

# decksh reference



# *Keywords*

## Structure Text

deck  
edeck  
slide  
eslide  
canvas  
include  
grid  
text  
ctext  
etext  
rtext  
arctext  
textblock  
textfile  
textcode

## Lists

list  
blist  
nlist  
clist  
li  
elist

## Graphics

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

## Braces Arrows

lbrace  
rbrace  
ubrace  
dbrace  
arrow  
carrow  
clarrow  
cuarrow  
cdarrow

## Images

image  
cimage

## Charts

dchart  
legend

## Loop

for  
efor

## Assignments

polarx  
polary  
area  
format  
random  
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"

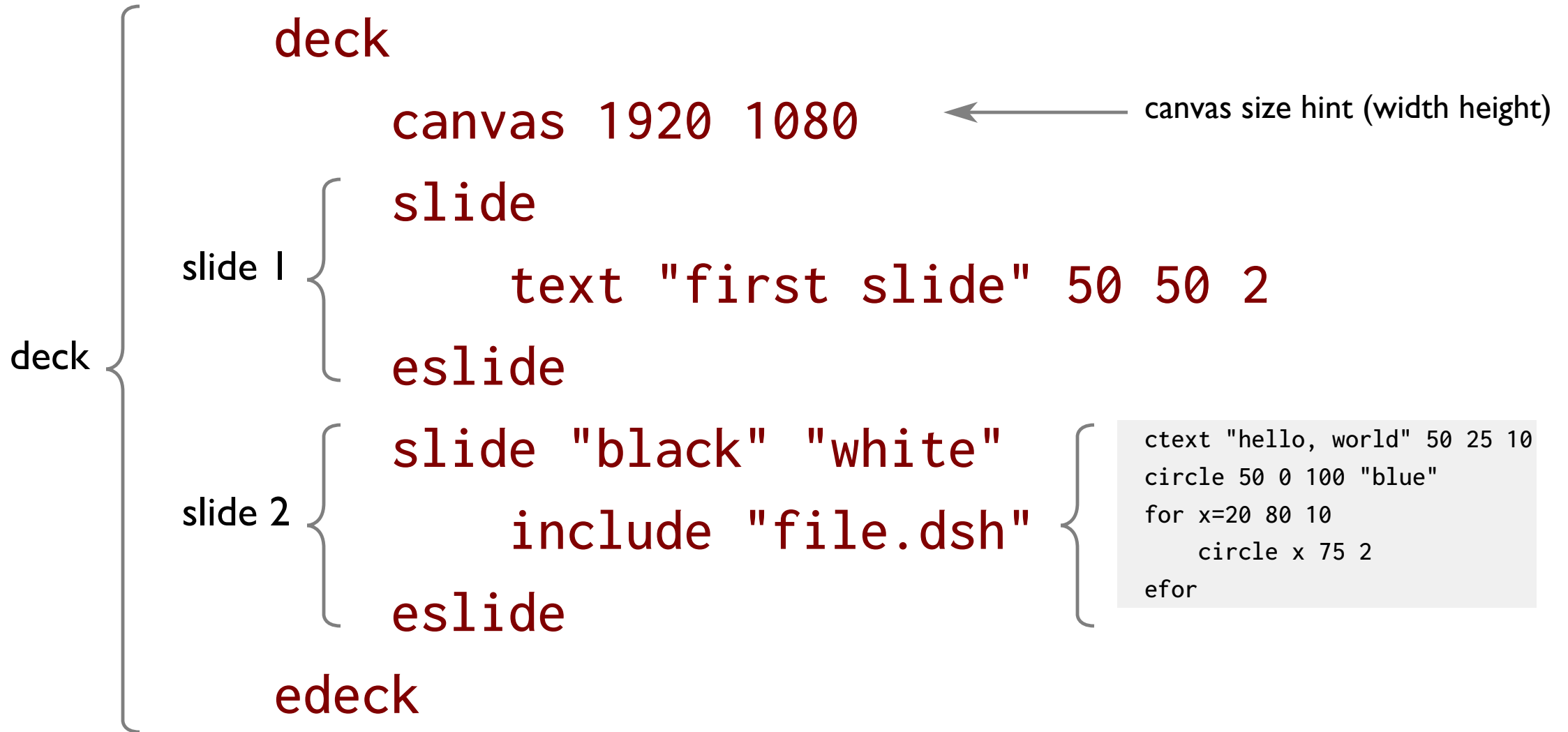
*hello, world*

text "hello, world" 80 20 2

"serif" "red" 50

*hello, world*




# Structure



# Percent Grid



# 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              | Name                 | Hex     | RGB              | Name              | Hex     | RGB              | Name        | Hex     | RGB              |
|----------------|---------|------------------|----------------------|---------|------------------|-------------------|---------|------------------|-------------|---------|------------------|
| aliceblue      | #f0f8ff | rgb(240,248,255) | deeppink             | #ff1493 | rgb(255,20,147)  | lightsteelblue    | #b0c4de | rgb(176,196,222) | rosybrown   | #bc8f8f | rgb(188,143,143) |
| antiquewhite   | #faebd7 | rgb(250,235,215) | deepskyblue          | #00bfff | rgb(0,191,255)   | lightyellow       | #ffffe0 | rgb(255,255,224) | royalblue   | #4169e1 | rgb(65,105,225)  |
| aqua           | #00ffff | rgb(0,255,255)   | dimgray              | #696969 | rgb(105,105,105) | lime              | #00ff00 | rgb(0,255,0)     | saddlebrown | #8b4513 | rgb(139,69,19)   |
| aquamarine     | #7fffd4 | rgb(127,255,212) | dimgrey              | #696969 | rgb(105,105,105) | limegreen         | #32cd32 | rgb(50,205,50)   | salmon      | #fa8072 | rgb(250,128,114) |
| azure          | #f0ffff | rgb(240,255,255) | dodgerblue           | #1e90ff | rgb(30,144,255)  | linen             | #faf0e6 | rgb(250,240,230) | sandybrown  | #f4a460 | rgb(244,164,96)  |
| beige          | #f5f5dc | rgb(245,245,220) | firebrick            | #b22222 | rgb(178,34,34)   | magenta           | #ff00ff | rgb(255,0,255)   | seagreen    | #2e8b57 | rgb(46,139,87)   |
| bisque         | #ffe4c4 | rgb(255,228,196) | floralwhite          | #fffaf0 | rgb(255,250,240) | maroon            | #800000 | rgb(128,0,0)     | seashell    | #fff5ee | rgb(255,245,238) |
| black          | #000000 | rgb(0,0,0)       | forestgreen          | #228b22 | rgb(34,139,34)   | mediumaquamarine  | #66cdaa | rgb(102,205,170) | sienna      | #a0522d | rgb(160,82,45)   |
| blanchedalmond | #ffebcd | rgb(255,235,205) | fuchsia              | #ff00ff | rgb(255,0,255)   | mediumblue        | #0000cd | rgb(0,0,205)     | silver      | #c0c0c0 | rgb(192,192,192) |
| blue           | #0000ff | rgb(0,0,255)     | gainsboro            | #dcdcdc | rgb(220,220,220) | mediumorchid      | #ba55d3 | rgb(186,85,211)  | skyblue     | #87ceeb | rgb(135,206,235) |
| blueviolet     | #8a2be2 | rgb(138,43,226)  | ghostwhite           | #f8f8ff | rgb(248,248,255) | mediumpurple      | #9370db | rgb(147,112,219) | slateblue   | #6a5acd | rgb(106,90,205)  |
| brown          | #a52a2a | rgb(165,42,42)   | gold                 | #ffd700 | rgb(255,215,0)   | mediumseagreen    | #3cb371 | rgb(60,179,113)  | slategray   | #708090 | rgb(112,128,144) |
| burlywood      | #deb887 | rgb(222,184,135) | goldenrod            | #daa520 | rgb(218,165,32)  | mediumslateblue   | #7b68ee | rgb(123,104,238) | slategrey   | #708090 | rgb(112,128,144) |
| cadetblue      | #5f9ea0 | rgb(95,158,160)  | gray                 | #808080 | rgb(128,128,128) | mediumspringgreen | #00fa9a | rgb(0,250,154)   | snow        | #fffafa | rgb(255,250,250) |
| chartreuse     | #7fff00 | rgb(127,255,0)   | green                | #008000 | rgb(0,128,0)     | mediumturquoise   | #48d1cc | rgb(72,209,204)  | springgreen | #00ff7f | rgb(0,255,127)   |
| chocolate      | #d2691e | rgb(210,105,30)  | greenyellow          | #adff2f | rgb(173,255,47)  | mediumvioletred   | #c71585 | rgb(199,21,133)  | steelblue   | #4682b4 | rgb(70,130,180)  |
| coral          | #ff7f50 | rgb(255,127,80)  | grey                 | #808080 | rgb(128,128,128) | midnightblue      | #191970 | rgb(25,25,112)   | tan         | #d2b48c | rgb(210,180,140) |
| cornflowerblue | #6495ed | rgb(100,149,237) | honeydew             | #f0fff0 | rgb(240,255,240) | mintcream         | #f5fffa | rgb(245,255,250) | teal        | #008080 | rgb(0,128,128)   |
| cornsilk       | #fff8dc | rgb(255,248,220) | hotpink              | #ff69b4 | rgb(255,105,180) | mistyrose         | #ffe4e1 | rgb(255,228,225) | thistle     | #d8bfd8 | rgb(216,191,216) |
| crimson        | #dc143c | rgb(220,20,60)   | indianred            | #cd5c5c | rgb(205,92,92)   | moccasin          | #ffe4b5 | rgb(255,228,181) | tomato      | #ff6347 | rgb(255,99,71)   |
| cyan           | #00ffff | rgb(0,255,255)   | indigo               | #4b0082 | rgb(75,0,130)    | navajowhite       | #ffdead | rgb(255,222,173) | turquoise   | #40e0d0 | rgb(64,224,208)  |
| darkblue       | #00008b | rgb(0,0,139)     | ivory                | #fffff0 | rgb(255,255,240) | navy              | #000080 | rgb(0,0,128)     | violet      | #ee82ee | rgb(238,130,238) |
| darkcyan       | #008b8b | rgb(0,139,139)   | khaki                | #f0e68c | rgb(240,230,140) | oldlace           | #fdf5e6 | rgb(253,245,230) | wheat       | #f5deb3 | rgb(245,222,179) |
| darkgoldenrod  | #b8860b | rgb(184,134,11)  | lavender             | #e6e6fa | rgb(230,230,250) | olive             | #808000 | rgb(128,128,0)   | white       | #ffffff | rgb(255,255,255) |
| darkgray       | #a9a9a9 | rgb(169,169,169) | lavenderblush        | #fff0f5 | rgb(255,240,245) | olivedrab         | #6b8e23 | rgb(107,142,35)  | whitesmoke  | #f5f5f5 | rgb(245,245,245) |
| darkgreen      | #006400 | rgb(0,100,0)     | lawngreen            | #7cfc00 | rgb(124,252,0)   | orange            | #ffa500 | rgb(255,165,0)   | yellow      | #ffff00 | rgb(255,255,0)   |
| darkgrey       | #a9a9a9 | rgb(169,169,169) | lemonchiffon         | #fffacd | rgb(255,250,205) | orangered         | #ff4500 | rgb(255,69,0)    | yellowgreen | #9acd32 | rgb(154,205,50)  |
| darkkhaki      | #bdb76b | rgb(189,183,107) | lightblue            | #add8e6 | rgb(173,216,230) | orchid            | #da70d6 | rgb(218,112,214) |             |         |                  |
| darkmagenta    | #8b008b | rgb(139,0,139)   | lightcoral           | #f08080 | rgb(240,128,128) | palegoldenrod     | #eee8aa | rgb(238,232,170) |             |         |                  |
| darkolivegreen | #556b2f | rgb(85,107,47)   | lightcyan            | #e0ffff | rgb(224,255,255) | palegreen         | #98fb98 | rgb(152,251,152) |             |         |                  |
| darkorange     | #ff8c00 | rgb(255,140,0)   | lightgoldenrodyellow | #fafad2 | rgb(250,250,210) | paleturquoise     | #afeeee | rgb(175,238,238) |             |         |                  |
| darkorchid     | #9932cc | rgb(153,50,204)  | lightgray            | #d3d3d3 | rgb(211,211,211) | palevioletred     | #db7093 | rgb(219,112,147) |             |         |                  |
| darkred        | #8b0000 | rgb(139,0,0)     | lightgreen           | #90ee90 | rgb(144,238,144) | papayawhip        | #ffefd5 | rgb(255,239,213) |             |         |                  |
| darksalmon     | #e9967a | rgb(233,150,122) | lightgrey            | #d3d3d3 | rgb(211,211,211) | peachpuff         | #ffdab9 | rgb(255,218,185) |             |         |                  |
| darkseagreen   | #8fbc8f | rgb(143,188,143) | lightpink            | #ffb6c1 | rgb(255,182,193) | peru              | #cd853f | rgb(205,133,63)  |             |         |                  |
| darkslateblue  | #483d8b | rgb(72,61,139)   | lightsalmon          | #ffa07a | rgb(255,160,122) | pink              | #ffc0cb | rgb(255,192,203) |             |         |                  |
| darkslategray  | #2f4f4f | rgb(47,79,79)    | lightseagreen        | #20b2aa | rgb(32,178,170)  | plum              | #dda0dd | rgb(221,160,221) |             |         |                  |
| darksategrey   | #2f4f4f | rgb(47,79,79)    | lightskyblue         | #87cefa | rgb(135,206,250) | powderblue        | #b0e0e6 | rgb(176,224,230) |             |         |                  |
| darkturquoise  | #00ced1 | rgb(0,206,209)   | lightslategray       | #778899 | rgb(119,136,153) | purple            | #800080 | rgb(128,0,128)   |             |         |                  |
| darkviolet     | #9400d3 | rgb(148,0,211)   | lightsategrey        | #778899 | rgb(119,136,153) | red               | #ff0000 | rgb(255,0,0)     |             |         |                  |

# Object Index

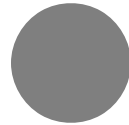
Text

hello, world

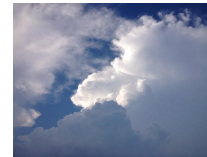
The quick brown  
fox jumped over  
the lazy dog

*what's up, Doc?*

Graphics



Images



sky

Lists

- First
- Second
- Third

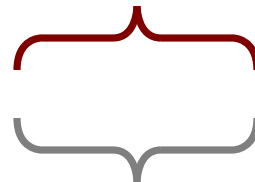
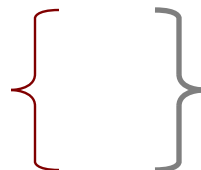
1. First
2. Second
3. Third

