

Handout 20

Introduction to graphics

20.1 Jeff's graphics environment

- Use the `acom` compiler rather than `gcc`
- Use custom commands
- Go through the sample code line-by-line and figure out what each command does!

```
#include <FPT.h>

int main()
{
    double swidth, sheight ;
    double lowleftx, lowlefty, width, height ;
    double x[10],y[10] ;
    int numpoints;
    double q, x0,y0,x1,y1 ;
    double p[2] ;

    // must do this before you do 'almost' any other
    // graphical tasks
    swidth = 400 ; sheight = 400 ;
    G_init_graphics (swidth, sheight) ;

    // draw a point
    G_rgb(1, 0, 0) ; // red
    G_point(200, 380) ;

    // draw a line
    G_rgb(0, 1, 0) ; // green
    G_line (0, 0, 399, 399) ;
}
```

```
// won't show if part is off screen
// G_line (0, 0, 400, 400) ;

// draw some rectangles
G_rgb(0, 0, 1) ; // blue
lowleftx = 200 ; lowlefty = 50 ; width = 10 ; height = 30 ;
G_rectangle (lowleftx, lowlefty, width, height) ;
lowleftx = 250 ;
G_fill_rectangle (lowleftx, lowlefty, width, height) ;

// draw a triangle
G_rgb(1, 1, 0) ; // yellow
G_triangle (10, 300, 40,300, 60,250) ;
G_fill_triangle (10,100, 40,100, 60,150) ;

// draw a circle
G_rgb(1, 0.5, 0) ; // orange
G_circle (100, 300, 75) ;
G_fill_circle (370, 200, 50) ;

// print text to graphics window
G_rgb(0, 0, 0) ; // black
G_draw_string ("hello",300,100) ;

// draw a polygon
x[0] = 100 ; y[0] = 100 ;
x[1] = 100 ; y[1] = 300 ;
x[2] = 300 ; y[2] = 300 ;
x[3] = 300 ; y[3] = 100 ;
x[4] = 200 ; y[4] = 175 ;
numpoints = 5 ;
G_polygon (x,y,numpoints) ;

// pause to look ...any key to continue
q = G_wait_key() ;

//
G_rgb (0.4, 0.2, 0.1) ; // brown
G_fill_polygon (x,y,numpoints) ;

G_rgb (0.5, 0.8, 0.4) ;// what color is this?

// input from mouse click
G_wait_click(p) ; // wait for a mouse click
x0 = p[0] ; y0 = p[1] ; // extract coordinates
printf("you clicked the point x=%lf, y=%lf\n", x0,y0);
G_fill_rectangle (x0-2, y0-2, 4,4) ;// mark the clicked point
```

```
// second mouse click
G_wait_click(p) ;
x1 = p[0] ; y1 = p[1] ;
G_fill_rectangle (x1-2, y1-2, 4,4) ;

// connect clicked points with line
G_rgb (0.5, 0.5, 0.5) ; // a grey
G_line (x0,y0, x1,y1) ;

q = G_wait_key() ; // pause again before exit

G_close() ; // terminate graphics

}
```

20.2 Practice problems

- Draw graph paper
- Make some fun “line art”
- Make a “target” with rings of alternating colors
- Make a checkers board