CSE 423

Quiz : 1

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Section: 07

In any 2-dimensional plane if we connect two ~~line~~ points we get a ~~li~~ ~~sg~~ line segment. To join these point, ~~we~~ we ~~use~~ use one of the ~~A~~ algorithm named DDA algorithm.

DDA ~~d~~ algorithm avoids floating point multiplication by adding the slope with the points (x, y). It increments (x, y) coordinates instead of multiplying it. ~~Thus,~~ ~~it~~

Here, if slop → $-1 < slop < 1$

then,

$$x_{k+1} = x_k + 1$$
$$y_{k+1} = y_k + 1$$

else, the line is steeper

and,

$$x_{k+1} = x_k + \frac{1}{m}$$
$$y_{k+1} = y_k + 1$$

Thus, it avoids ~~n~~ floating point multiplication.

Ans. to the ques. No. 2

Advantages of using Mid point line algorithm are as follows.

① We can avoid ~~round off values~~ rounding off and also can avoid floating point multiplication.

② Time complexity is less than DDA algorithm

③ Accurate pixels can be acquaried.

④ This algorithm is faster than DDA algorithm.

These are some of the advantages..

Ans. to the ques. no. 3

Here,

$$x_0 = 19$$
$$y_0 = 30$$
$$x_1 = 10$$
$$y_1 = 51$$

(a) slope, $m = \dfrac{y_1 - y_0}{x_1 - x_0}$

$$= \dfrac{51 - 30}{10 - 19}$$

$$= -\dfrac{7}{3}$$

$$dx = 10 - 19 = -9$$
$$dy = 51 - 30 = 21$$

Here, $dx < 0$, $dy > 0$

and, $|dy| > |dx|$

So, The zone of the line is $\therefore$ Zone: 2

Here,

$dx = -9$

$dy = 21$

$d = 2dy - dx = 2 \times 21 - (-9)$

$= 42 + 9$

$= 51$

incr $E = 2dy = 2 \times 21 = 42$

incr $NE = 2 * (dy - dx) = 2 \times (21 + 9) = 60$

$X = x_0, \quad y = y_0$

X	Y	d	NE/E	d update	pixel
19	30	51	NE	111	(19, 30)
20	31	111	NE	171	(20, 31)
21	32	~~231~~ 171	NE	~~291~~ 231	(21, 32)
22	33	231	NE	291	(22, 33)

so, first 4 pixel

$$(19, 30)$$
$$(20, 31)$$
$$(21, 32)$$
$$(22, 33)$$

Ans. to the ques. No.-4

(a)

The coordinate of next pixel: $(1, R-1)$

(b)

The end pixel's coordinate

if we go 'E' 5 times

$$(x, y) = [(0+5), R] = (5, R)$$

if we go 'SE' seven times

$$(5, R) \rightarrow (12, R-7)$$

End pixel: $(12, R-7)$

(c)

We avoid floating point approach:

by taking whole number.

We know,

$$d = 1-R$$

but it was ~~t2-j~~ $1.25-R$

but we want to avoid floating point multiplication that's why we subtract 0.25 with it. it doesn't affect the result because 0.25 is 0 in this algorithm. Thus we avoid floating point.