

Graphics Library Quick Reference

To use the graphics library, first import it at the top of your program:

```
from graphics import *
```

Next create a new graphics window object, and then create gui objects to draw into this window:

```
# creates new GraphWin object, 500x500 pixels in size
```

```
win = GraphWin("My GUI Program", 500, 500)
```

```
# creates a new Circle object centered at 50,50 with a radius of 20 pixels
```

```
circ = Circle(Point(50,50), 20)
```

```
# invoke the setFill method of the Circle object referred to by circ
```

```
circ.setFill("red")
```

```
# draw the circ object to the GraphWin win
```

```
circ.draw(win)
```

Here is some information about the GraphWin object and some of the Graphics objects you can use:

class GraphWin

```
GraphWin(title, width, height) #Constructor-makes a new GraphWin object
```

```
close()
```

```
flush() # update drawing to graphics window
```

```
getHeight()
```

```
getWidth()
```

```
# wait for mouse click and return Point obj representing click location
```

```
getMouse()
```

```
setBackground(color)
```

```
#Change screen coordinates
```

```
setCoords(lowerLeftX, lowerLeftY, upperRightX, upperRightY)
```

class Point

`Point(x, y) #Constructor`

`clone()` # create a new Point object that is an exact copy of this one
`getX()`
`getY()`

Methods common to all Graphics Object classes:

`draw(graphwin):` # Draw the object in graphwin, which should be a
 # GraphWin object. A GraphicsObject may only be drawn
 # into one window.
`move(dx, dy):` # move object dx units in x and dy units in y direction
`setFill(color):` # Set interior color to color
`setOutline(color):` # Set outline color to color
`setWidth(width):` # Set line weight to width
`undraw():` # Undraw the object (i.e. hide it).
`clone():` # Make an exact copy of object and its properties (color,
fill, etc.)

class Line

`Line(p1, p2)`

`clone()`
`setArrow(option)`
`getCenter()`
`getP1()`
`getP2()`

`draw(graphwin)`
`move(dx, dy)`
`setFill(color)`
`setOutline(color)`
`setWidth(width)`

class Rectangle

```
Rectangle( p1, p2)  # p1 and p2 are points for upper left lower rt
```

```
clone()
```

```
getCenter()
```

```
getP1()
```

```
getP2()
```

```
draw(graphwin)
```

```
move(dx, dy)
```

```
setFill(color)
```

```
setOutline(color)
```

```
setWidth(width)
```

```
undraw()
```

class Circle

```
Circle(p1, radius)      # p1 is a Point at the center of the circle
```

```
clone()
```

```
getCenter()
```

```
getRadius()
```

```
getP1()  # returns a clone of the corresponding corner of the
```

```
getP2()  # circle's bounding box (opposite corners of bounding square)
```

```
draw(graphwin)
```

```
move(dx, dy)
```

```
setFill(color)
```

```
setOutline(color)
```

```
setWidth(width)
```

```
undraw()
```

class Oval

```
Oval(p1, p2)           # p1 and p2 are opposite corners of bounding rectangle
```

```
clone()
```

```
getCenter()
```

```
getP1()
getP2()

draw(graphwin)
move(dx, dy)
setFill(color)
setOutline(color)
setWidth(width)
```

class Polygon

```
Polygon(<list of points>)
# ex. triangle: Polygon ([Point(10,20), Point(30,40), Point(10,60)])

getPoints() # return a list of Points in the polygon
clone()

draw(graphwin)
move(dx, dy)
setFill(color)
setOutline(color)
setWidth(width)
undraw()
```

class Text

```
Text(p, text) # p is center point and text is string

clone()
getText()
setText(text)
setTextColor(color)
setFace(family) # set font face, ex. "arial" "courier"
setSize(size) # set font size (5-36 are legal)
setStyle(style) # set font style ex. "bold" "italic"

draw(graphwin)
move(dx, dy)
```

```
setFill(color)
setOutline(color)
setWidth(width)
undraw()
```

class Entry

GUI object into which user can type text

```
Entry(pt, width)      # pt is anchor Point (center)

getAnchor()           # returns the center Point
getText()              # returns the current text
setText(string)        # sets the text to string
setSize(point)         # sets the found size (5-36 are legal)
setStyle(style)        # sets the font style
setTextColor(color)    # sets the text color

draw(graphwin)
move(dx, dy)
setFill(color)
setOutline(color)
setWidth(width)
undraw()
```

