h

geoLatMin=25

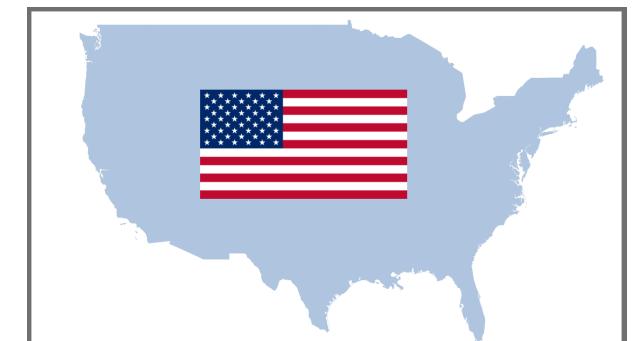
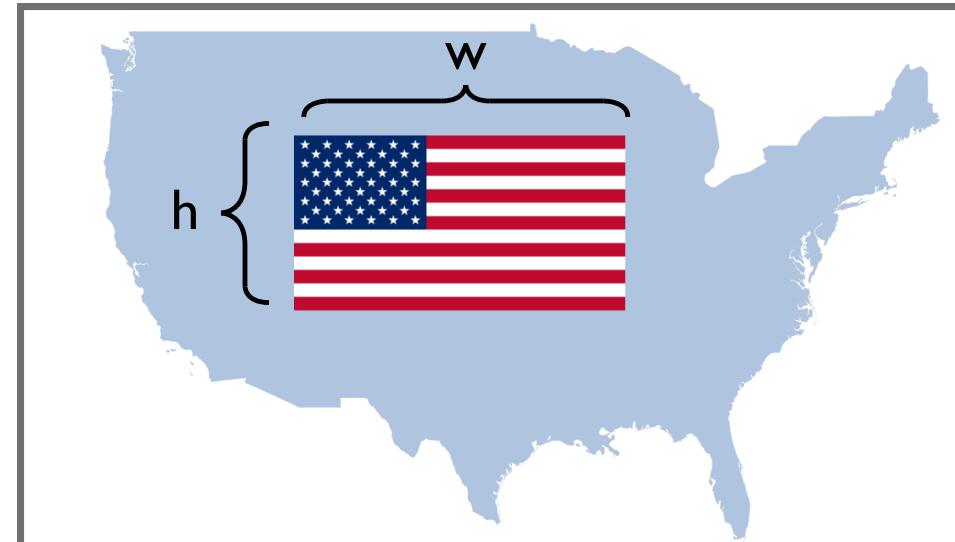
geoLatMax=50

