Translation/Rotation

14.1 & 14.5
Translate/Rotate

• translate() is a clear and simple way to relocate or replicate portions of a drawing
• rotate() makes possible some drawing that would be very difficult without it
// notice both rectangles are "drawn at (0,0)"
rect(0,0,40,80);
fill(255,0,0);
translate(25,50);
rect(0,0,40,80);
// move to the center of the left edge
translate(0, height/2);
int picketWidth = 10;
int picketHeight = 100;

// draw the top rail, as wide as a single picket
rect(0, picketHeight/4, width, picketWidth);

// draw the bottom rail
rect(0, picketHeight*3/4, width, picketWidth);

// draw one picket
rect(0, 0, picketWidth, picketHeight);
line(0, 0, picketWidth/2, -picketWidth/2);
line(picketWidth, 0, picketWidth/2, -picketWidth/2);

// move over and draw another picket
translate(picketWidth*2, 0);
rect(0, 0, picketWidth, picketHeight);
line(0, 0, picketWidth/2, -picketWidth/2);
line(picketWidth, 0, picketWidth/2, -picketWidth/2);
// move to the center of the left edge
translate(0, heigth/2);
int picketWidth = 10;
int picketHeight = 100;

// move over and draw another picket
translate(picketWidth*2, 0);
rect(0, 0, picketWidth, picketHeight);
line(0, 0, picketWidth/2, -picketWidth/2);
line(picketWidth, 0, picketWidth/2, -picketWidth/2);

// move over and draw another picket
translate(picketWidth*2, 0);
rect(0, 0, picketWidth, picketHeight);
line(0, 0, picketWidth/2, -picketWidth/2);
line(picketWidth, 0, picketWidth/2, -picketWidth/2);

// repeat as necessary
// move to the center of the left edge
translate(0, height/2);
int picketWidth = 10;
int picketHeight = 100;

// looking ahead - doing it with a loop
int picketPosition = 0;
while( picketPosition < width ) {
    rect(0,0, picketWidth, picketHeight);
    line(0,0, picketWidth/2, -picketWidth/2);
    line(picketWidth,0, picketWidth/2, -picketWidth/2);
    translate(picketWidth*2, 0);
    picketPosition = picketPosition + picketWidth*2;
}
fill(255,0,0); // red
line(-100,0,100,0);
line(0,-100,0,100);
rect(0,0,20,10);

translate(30,30);
fill(0,0,255); // blue
line(-100,0,100,0);
line(0,-100,0,100);
rect(0,0,20,10);

translate(30,30);
rotate(PI/4);
fill(0,255,0); // green
line(-100,0,100,0);
line(0,-100,0,100);
rect(0,0,20,10);
void setup() {
    size(400, 400);
}
void draw() {
    translate(width/2, height/2);
    rotate(mouseX);
    rect(0, 0, 100, 100);
}
Write a program that draws this
void setup() {
    size(200, 200);
    rectMode(CENTER);
}

void draw() {
    translate(width/2, height/2);
    rotate(mouseX);
    translate(50, 0);
    rotate(PI/4);
    rect(0, 0, 50, 50);
}