Animation

For animation, you may need to import the **sleep** function from the **time** module.

```
from time import sleep
sleep(0.5) #pause for 0.5 seconds
```

Colors

Colors can be represented two ways in the Graphics library. One way is to specify the red, green, and blue components using **color_rgb(r,g,b)**. Each of the color values should be in the range **0-255**. A handy **online color picker** can help you find the right shade for your masterpiece.

Alternatively, the Graphics library supports a number of built-in color names. The complete list is below. Shades of **grey** can be spelled **gray** or **grey**. An interactive version of this color map is available by using the python shell.

```
$ python
>>> from colorPicker import *
>>> colorPicker()
alice blue                240    248    255
AliceBlue                 240    248    255
antique white             250    235    215
AntiqueWhite              250    235    215
AntiqueWhite1             255    239    219
AntiqueWhite2             238    223    204
AntiqueWhite3             205    192    176
AntiqueWhite4             139    131    120
aquamarine                127    255    212
aquamarine1               127    255    212
aquamarine2               118    238    198
aquamarine3               102    205    170
aquamarine4                69    139    116
azure                     240    255    255
azure1                    240    255    255
azure2                    224    238    238
azure3                    193    205    205
azure4                    131    139    139
beige                     245    245    220
bisque                    255    228    196
bisque1                   255    228    196
bisque2                   238    213    183
bisque3                   205    183    158
bisque4                   139    125    107
black                     0      0      0
blanched almond           255    235    205
BlanchedAlmond            255    235    205
blue                      0      0    255
blue violet               138     43    226
blue1                     0      0    255
blue2                     0      0    238
blue3                     0      0    205
blue4                     0      0    139
```

BlueViolet	138	43	226
brown	165	42	42
brown1	255	64	64
brown2	238	59	59
brown3	205	51	51
brown4	139	35	35
burlywood	222	184	135
burlywood1	255	211	155
burlywood2	238	197	145
burlywood3	205	170	125
burlywood4	139	115	85
cadet blue	95	158	160
CadetBlue	95	158	160
CadetBlue1	152	245	255
CadetBlue2	142	229	238
CadetBlue3	122	197	205
CadetBlue4	83	134	139
chartreuse	127	255	0
chartreuse1	127	255	0
chartreuse2	118	238	0
chartreuse3	102	205	0
chartreuse4	69	139	0
chocolate	210	105	30
chocolate1	255	127	36
chocolate2	238	118	33
chocolate3	205	102	29
chocolate4	139	69	19
coral	255	127	80
coral1	255	114	86
coral2	238	106	80
coral3	205	91	69
coral4	139	62	47
cornflower blue	100	149	237
CornflowerBlue	100	149	237
cornsilk	255	248	220
cornsilk1	255	248	220
cornsilk2	238	232	205
cornsilk3	205	200	177
cornsilk4	139	136	120

cyan	0	255	255
cyan1	0	255	255
cyan2	0	238	238
cyan3	0	205	205
cyan4	0	139	139
dark blue	0	0	139
dark cyan	0	139	139
dark goldenrod	184	134	11
dark gray	169	169	169
dark green	0	100	0
dark grey	169	169	169
dark khaki	189	183	107
dark magenta	139	0	139
dark olive green	85	107	47
dark orange	255	140	0
dark orchid	153	50	204
dark red	139	0	0
dark salmon	233	150	122
dark sea green	143	188	143
dark slate blue	72	61	139
dark slate gray	47	79	79
dark slate grey	47	79	79
dark turquoise	0	206	209
dark violet	148	0	211
DarkBlue	0	0	139
DarkCyan	0	139	139
DarkGoldenrod	184	134	11
DarkGoldenrod1	255	185	15
DarkGoldenrod2	238	173	14
DarkGoldenrod3	205	149	12
DarkGoldenrod4	139	101	8
DarkGray	169	169	169
DarkGreen	0	100	0
DarkGrey	169	169	169
DarkKhaki	189	183	107
DarkMagenta	139	0	139
DarkOliveGreen	85	107	47
DarkOliveGreen1	202	255	112
DarkOliveGreen2	188	238	104