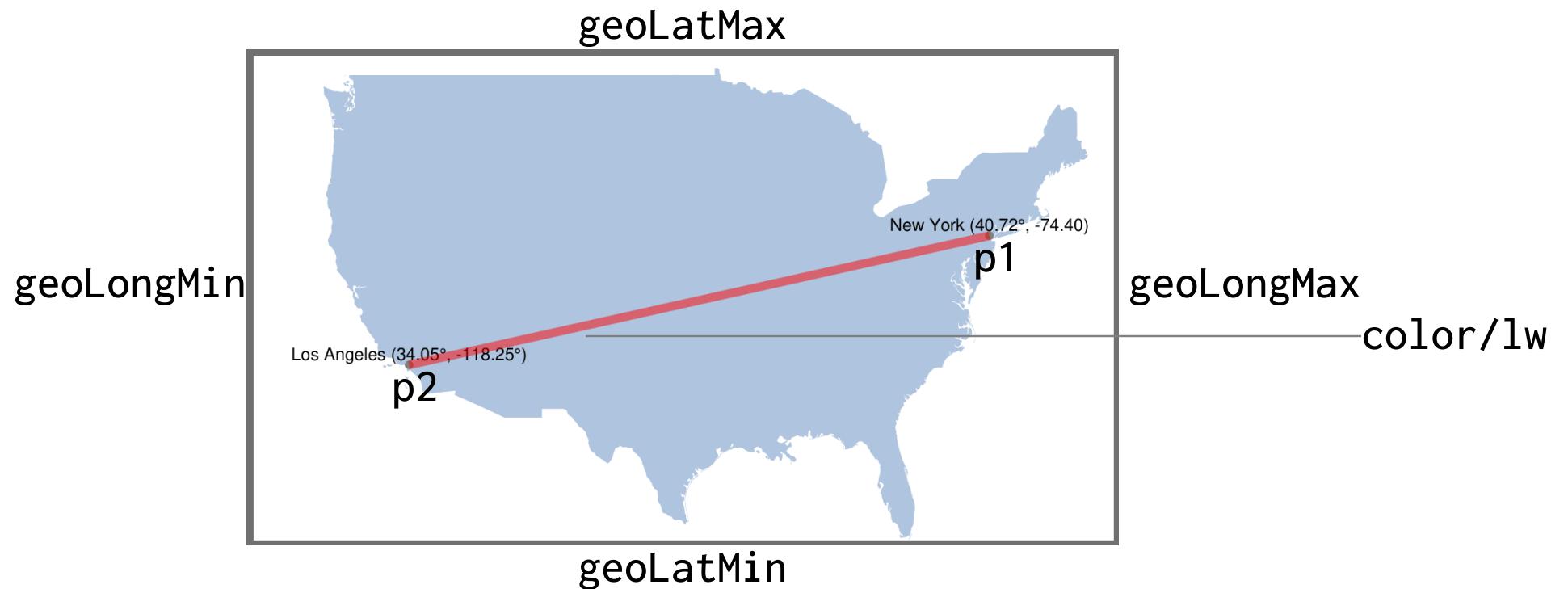
geoLongMin=0-130

geoLongMax=0-65

georegion "usa.kml" "lightsteelblue"

geoimage "geo:40,-100" usa.png" 35 0



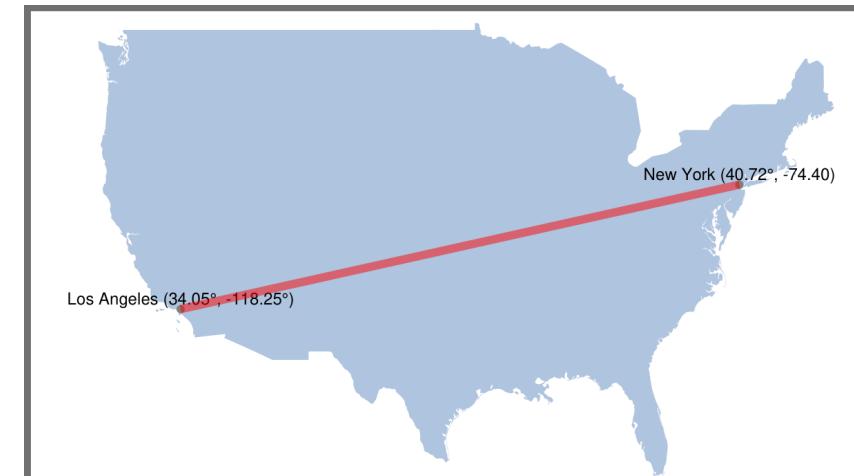


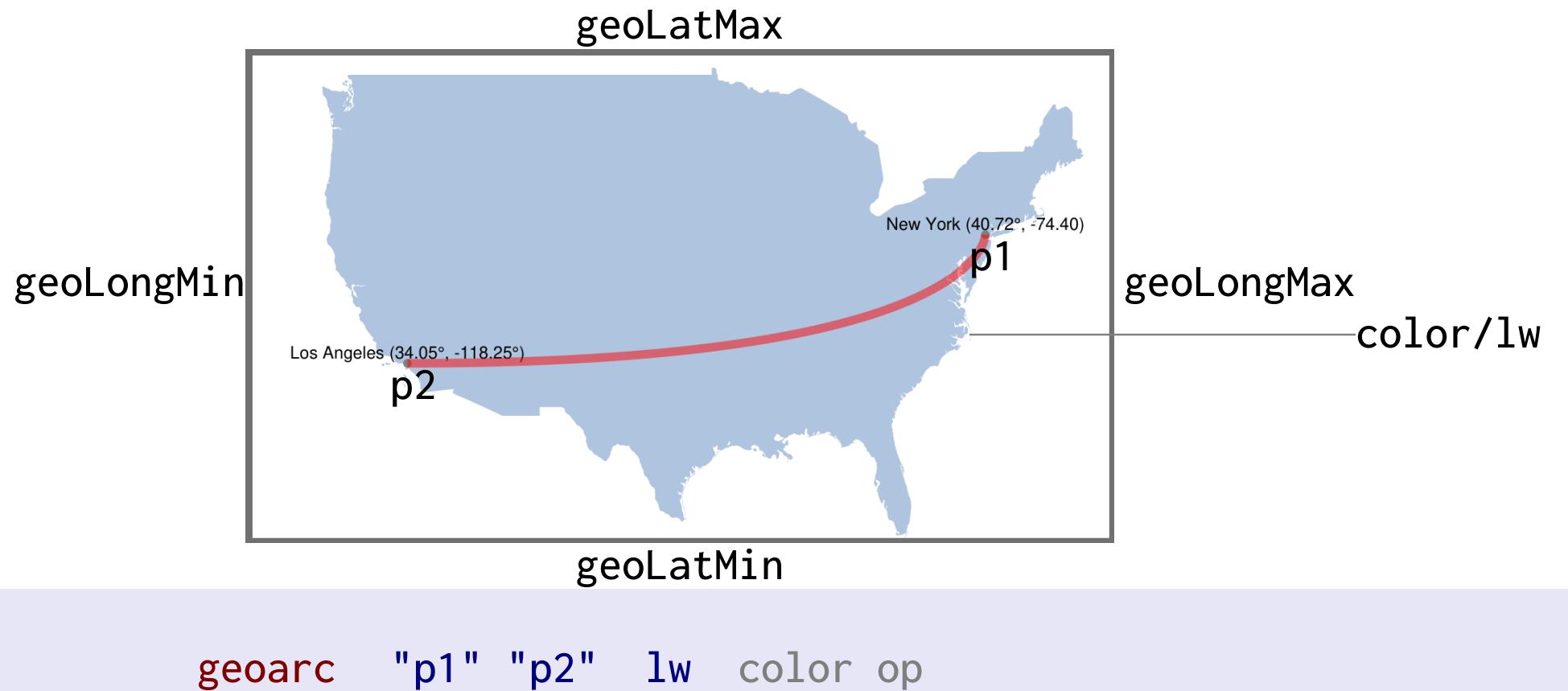
```

geoLatMin=25
geoLatMax=50
geoLongMin=0-130
geoLongMax=0-65
nyc="geo:+40.7167,-74.4000      New York (40.72°, -74.40)"
los="geo:+34.05000,-118.250     Los Angeles (34.05°, -118.25°)"

georegion "usa.kml" "lightsteelblue"
geoloc   nyc  "c" 2
geoloc   los  "c" 2
geopath   nyc los  1 "red" 50