- First  
Second  
Third

Arrows



Braces





# *Textual Elements*

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

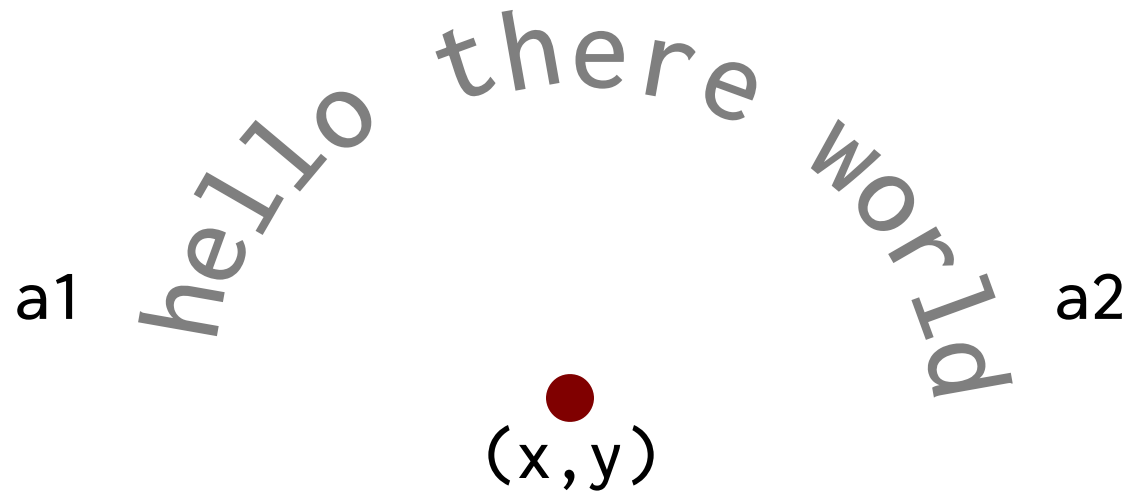
ctext 20 20 30 3

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

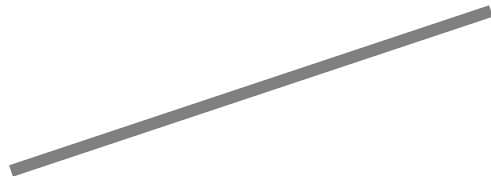
| description       | keyword        | mandatory                 | optional    |
|-------------------|----------------|---------------------------|-------------|
| Line              | <b>line</b>    | x1 y1 x2 y2 lw            | color op    |
| Horizontal line   | <b>hline</b>   | x y w             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

