

Incremental line drawing Algo: (DDA)

basic idea

input line (x_0, y_0) (x_1, y_1)

$$\text{slope } m = \frac{y_1 - y_0}{x_1 - x_0}$$

now line drawing equation

$$\frac{y - y_1}{y_1 - y_0} = \frac{x - x_1}{x_1 - x_0}$$

$$\Rightarrow y = m(x - x_1) + y_1 \quad \text{--- (i)}$$

$$x = \frac{1}{m} (y - y_1) + x_1 \quad \text{--- (ii)}$$

so, x for calculation

y

"

"

for zone zero:

(i) x starts at x_0
(ii) y starts at y_0 / y_0 is
 $\text{draw_pixel}(x_0, y_0)$
 $\text{for}(i = x_0 + 1; i \leq x_1; i++)$
{
 $y_0 = y_0 + \text{fabs}(m)$
 $\text{draw_pixel}(i, \text{round}(y_0))$
}

Zone - 1 $\text{draw}(x_0, y_0)$
 $\text{for}(i = y_0 + 1; i \leq y_1; i++)$ {
 $x_0 = x_0 + \frac{\text{fabs}(1)}{m}$;
 $\text{draw}(\text{round}(x_0), i)$;
}

Zone - 2:

~~for zone 2:~~

same as zone 1 except
 $x_0 = x_0 - \text{fabs}(m)$

Zone - 3:

$\text{draw}(x_0, y_0)$

$\text{for}(i = x_0 - 1; i \geq x_1; i--)$ {

zone 4:

$y_0 = y_0 + \text{fabs}(m);$
 $\text{draw}(i, \text{round}(y_0))$

}

Zone-4:

Same as zone 3 except
 $y_0 = y_0 - \text{fabs}(m);$

Zone-5:

~~draw~~ $\text{draw}(x_0, y_0)$

for($i = y_0; i \geq y_1; i--$) {

$x_0 = x_0 + \text{fabs}(m)$

~~draw~~ $\text{draw}(\text{round}(x_0), i);$

}

Zone-6:

Same as zone 5 except $x_0 = x_0 + \text{fabs}(m)$

Zone-7:

Same as zone 6 except

$y_0 = y_0 - \text{fabs}(m)$