```



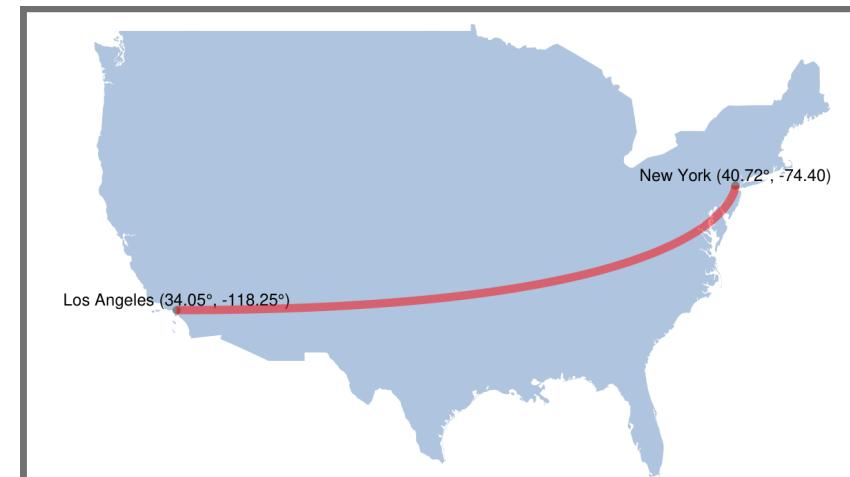


```

geoLatMin=25
geolatmax=50
geoLongMin=0-130
geoLongMax=0-65
nyc="geo:+40.7167,-74.4000      New York (40.72°, -74.40)"
los="geo:+34.05000,-118.250     Los Angeles (34.05°, -118.25°)"

georegion "usa.kml" "lightsteelblue"
geoloc    nyc "c" 2
geoloc    los "c" 2
geoarc    nyc los 1 "red" 50

```



geoLatMax

geoLongMin

geoLongMax

geoLatMin

geopathfile "file" lw color op

geoLatMin=25

geoLatMax=50

geoLongMin=0-130

geoLongMax=0-65

| | |
|---------------------------|---------------|
| geo:40.712778,-74.006111 | New York |
| geo:39.952778,-75.163611 | Philadelphia |
| geo:39.768611,-86.158056 | Indianapolis |
| geo:38.627222,-90.197778 | St. Louis |
| geo:35.468611,-97.521389 | Oklahoma City |
| geo:35.084444,-106.650278 | Albuquerque |
| geo:36.167222,-115.148611 | Las Vegas |
| geo:34.050000,-118.250000 | Los Angeles |

```
georegion "usa.kml" "lightsteelblue"
geoloc "roadtrip.d" "c" 2
geopathfile "roadtrip.d" 0.5 "red" 25
```