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

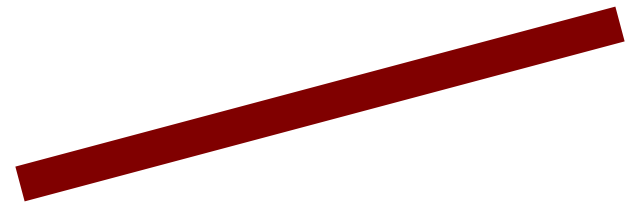
`line x1 y1 x2 y2 lw color op`



`line 10 20 30 20`



`line 40 20 60 30 0.5`



`line 70 20 95 30 1.5 "maroon"`



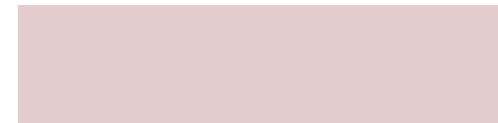
```
hline x y w lw color op
```



```
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`



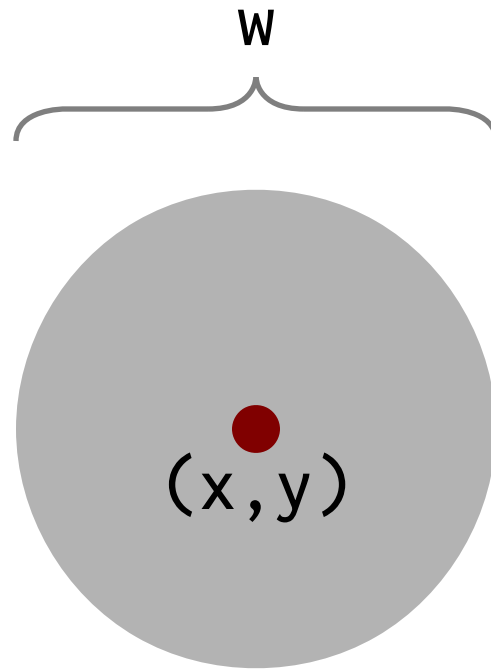
`curve 15 20 25 30 30 25`



`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`

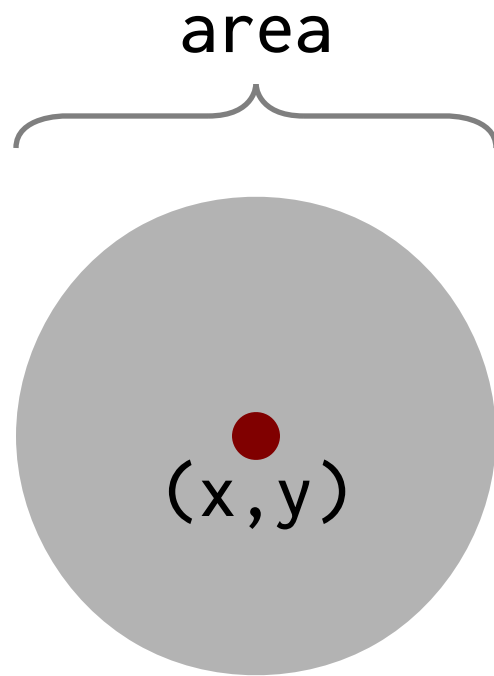


`circle 50 20 10 "maroon"`



`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`



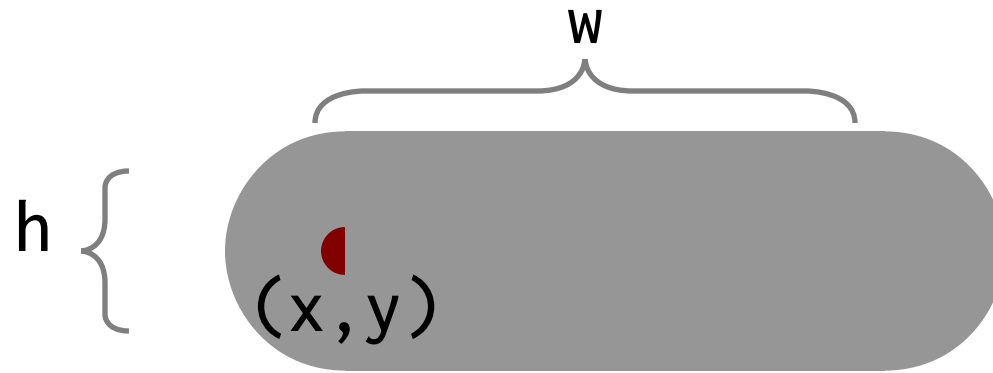
`rrect x y w h radius color op`



`rrect 20 20 10 5 1`



`rrect 80 20 5 10 1 "maroon"`



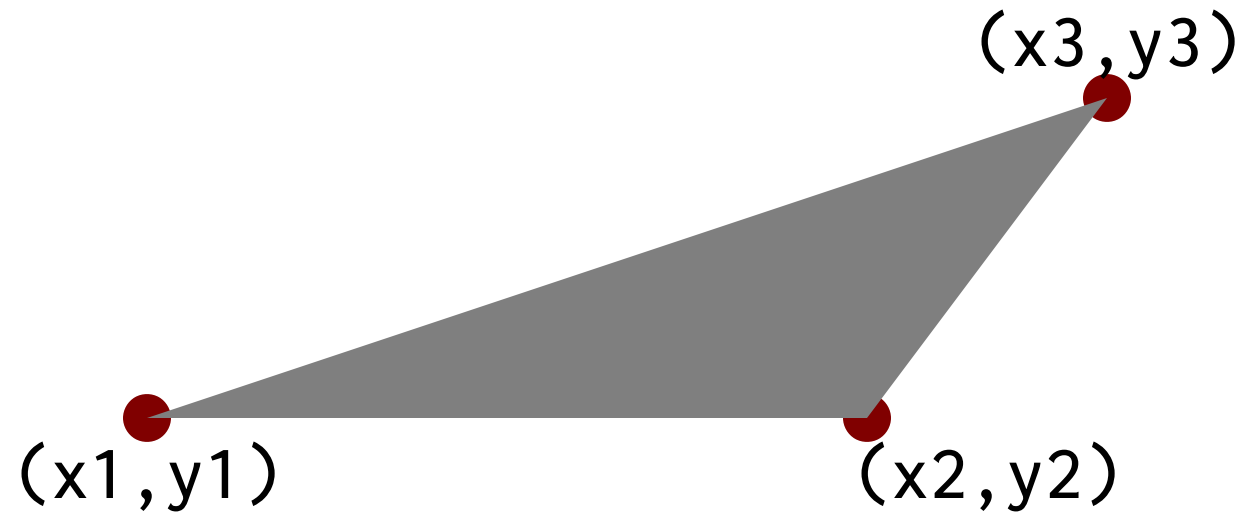
`pill x y w h color`



`pill 20 20 10 5`



`pill 80 20 5 10 "maroon"`



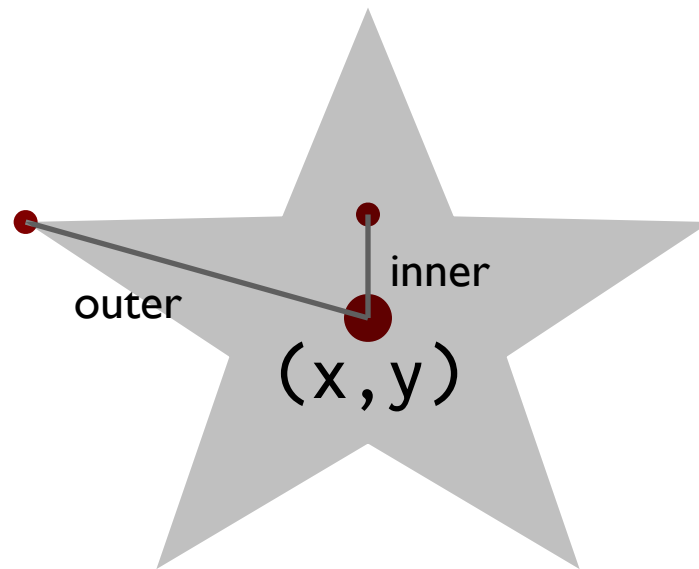
`polygon x1 x2...xn" "y1 y2...yn color op`



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



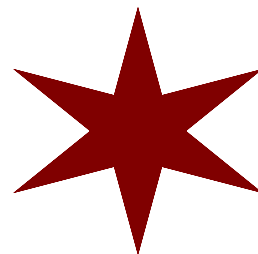
`polygon "70 85 90" "20 30 20" "maroon"`



`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

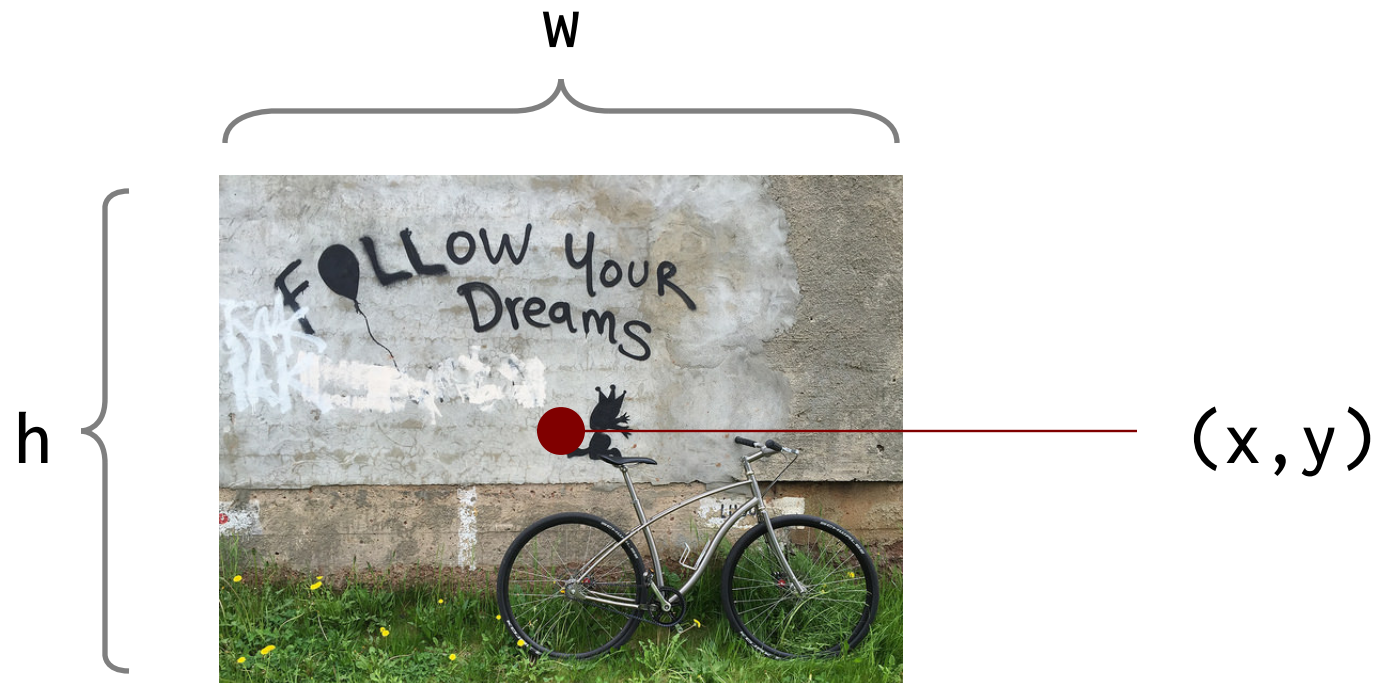


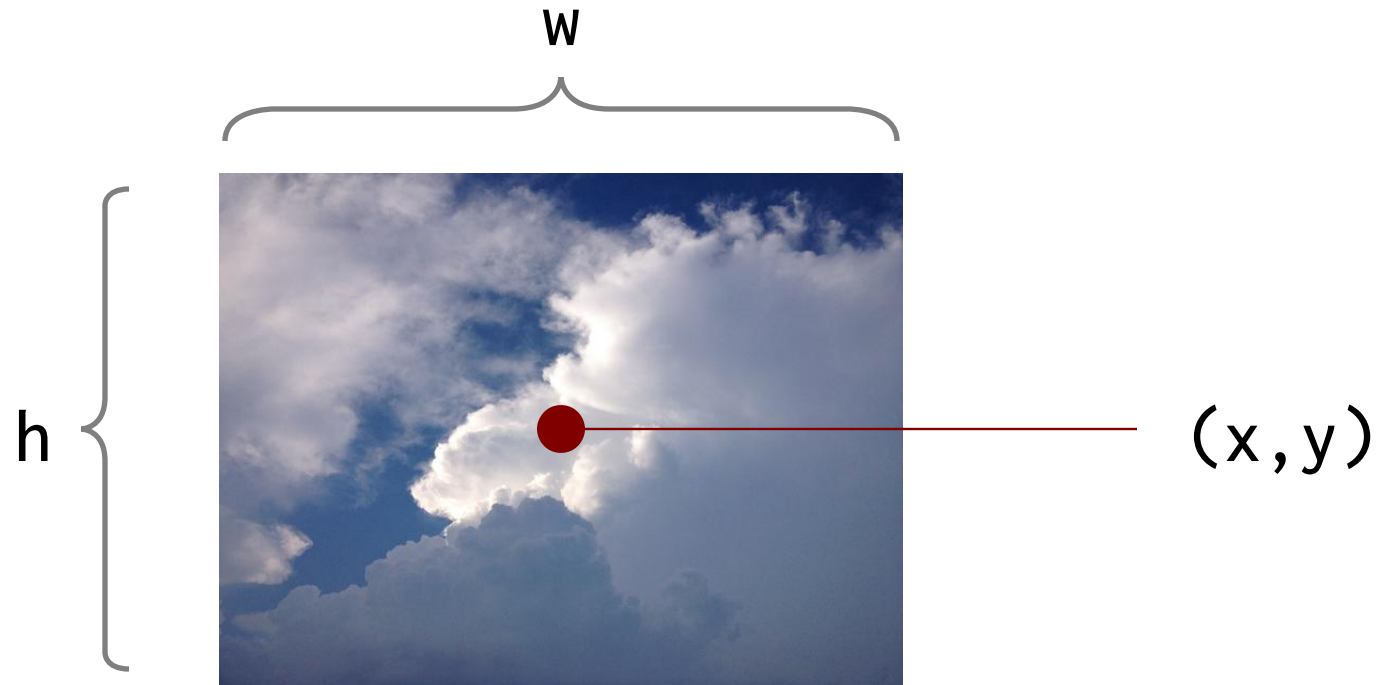
image x y w h scale link