DarkOliveGreen3	162	205	90
DarkOliveGreen4	110	139	61
DarkOrange	255	140	0
DarkOrange1	255	127	0
DarkOrange2	238	118	0
DarkOrange3	205	102	0
DarkOrange4	139	69	0
DarkOrchid	153	50	204
DarkOrchid1	191	62	255
DarkOrchid2	178	58	238
DarkOrchid3	154	50	205
DarkOrchid4	104	34	139
DarkRed	139	0	0
DarkSalmon	233	150	122
DarkSeaGreen	143	188	143
DarkSeaGreen1	193	255	193
DarkSeaGreen2	180	238	180
DarkSeaGreen3	155	205	155
DarkSeaGreen4	105	139	105
DarkSlateBlue	72	61	139
DarkSlateGray	47	79	79
DarkSlateGray1	151	255	255
DarkSlateGray2	141	238	238
DarkSlateGray3	121	205	205
DarkSlateGray4	82	139	139
DarkSlateGrey	47	79	79
DarkTurquoise	0	206	209
DarkViolet	148	0	211
deep pink	255	20	147
deep sky blue	0	191	255
DeepPink	255	20	147
DeepPink1	255	20	147
DeepPink2	238	18	137
DeepPink3	205	16	118
DeepPink4	139	10	80
DeepSkyBlue	0	191	255
DeepSkyBlue1	0	191	255
DeepSkyBlue2	0	178	238
DeepSkyBlue3	0	154	205

DeepSkyBlue4	0	104	139
dim gray	105	105	105
dim grey	105	105	105
DimGray	105	105	105
DimGrey	105	105	105
dodger blue	30	144	255
DodgerBlue	30	144	255
DodgerBlue1	30	144	255
DodgerBlue2	28	134	238
DodgerBlue3	24	116	205
DodgerBlue4	16	78	139
firebrick	178	34	34
firebrick1	255	48	48
firebrick2	238	44	44
firebrick3	205	38	38
firebrick4	139	26	26
floral white	255	250	240
FloralWhite	255	250	240
forest green	34	139	34
ForestGreen	34	139	34
gainsboro	220	220	220
ghost white	248	248	255
GhostWhite	248	248	255
gold	255	215	0
gold1	255	215	0
gold2	238	201	0
gold3	205	173	0
gold4	139	117	0
goldenrod	218	165	32
goldenrod1	255	193	37
goldenrod2	238	180	34
goldenrod3	205	155	29
goldenrod4	139	105	20
green	0	255	0
green yellow	173	255	47
green1	0	255	0
green2	0	238	0
green3	0	205	0
green4	0	139	0

GreenYellow	173	255	47
grey	190	190	190
grey0	0	0	0
grey1	3	3	3
grey2	5	5	5
grey3	8	8	8
grey4	10	10	10
grey5	13	13	13
grey6	15	15	15
grey7	18	18	18
grey8	20	20	20
grey9	23	23	23
grey10	26	26	26
grey11	28	28	28
grey12	31	31	31
grey13	33	33	33
grey14	36	36	36
grey15	38	38	38
grey16	41	41	41
grey17	43	43	43
grey18	46	46	46
grey19	48	48	48
grey20	51	51	51
grey21	54	54	54
grey22	56	56	56
grey23	59	59	59
grey24	61	61	61
grey25	64	64	64
grey26	66	66	66
grey27	69	69	69
grey28	71	71	71
grey29	74	74	74
grey30	77	77	77
grey31	79	79	79
grey32	82	82	82
grey33	84	84	84
grey34	87	87	87
grey35	89	89	89
grey36	92	92	92