Keyword Reference

| Keyword | Arguments | Description |
|-----------|-----------------------|---|
| Structure | <code>deck</code> | Begin a deck; end with "edeck" |
| | <code>def</code> | Define a function; end with "edef" |
| | <code>for</code> | Begin loop; end with "efor" |
| | <code>if</code> | Conditional; one of: a==b, a!=b, a>b, a<b, a>=b, a<=b, a<>b c |
| | <code>import</code> | import function found in a file |
| | <code>include</code> | Include the contents of a file |
| | <code>slide</code> | Begin a slide; end with "eslide" |
| | <code>edeck</code> | End the deck |
| | <code>edef</code> | End the defintion |
| | <code>efor</code> | End the for loop |
| Utility | <code>eif</code> | End the conditional |
| | <code>else</code> | Begin the else clause |
| | <code>canvas</code> | Define with dimensions of the canvas |
| | <code>content</code> | Embed content |
| | <code>dump</code> | Dump variables |
| Graphics | <code>grid</code> | Define a content grid |
| | <code>ruler</code> | draw a (x,y) ruler |
| | <code>acircle</code> | Circle with sized based on area |
| | <code>arc</code> | Elliptical arc centered at (x,y), dimensions (w,h) between angles a1 and a2 |
| | <code>circle</code> | Circle centered at (x,y), diameter w |
| | <code>curve</code> | Quadratic Bezier Curve begin (bx,by), control (cx, cy), end (ex,ey) |
| | <code>ellipse</code> | Ellipse centered at (x,y), dimension (w,h) |
| | <code>hline</code> | Horizontal line begin at (x,y), length w |
| | <code>line</code> | Line between (x1,y1) and (x2,y2) |
| | <code>pill</code> | Pill shape beginning at (x,y), dimensions (w,h) |
| | <code>polygon</code> | Polygon with specified x, y coordinates |
| | <code>polyline</code> | Polyline with specified x, y coordinates |
| | <code>rect</code> | Rectangle centered at (x,y), dimensions (w,h) |
| | <code>rrect</code> | Rounded rectangle centered at (x,y), dimensions (w,h), corner radius r |
| | <code>square</code> | Square centered at (x,y), size w |
| | <code>star</code> | Star centered at (x,y), with sides, innner and outer sizes |
| | <code>vline</code> | Vertical line beginning at (x,y), h high |

| | Keyword | Arguments | Description |
|---------------------|----------------------------|--|---|
| Text | <code>arctext</code> | "string" x y radius a1 a2 fontsize [font] [color] [opacity] [link] | Text on an arc, at fontsize, center (x,y), radius r, between a1. a2 |
| | <code>btext</code> | "string" x y fontsize [font] [color] [opacity] [link] | Text beginning at (x,y), at fontsize |
| | <code>ctext</code> | "string" x y fontsize [font] [color] [opacity] [link] | Centered text beginning at (x,y), at fontsize |
| | <code>etext</code> | "string" x y fontsize [font] [color] [opacity] [link] | End-aligned text at (x,y), at fontsize |
| | <code>rtext</code> | "string" x y angle fontsize [font] [color] [opacity] [link] | Rotated text centered at (x,y), at angle and fontsize |
| | <code>text</code> | "string" x y fontsize [font] [color] [opacity] [link] | Text beginning at (x,y), at fontsize |
| | <code>textblock</code> | "string" x y w fontsize [font] [color] [opacity] [link] | Block of text beginning at (x,y), at fontsize, with width w |
| | <code>textblockfile</code> | "file" x y w fontsize [font] [color] [opacity] [link] | Block of text read for a file, beginning at (x,y), at fontsize, with width w |
| | <code>textcode</code> | "file" x y w fontsize [font] [color] [opacity] | Lines of code, read from a file, upper right corner at (x,y), margin at w |
| | <code>textfile</code> | "file" x y fontsize [font] [color] [opacity] [spacing] | Contents of a text file pper right corner at (x,y) |
| Lists | <code>blist</code> | x y fontsize [font] [color] [opacity] [spacing] | Bulleted list starting at (x,y), at fontsize |
| | <code>clist</code> | x y fontsize [font] [color] [opacity] [spacing] | Centered list starting at (x,y), at fontsize |
| | <code>list</code> | x y fontsize [font] [color] [opacity] [spacing] | List starting at (x,y), at fontsize |
| | <code>nlist</code> | x y fontsize [font] [color] [opacity] [spacing] | Numbered list starting at (x,y), at fontsize |
| | <code>li</code> | "item" [font] [color] [opacity] | List item |
| | <code>elist</code> | | End the list |
| Images | <code>cimage</code> | "file" "caption" x y w h [scale] [link] capsiz | Captioned image; center (x,y), dimensions (w,h) (h=0, w is % of canvas width) |
| | <code>image</code> | "file" x y w h [scale] [link] | Image center at (x,y), dimensions (w,h) (h=0, w is % of canvas width) |
| Braces/ Brackets | <code>dbrace</code> | x y w bw bh [lw] [color] [opacity] | Downward pointing brace |
| | <code>dbracket</code> | x y w h [lw] [color] [opacity] | Downward pointing bracket |
| | <code>lbrace</code> | x y h bw bh [lw] [color] [opacity] | Left pointing brace |
| | <code>lbracket</code> | x y w h [lw] [color] [opacity] | Left pointing bracket |
| | <code>rbrace</code> | x y h bw bh [lw] [color] [opacity] | Right pointing brace |
| | <code>rbracket</code> | x y w h [lw] [color] [opacity] | Right pointing bracket |
| | <code>ubrace</code> | x y w bw bh [lw] [color] [opacity] | Upward facing brace |
| | <code>ubracket</code> | x y w h [lw] [color] [opacity] | Upward facing bracket |