image "follow.jpg" 20 25 640 480 10

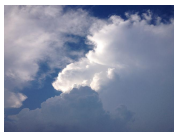


image "follow.jpg" 75 25 640 480 30



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 1. one
      li "one"
      li "two" 2. two
      li "three" 3. three
elist
```

```
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

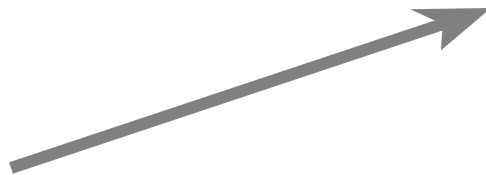
| description  | keyword              | mandatory                      | optional                       |
|--------------|----------------------|--------------------------------|--------------------------------|
| Straight     | <code>arrow</code>   | <code>x1 y1 x2 y2</code>       | <code>lw aw ah color 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> |



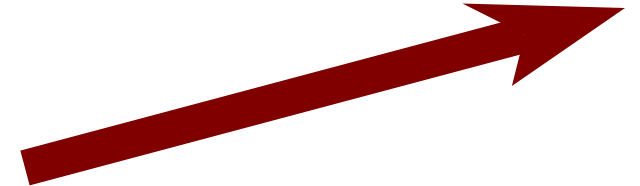
`arrow` `x1` `y1` `x2` `y2` `lw` `aw` `ah` `color` `op`



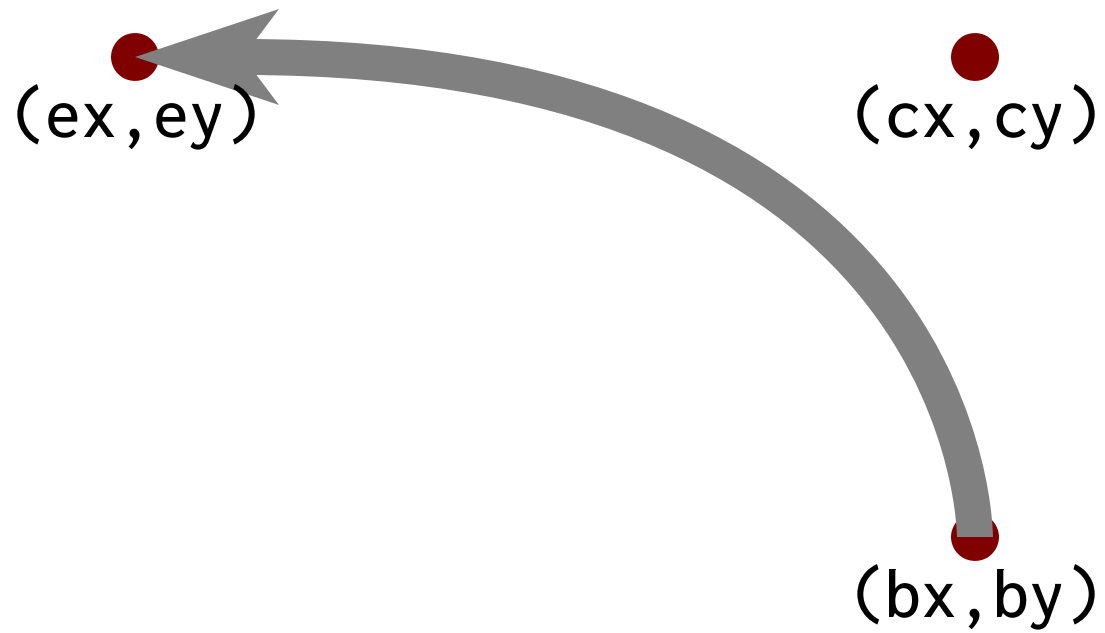
`arrow 10 20 30 20`



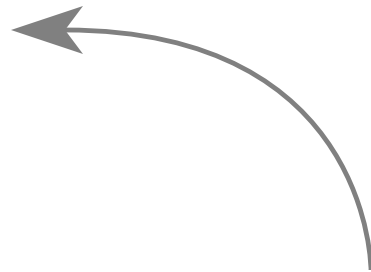
`arrow 40 20 60 30 0.5`



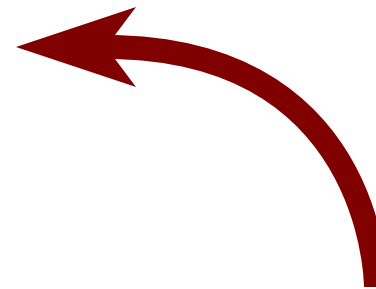
`arrow 70 20 95 30 1.5 6 6 "maroon"`



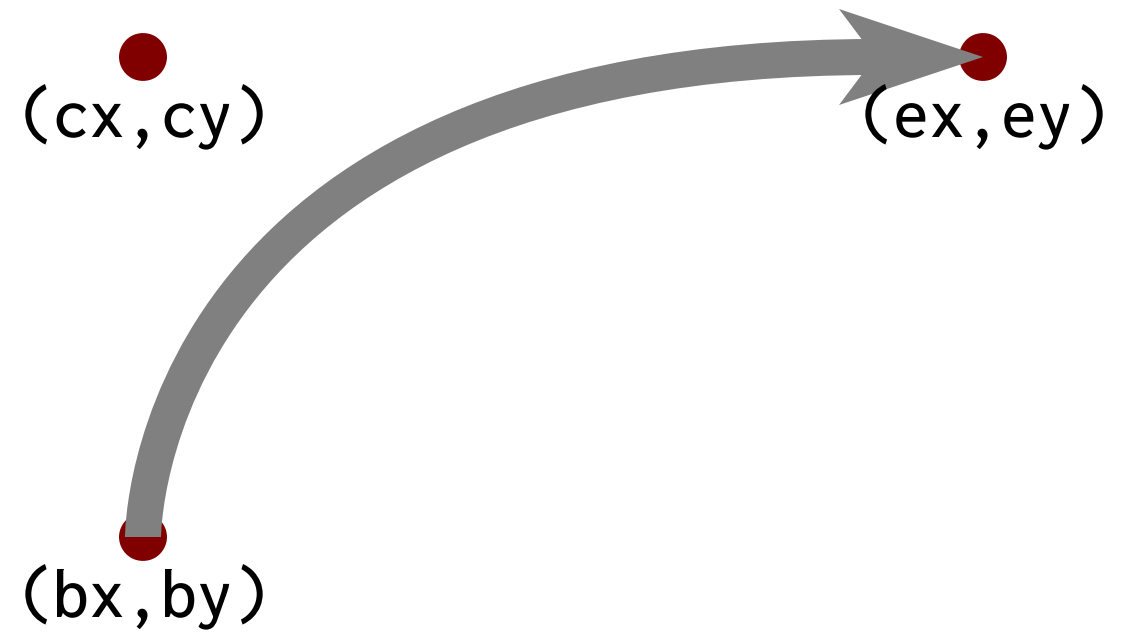
`lcarrow` `bx by cx cy ex ey lw aw ah color op`



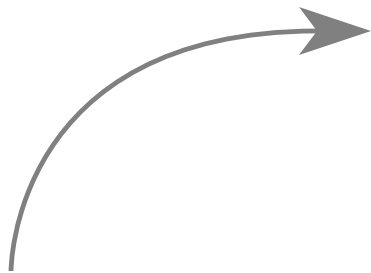
`lcarrow 30 20 30 35 15 35`



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