grey37	94	94	94
grey38	97	97	97
grey39	99	99	99
grey40	102	102	102
grey41	105	105	105
grey42	107	107	107
grey43	110	110	110
grey44	112	112	112
grey45	115	115	115
grey46	117	117	117
grey47	120	120	120
grey48	122	122	122
grey49	125	125	125
grey50	127	127	127
grey51	130	130	130
grey52	133	133	133
grey53	135	135	135
grey54	138	138	138
grey55	140	140	140
grey56	143	143	143
grey57	145	145	145
grey58	148	148	148
grey59	150	150	150
grey60	153	153	153
grey61	156	156	156
grey62	158	158	158
grey63	161	161	161
grey64	163	163	163
grey65	166	166	166
grey66	168	168	168
grey67	171	171	171
grey68	173	173	173
grey69	176	176	176
grey70	179	179	179
grey71	181	181	181
grey72	184	184	184
grey73	186	186	186
grey74	189	189	189
grey75	191	191	191

grey76	194	194	194
grey77	196	196	196
grey78	199	199	199
grey79	201	201	201
grey80	204	204	204
grey81	207	207	207
grey82	209	209	209
grey83	212	212	212
grey84	214	214	214
grey85	217	217	217
grey86	219	219	219
grey87	222	222	222
grey88	224	224	224
grey89	227	227	227
grey90	229	229	229
grey91	232	232	232
grey92	235	235	235
grey93	237	237	237
grey94	240	240	240
grey95	242	242	242
grey96	245	245	245
grey97	247	247	247
grey98	250	250	250
grey99	252	252	252
grey100	255	255	255
honeydew	240	255	240
honeydew1	240	255	240
honeydew2	224	238	224
honeydew3	193	205	193
honeydew4	131	139	131
hot pink	255	105	180
HotPink	255	105	180
HotPink1	255	110	180
HotPink2	238	106	167
HotPink3	205	96	144
HotPink4	139	58	98
indian red	205	92	92
IndianRed	205	92	92
IndianRed1	255	106	106

IndianRed2	238	99	99
IndianRed3	205	85	85
IndianRed4	139	58	58
ivory	255	255	240
ivory1	255	255	240
ivory2	238	238	224
ivory3	205	205	193
ivory4	139	139	131
khaki	240	230	140
khaki1	255	246	143
khaki2	238	230	133
khaki3	205	198	115
khaki4	139	134	78
lavender	230	230	250
lavender blush	255	240	245
LavenderBlush	255	240	245
LavenderBlush1	255	240	245
LavenderBlush2	238	224	229
LavenderBlush3	205	193	197
LavenderBlush4	139	131	134
lawn green	124	252	0
LawnGreen	124	252	0
lemon chiffon	255	250	205
LemonChiffon	255	250	205
LemonChiffon1	255	250	205
LemonChiffon2	238	233	191
LemonChiffon3	205	201	165
LemonChiffon4	139	137	112
light blue	173	216	230
light coral	240	128	128
light cyan	224	255	255
light goldenrod	238	221	130
light goldenrod yellow	250	250	210
light gray	211	211	211
light green	144	238	144
light grey	211	211	211
light pink	255	182	193
light salmon	255	160	122
light sea green	32	178	170

light sky blue	135	206	250
light slate blue	132	112	255
light slate gray	119	136	153
light slate grey	119	136	153
light steel blue	176	196	222
light yellow	255	255	224
LightBlue	173	216	230
LightBlue1	191	239	255
LightBlue2	178	223	238
LightBlue3	154	192	205
LightBlue4	104	131	139
LightCoral	240	128	128
LightCyan	224	255	255
LightCyan1	224	255	255
LightCyan2	209	238	238
LightCyan3	180	205	205
LightCyan4	122	139	139
LightGoldenrod	238	221	130
LightGoldenrod1	255	236	139
LightGoldenrod2	238	220	130
LightGoldenrod3	205	190	112
LightGoldenrod4	139	129	76
LightGoldenrodYellow	250	250	210
LightGray	211	211	211
LightGreen	144	238	144
LightGrey	211	211	211
LightPink	255	182	193
LightPink1	255	174	185
LightPink2	238	162	173
LightPink3	205	140	149
LightPink4	139	95	101
LightSalmon	255	160	122
LightSalmon1	255	160	122
LightSalmon2	238	149	114
LightSalmon3	205	129	98
LightSalmon4	139	87	66
LightSeaGreen	32	178	170
LightSkyBlue	135	206	250
LightSkyBlue1	176	226	255