| | Keyword | Arguments | Description |
|------------|--------------------------|---|--|
| Arrows | <code>arrow</code> | <code>x1 y1 x2 y2 [lw] [aw] [ah] [color] [opacity]</code> | Arrow starting at (x1,y1), ending at (x2,y2), aw=width, ah=height |
| | <code>darrow</code> | <code>bx by bx xy ex ey [lw] [aw] [ah] [color] [opacity]</code> | Downward curved arrow; curve specified by (bx,by), (cx,cy), (ex,ey) |
| | <code>larrow</code> | <code>bx by bx xy ex ey [lw] [aw] [ah] [color] [opacity]</code> | Left curved arrow; curve specified by (bx,by), (cx,cy), (ex,ey) |
| | <code>rarrow</code> | <code>bx by bx xy ex ey [lw] [aw] [ah] [color] [opacity]</code> | Right curved arrow; curve specified by (bx,by), (cx,cy), (ex,ey) |
| | <code>uarrow</code> | <code>bx by bx xy ex ey [lw] [aw] [ah] [color] [opacity]</code> | Upward curved arrow; curve specified by (bx,by), (cx,cy), (ex,ey) |
| Charts | <code>dchart</code> | options... | Chart with specified options |
| | <code>legend</code> | "string" x y fontsize font color | Chart legend |
| Built-ins | <code>x=area</code> | expression | Assign an area |
| | <code>x=format</code> | "fmt" expr... (up to 5) | Assign formatting to expressions |
| | <code>x=polar</code> | x y radius angle | Assign polar coordinate centered at (x,y) at radius and angle (0-360) |
| | <code>x=polarx</code> | x y radius angle | Assign X-polar coordinate centered at (x,y) at radius and angle (0-360) |
| | <code>x=poly</code> | x y radius angle | Assign Y-polar coordinate centered at (x,y) at radius and angle (0-360) |
| | <code>x=random</code> | min max | Assign a random number between two values |
| | <code>x=substr</code> | "string" begin end | Assign a substring |
| | <code>x=vmap</code> | data min1 max1 min2 max2 | Assign a value mapped to two ranges |
| Math | <code>x=cosine</code> | expression | Assign the cosine of expression |
| | <code>x=sine</code> | expression | Assign the sine of expression |
| | <code>x=sqrt</code> | expression | Assign the square root of expression |
| | <code>x=tangent</code> | expression | Assign the tangent of expression |
| | <code>geoarc</code> | "p1" "p2" [lw] [color] [opacity] | Draw arcs between points |
| Geographic | <code>geoborder</code> | "file" [lw] [color] [opacity] | Reads KML data from the specified file and renders the map borders |
| | <code>geoimage</code> | "loc" width height | Place an image at a geographical location |
| | <code>geolabel</code> | "loc" [size] [font] [color] [opacity] | Reads data from the specified file or location and renders the map labels |
| | <code>geoloc</code> | "loc" [align] [size] [font] [color] [opacity] | Reads data from the specified file or location and a make map point and labels |
| | <code>geomark</code> | "loc" [size] [color] [opacity] | Reads data from the specified file or location and renders map points |
| | <code>geopath</code> | "p1" "p2" [lw] [color] [opacity] | Draw line between points |
| | <code>geopathfile</code> | "file" [lw] [color] [opacity] | Reads data from the specified file and a make lines between points |
| | <code>georegion</code> | "file" [color] [opacity] | Reads KML data from the specified file and renders the map regions |