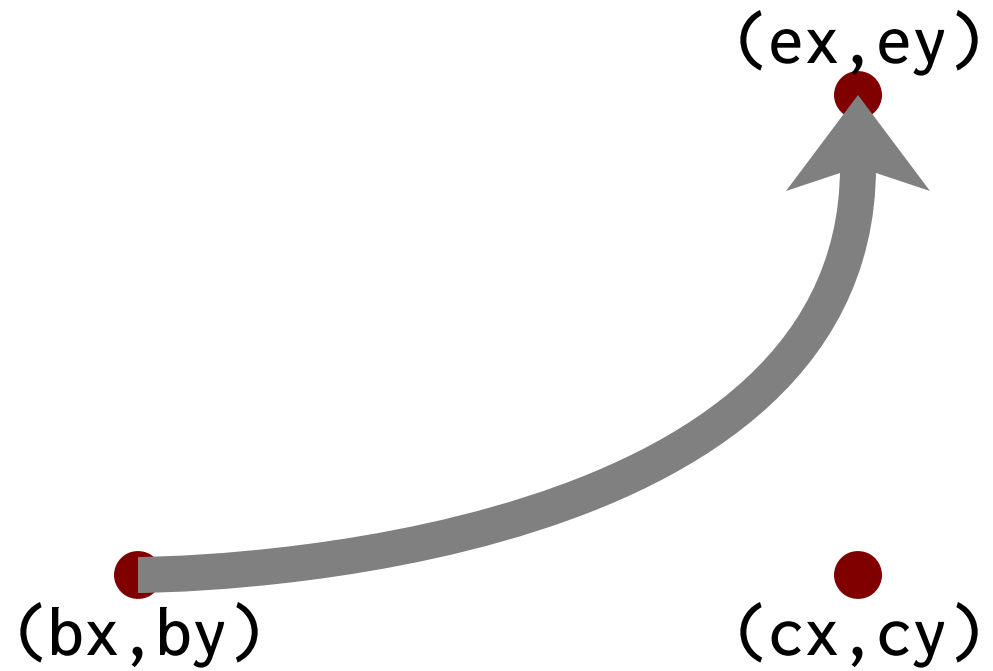
`rcarrow bx by cx cy ex ey lw aw ah color op`



`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`



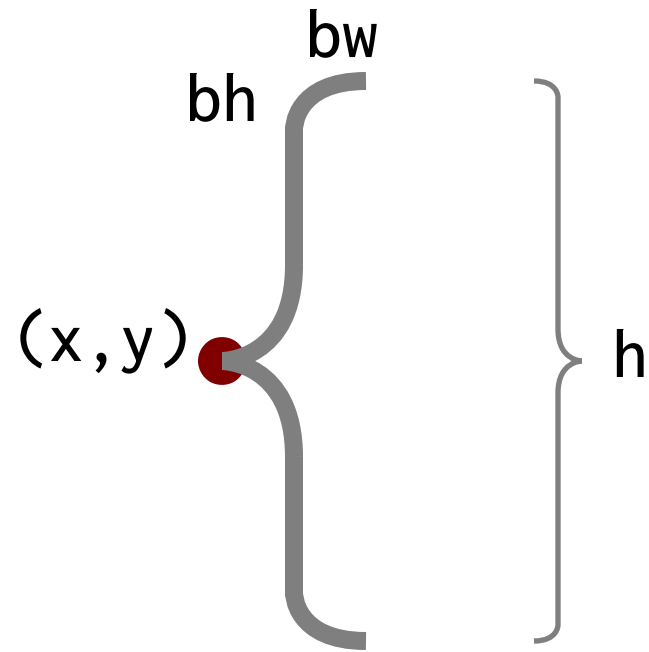
`dcarrow 15 35 30 30 20`



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

# *Braces*

| description | keyword       | mandatory          | optional    |
|-------------|---------------|--------------------|-------------|
| Left brace  | <b>lbrace</b> | x y fontsize bw bh | lw color op |
| Right brace | <b>rbrace</b> | x y fontsize bw bh | lw color op |
| Up brace    | <b>ubrace</b> | x y fontsize bw bh | lw color op |
| Down brace  | <b>dbrace</b> | x y fontsize bw bh | lw color op |



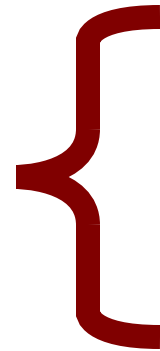
`lbrace`  $x$   $y$   $fontsize$   $bw$   $bh$   $lw$   $color$   $op$



`lbrace 20 25 20 2 2`

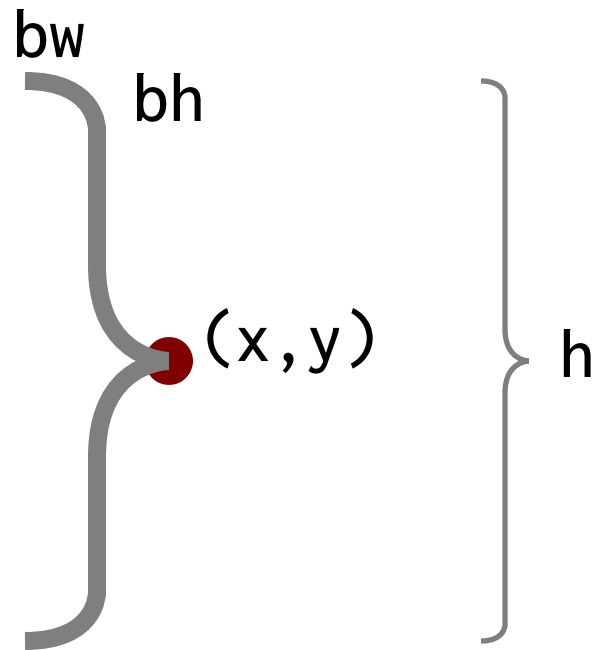


`lbrace 50 25 20 4 4 1`



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





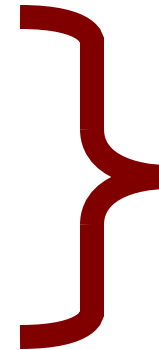
`rbrace` *x y fontsize bw bh lw color op*



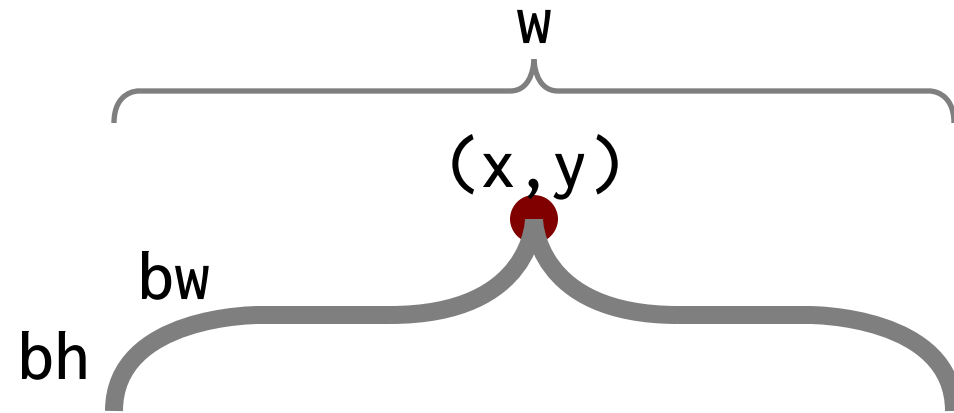
`rbrace 20 25 20 2 2`



`rbrace 50 25 20 4 4 1`



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



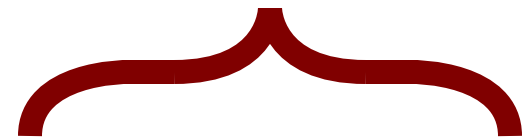
`ubrace x y fontsize bw bh lw color op`



