COMPUTER GRAPHICS & MULTIMEDIA APPLICATIONS

Assignment 1

Fill in the blanks

(1) Higher (2) False

(3) The refresh buffer or frame buffer

(4) P_n where $P_n = 2dy - dx$

(5) $P_0 = 1 - r$

Short Q's

(1) Refresh CRT means the repeated drawing of a picture to keep the glowing of the Phosper intact

(2) The merits and demerits of direct view storage tubes (DVST) are as follows:

(i) It has a flat screen

(ii) Refreshing screen is not needed

(iii) Has poor contrast

(iv) Selecting of screen is not possible

(3) Roster Scan:

→ The electron beam is swept across the screen

→ Screen points / pixels are used to draw an image.

Random Scan:

→ The electron beam is directed only to the parts of screen where a picture is to be drawn

→ Cost is more

(4) ~~It includes:-~~

~~(i) Line~~

(4) Graphics Primitive Includes

(i) Line, Circles, Arcs, Rectangle.

(ii) Character fonts

(iii) Important Images

Three basic Attributes

Color

Width

Style

(5) Drawbacks of mid. point circle algorithm:-

→ Consumes much time

→ distance b/w the pixels is not equal

Long Answer

① Given,

Starting coordinate $= (x_0, y_0)$

Ending Coordinate $= (x_n, y_n)$

Step1 :- Calculate Δx & Δy from the I/P

$\Delta x = x_n - x_0$

$\Delta y = y_n - y_0$

Step2 : Calculate decision parameter P_k

$P_k = 2\Delta y - \Delta x$

Step3: Suppose the current point is (x_k, y_k) and the next point is (x_{k+1}, y_{k+1})

Find next depending on the value of decision Parameter P_k

Step1:

Case1:

If $P_k < 0$

$P_{k+1} = P_k + 2\Delta y$

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

$y_{k+1} = y_k$

case2:

If $P_k = 0$

$P_{k+1} = P_k + 2\Delta y - 2\Delta x$

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

$$y_{k+1} = y_{k+1}$$

Step 4:

Keep repeating step-3 until the end point is reached / number of iteration equals to $(\Delta x - 1)$ times

Problem

given,

Starting Coordinate $= (x_0, y_0) = (9, 18)$

Ending Coordinate $= (x_n, y_n) = (14, 22)$

Step 1: Calculate Δx & Δy

$$\Delta x = x_n - x_0$$
$$= 14 - 9 = 5$$

$$\Delta y = y_n - y_0$$
$$= 22 - 18 = 4$$

Step 2:

Calculate the decision parameters:

$$P_k = 2\Delta y - \Delta x$$
$$= 2 \times 4 - 5$$
$$= 3$$

$$P_k = 3$$

Step 3:

As $P_n >= 0$, So Case - 02 is satisfied

Thus,

$$P_{n+1} = P_n + 2\Delta Y - 2\Delta X$$

$$= 3 + (2 \times 4) - (2 \times 5)$$

$$= 1$$

$$X_{n+1} = X_n + 1$$

$$= 9 + 1$$

$$\text{\#} \quad Y_{n+1} = Y_n + 1$$

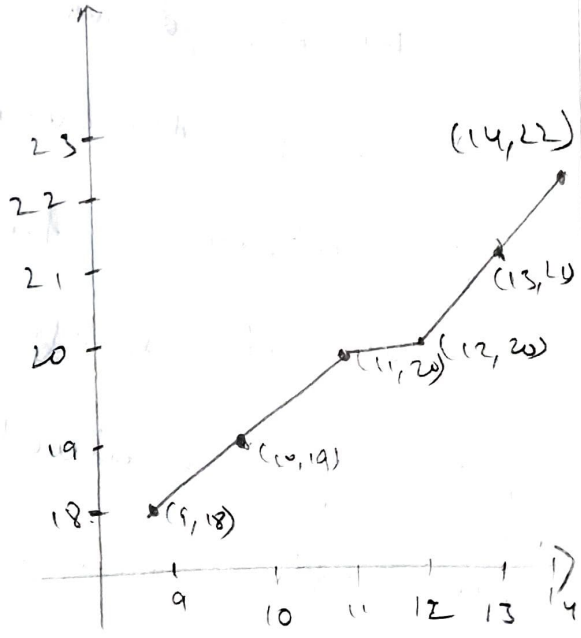
$$= 18 + 1$$

$$= 19$$

4^{th} Step-3 is executed until the end point is reached/ no. of iteration equal to 4 times.

No. of iterations $= \Delta x - 1 = 5 - 1 = 4$

P_n	P_{n+1}	X_{n+1}	Y_{n+1}
		9	18
3	1	10	19
1	-1	11	20
-1	7	12	20
7	5	13	21
5	3	14	22



The generated points b/w the starting coordinate (9,18) & ending coordinate (14,22) are (10,19), (11,20), (12,20), (13,21)