LightSkyBlue2	164	211	238
LightSkyBlue3	141	182	205
LightSkyBlue4	96	123	139
LightSlateBlue	132	112	255
LightSlateGray	119	136	153
LightSlateGrey	119	136	153
LightSteelBlue	176	196	222
LightSteelBlue1	202	225	255
LightSteelBlue2	188	210	238
LightSteelBlue3	162	181	205
LightSteelBlue4	110	123	139
LightYellow	255	255	224
LightYellow1	255	255	224
LightYellow2	238	238	209
LightYellow3	205	205	180
LightYellow4	139	139	122
lime green	50	205	50
LimeGreen	50	205	50
linen	250	240	230
magenta	255	0	255
magenta1	255	0	255
magenta2	238	0	238
magenta3	205	0	205
magenta4	139	0	139
maroon	176	48	96
maroon1	255	52	179
maroon2	238	48	167
maroon3	205	41	144
maroon4	139	28	98
medium aquamarine	102	205	170
medium blue	0	0	205
medium orchid	186	85	211
medium purple	147	112	219
medium sea green	60	179	113
medium slate blue	123	104	238
medium spring green	0	250	154
medium turquoise	72	209	204
medium violet red	199	21	133
MediumAquamarine	102	205	170

MediumBlue	0	0	205
MediumOrchid	186	85	211
MediumOrchid1	224	102	255
MediumOrchid2	209	95	238
MediumOrchid3	180	82	205
MediumOrchid4	122	55	139
MediumPurple	147	112	219
MediumPurple1	171	130	255
MediumPurple2	159	121	238
MediumPurple3	137	104	205
MediumPurple4	93	71	139
MediumSeaGreen	60	179	113
MediumSlateBlue	123	104	238
MediumSpringGreen	0	250	154
MediumTurquoise	72	209	204
MediumVioletRed	199	21	133
midnight blue	25	25	112
MidnightBlue	25	25	112
mint cream	245	255	250
MintCream	245	255	250
misty rose	255	228	225
MistyRose	255	228	225
MistyRose1	255	228	225
MistyRose2	238	213	210
MistyRose3	205	183	181
MistyRose4	139	125	123
moccasin	255	228	181
navajo white	255	222	173
NavajoWhite	255	222	173
NavajoWhite1	255	222	173
NavajoWhite2	238	207	161
NavajoWhite3	205	179	139
NavajoWhite4	139	121	94
navy	0	0	128
navy blue	0	0	128
NavyBlue	0	0	128
old lace	253	245	230
OldLace	253	245	230
olive drab	107	142	35

OliveDrab	107	142	35
OliveDrab1	192	255	62
OliveDrab2	179	238	58
OliveDrab3	154	205	50
OliveDrab4	105	139	34
orange	255	165	0
orange red	255	69	0
orange1	255	165	0
orange2	238	154	0
orange3	205	133	0
orange4	139	90	0
OrangeRed	255	69	0
OrangeRed1	255	69	0
OrangeRed2	238	64	0
OrangeRed3	205	55	0
OrangeRed4	139	37	0
orchid	218	112	214
orchid1	255	131	250
orchid2	238	122	233
orchid3	205	105	201
orchid4	139	71	137
pale goldenrod	238	232	170
pale green	152	251	152
pale turquoise	175	238	238
pale violet red	219	112	147
PaleGoldenrod	238	232	170
PaleGreen	152	251	152
PaleGreen1	154	255	154
PaleGreen2	144	238	144
PaleGreen3	124	205	124
PaleGreen4	84	139	84
PaleTurquoise	175	238	238
PaleTurquoise1	187	255	255
PaleTurquoise2	174	238	238
PaleTurquoise3	150	205	205
PaleTurquoise4	102	139	139
PaleVioletRed	219	112	147
PaleVioletRed1	255	130	171
PaleVioletRed2	238	121	159