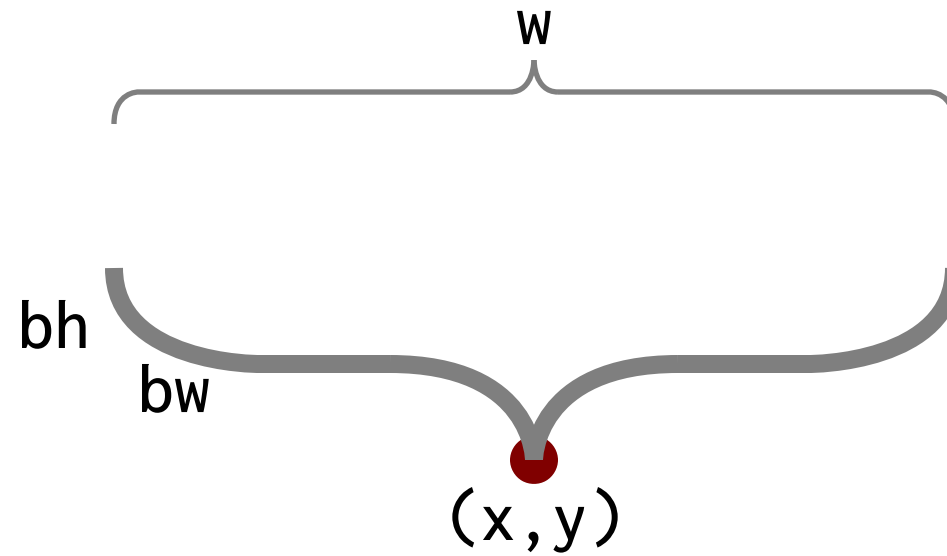
`ubrace 20 25 20 2 2`



`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"`

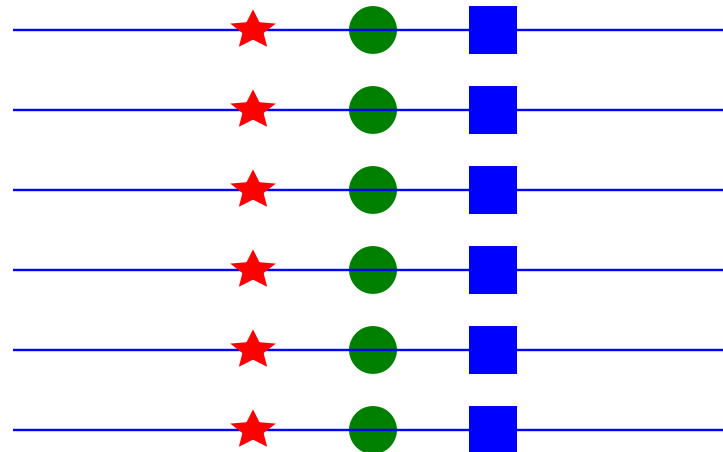
# *Loop, Assignments, Data and Grid*

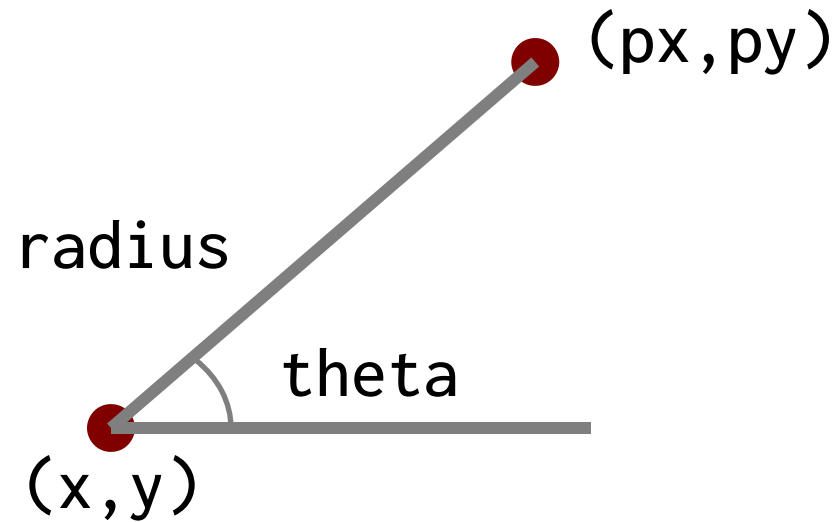
| description          | keyword                   | mandatory                                       |
|----------------------|---------------------------|---|
| Loop                 | <code>for v=</code>       | <code>begin end [increment] ... efor</code>     |
| Polar coordinate (x) | <code>x=polarx</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>                            |
| Value mapping        | <code>value=vmap</code>   | <code>data min1 max1 min2 max2</code>           |
| In-line data         | <code>data</code>         | <code>"file" ... edata</code>                   |
| Objects on a grid    | <code>grid</code>         | <code>grid "file" x y hspace vspace edge</code> |

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

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

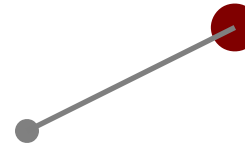
```
for v=10 35 5  
  hline 50 v 30 0.1 "blue"  
  star 60 v 5 1 0.4 "red"  
  circle 65 v 2 "green"  
  square 70 v 2 "blue"  
efor
```





