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CS 4600

Write up for Hwk 2

Pictures above show development of circle algorithm. The code for drawCircle is below. Essentially x and y act as a position that the new pixel is to be placed determined by the algorithm. Once determined we take the center points and place pixels relative to them based on the calculation.

```
void drawCircle(int x0, int y0, int R)
{
    // Task 2
    // This function should draw a circl
    // where (x0, y0) is the center of t
    int x, y, D;
    x = 0;
    y = R;
    D = 1 - R;
    putPixel(x0, y0 + y);
    putPixel(x0 + R, y0);
    putPixel(x0 - R, y0);
    putPixel(x0, y0 - R);
    while (y > x) {
        if (D < 0) {
            D +=  2 * x + 3;
        }
        else {
            D += + 2 * (x - y) + 5;
            y -= 1;
        }
        x += 1;

        putPixel(x0 + x, y0 + y);
        putPixel(x0 + y, y0 + x);
        putPixel(x0 + x, y0 - y);
        putPixel(x0 + y, y0 - x);
        putPixel(x0 - x, y0 + y);
        putPixel(x0 - y, y0 + x);
        putPixel(x0 - x, y0 - y);
        putPixel(x0 - y, y0 - x);
    }
```

Line rasterization ended up being four cases in my head: lines slated up, slated down, horizontal and vertical lines. From there any lines that go from right to left, we just flip the x1 and x2 position and we are back to the four cases listed. Otherwise both algorithms are pretty straightforward following the algorithms presented in class.

```
if (x1 < x2 && absy < absx && y1 < y2) { //slanted up lines
    while (x1 < x2) {
        if (D <= 0) {
            D += inc0;
        }
        else {
            D += inc1;
            y1 += 1;
        }
        x1 += 1;
        putPixel(x1, y1);
    }
}
else if (x1 == x2 && y1 < y2) { //vertical lines
    while (y1 < y2) {
        y1 += 1;
        putPixel(x1, y1);
    }
}
else if (y1 == y2 && x1 < x2) { //horizontal lines
    while (x1 < x2) {
        x1 += 1;
        putPixel(x1, y1);
    }
}
else { //slanted down lines
    inc1 = 2 * (dy + dx);
    while (x1 < x2) {
        if (D > 0) {
            D += inc0;
        }
        else {
```