PaleVioletRed3	205	104	127
PaleVioletRed4	139	71	93
papaya whip	255	239	213
PapayaWhip	255	239	213
peach puff	255	218	185
PeachPuff	255	218	185
PeachPuff1	255	218	185
PeachPuff2	238	203	173
PeachPuff3	205	175	149
PeachPuff4	139	119	101
peru	205	133	63
pink	255	192	203
pink1	255	181	197
pink2	238	169	184
pink3	205	145	158
pink4	139	99	108
plum	221	160	221
plum1	255	187	255
plum2	238	174	238
plum3	205	150	205
plum4	139	102	139
powder blue	176	224	230
PowderBlue	176	224	230
purple	160	32	240
purple1	155	48	255
purple2	145	44	238
purple3	125	38	205
purple4	85	26	139
red	255	0	0
red1	255	0	0
red2	238	0	0
red3	205	0	0
red4	139	0	0
rosy brown	188	143	143
RosyBrown	188	143	143
RosyBrown1	255	193	193
RosyBrown2	238	180	180
RosyBrown3	205	155	155
RosyBrown4	139	105	105

royal blue	65	105	225
RoyalBlue	65	105	225
RoyalBlue1	72	118	255
RoyalBlue2	67	110	238
RoyalBlue3	58	95	205
RoyalBlue4	39	64	139
saddle brown	139	69	19
SaddleBrown	139	69	19
salmon	250	128	114
salmon1	255	140	105
salmon2	238	130	98
salmon3	205	112	84
salmon4	139	76	57
sandy brown	244	164	96
SandyBrown	244	164	96
sea green	46	139	87
SeaGreen	46	139	87
SeaGreen1	84	255	159
SeaGreen2	78	238	148
SeaGreen3	67	205	128
SeaGreen4	46	139	87
seashell	255	245	238
seashell1	255	245	238
seashell2	238	229	222
seashell3	205	197	191
seashell4	139	134	130
sienna	160	82	45
sienna1	255	130	71
sienna2	238	121	66
sienna3	205	104	57
sienna4	139	71	38
sky blue	135	206	235
SkyBlue	135	206	235
SkyBlue1	135	206	255
SkyBlue2	126	192	238
SkyBlue3	108	166	205
SkyBlue4	74	112	139
slate blue	106	90	205
slate gray	112	128	144

slate grey	112	128	144
SlateBlue	106	90	205
SlateBlue1	131	111	255
SlateBlue2	122	103	238
SlateBlue3	105	89	205
SlateBlue4	71	60	139
SlateGray	112	128	144
SlateGray1	198	226	255
SlateGray2	185	211	238
SlateGray3	159	182	205
SlateGray4	108	123	139
SlateGrey	112	128	144
snow	255	250	250
snow1	255	250	250
snow2	238	233	233
snow3	205	201	201
snow4	139	137	137
spring green	0	255	127
SpringGreen	0	255	127
SpringGreen1	0	255	127
SpringGreen2	0	238	118
SpringGreen3	0	205	102
SpringGreen4	0	139	69
steel blue	70	130	180
SteelBlue	70	130	180
SteelBlue1	99	184	255
SteelBlue2	92	172	238
SteelBlue3	79	148	205
SteelBlue4	54	100	139
tan	210	180	140
tan1	255	165	79
tan2	238	154	73
tan3	205	133	63
tan4	139	90	43
thistle	216	191	216
thistle1	255	225	255
thistle2	238	210	238
thistle3	205	181	205
thistle4	139	123	139

tomato	255	99	71
tomato1	255	99	71
tomato2	238	92	66
tomato3	205	79	57
tomato4	139	54	38
turquoise	64	224	208
turquoise1	0	245	255
turquoise2	0	229	238
turquoise3	0	197	205
turquoise4	0	134	139
violet	238	130	238
violet red	208	32	144
VioletRed	208	32	144
VioletRed1	255	62	150
VioletRed2	238	58	140
VioletRed3	205	50	120
VioletRed4	139	34	82
wheat	245	222	179
wheat1	255	231	186
wheat2	238	216	174
wheat3	205	186	150
wheat4	139	126	102
white	255	255	255
white smoke	245	245	245
WhiteSmoke	245	245	245
yellow	255	255	0
yellow green	154	205	50
yellow1	255	255	0
yellow2	238	238	0
yellow3	205	205	0
yellow4	139	139	0
YellowGreen	154	205	50