```
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
```

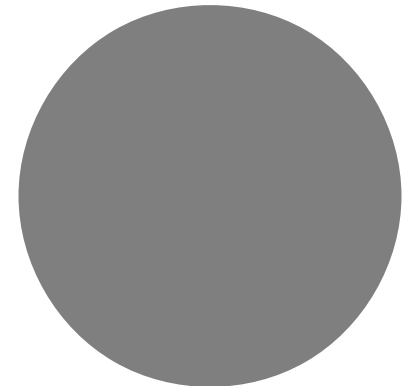
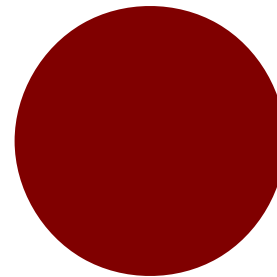
```
m2=200
```

```
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

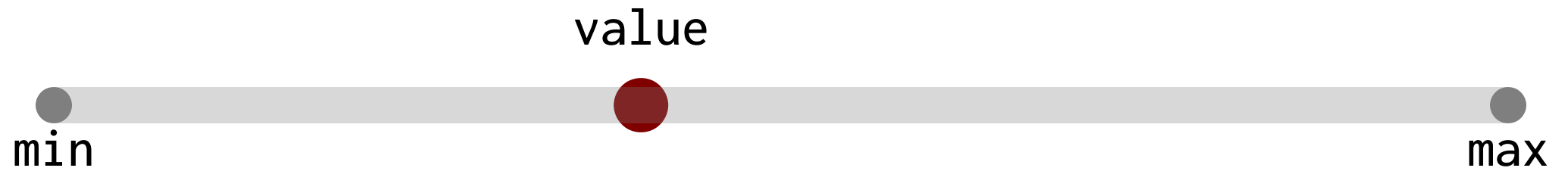
ctext title    80 30 4 "sans" "maroon"

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"
```



`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"
```



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

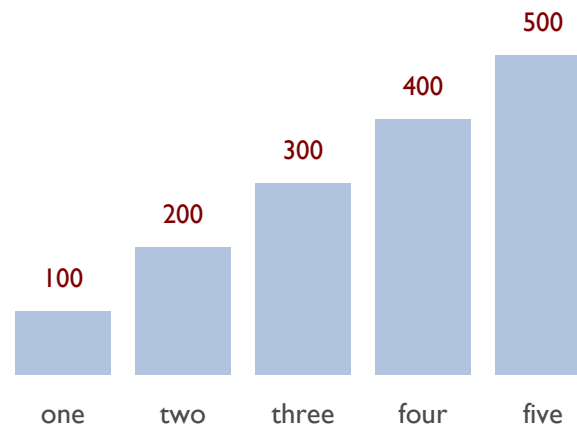
} data values

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

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

```
edata
```

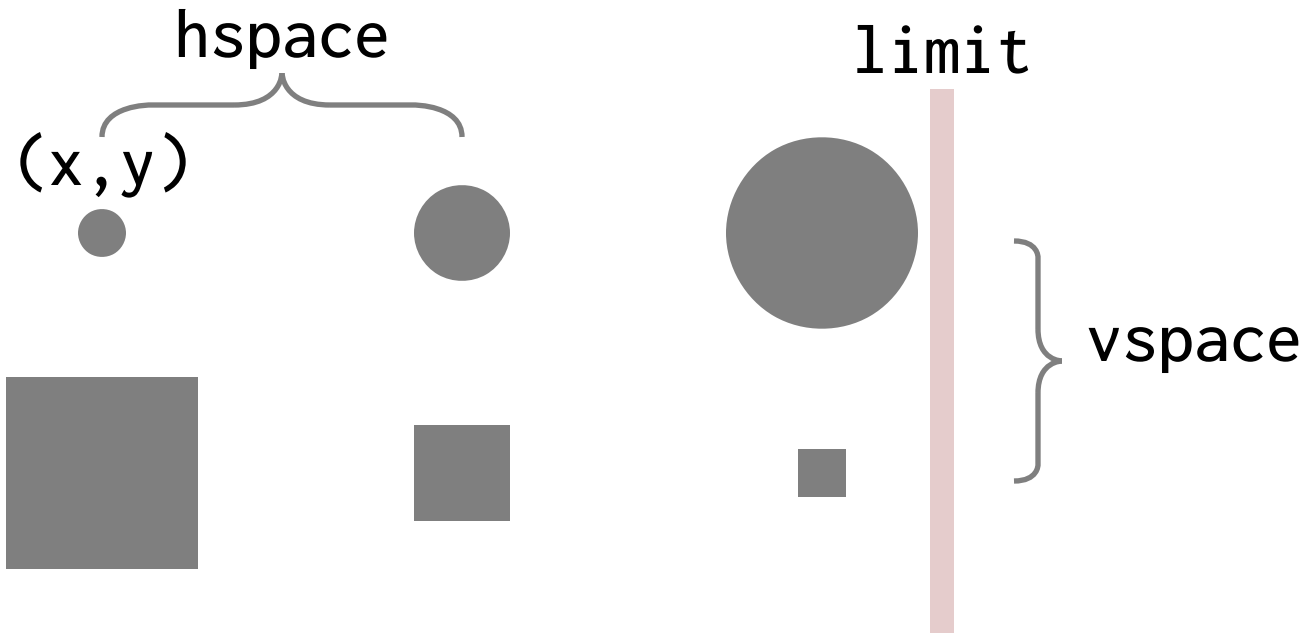
```
dchart -bar -left 50 -bottom 15 -right 70 -top 35 "test.d"
```



file

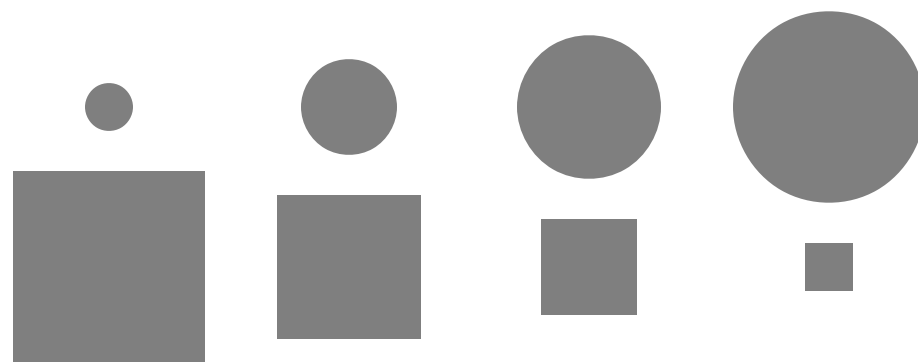


```
circle x y 2
circle x y 4
circle x y 8
square x y 8
square x y 4
square x y 2
```



**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        | <b>dchart</b> | options "file" (see next page) |
| Chart Legends | <b>legend</b> | "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

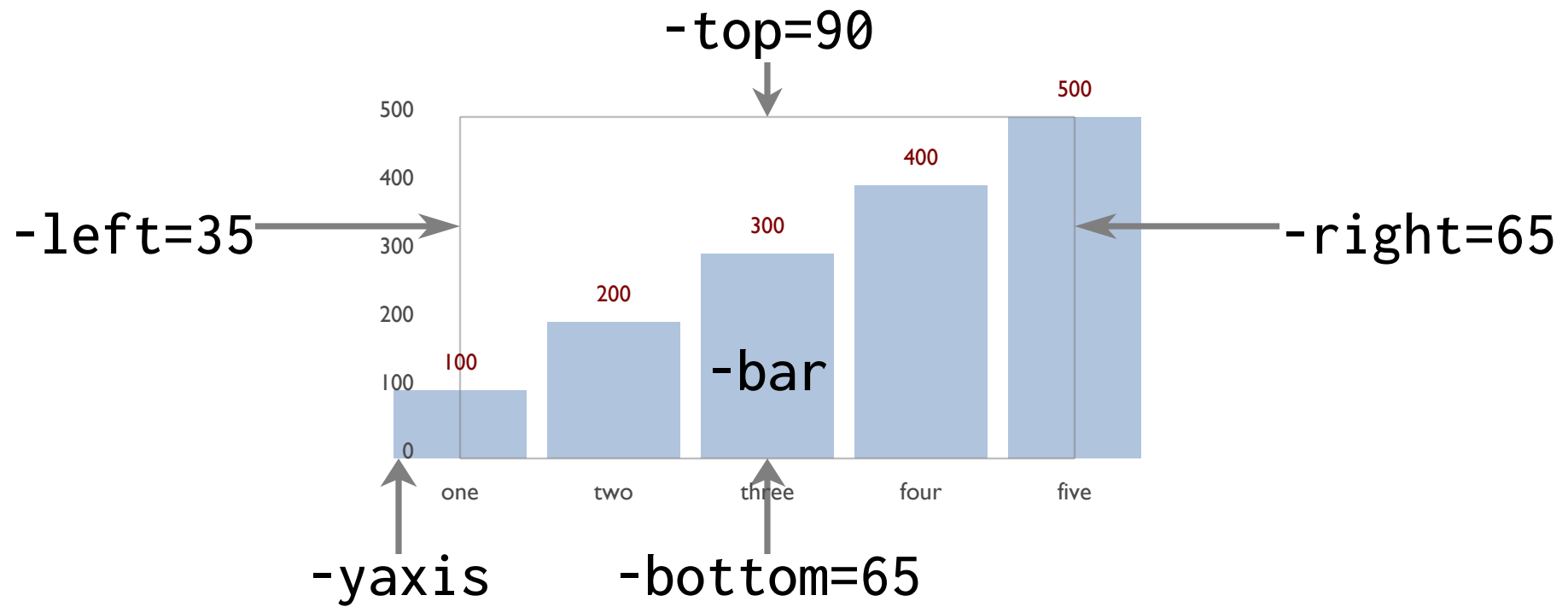
|            |                           |                                |
|------------|---------------------------|--------------------------------|
| -csv       | false                     | read CSV files                 |
| -frame     | false                     | show a colored frame           |
| -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

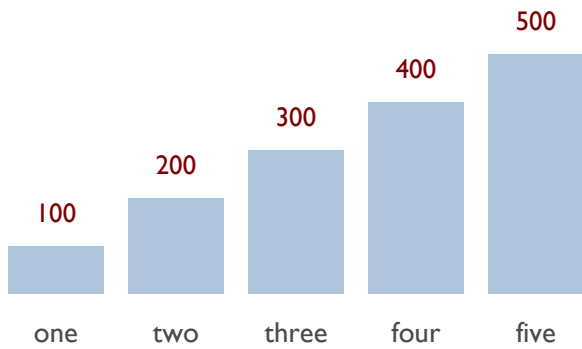
|         |          |                            |
|---------|----------|----------------------------|
| -top    | 80       | top of the chart           |
| -bottom | 30       | bottom of the chart        |
| -left   | 20       | left margin                |
| -right  | 80       | right margin     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

## Measures and Attributes

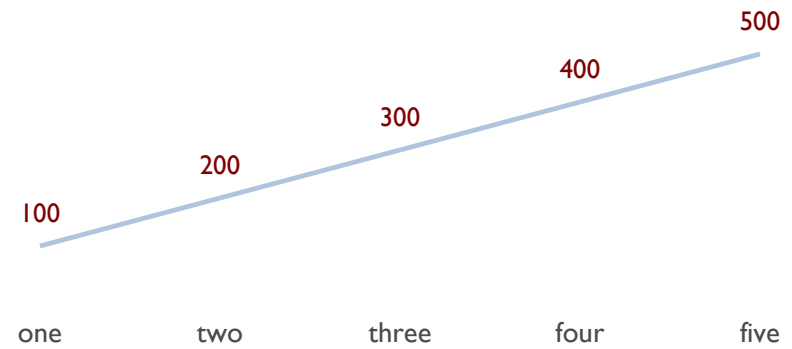
|             |                           |                            |
|-------------|---------------------------|----------------------------|
| -bgcolor    | white                     | background color           |
| -barwidth   | computed from data size   | barwidth                   |
| -color      | 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 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"
```