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Semester - 6th
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PBC-602

Computer Graphics

Practical

Q 1 DDA Program

```
# include <stdio.h>
# include <graphics.h>
# include <math.h>
void main()
{
  float x, y, x1, y1, x2, y2, dx, dy, steps;
  int i, gd = DETECT, gm;
  printf ("Enter (x1, y1) : ");
  scanf ("%f %f", &x1, &y1);
  printf ("Enter (x2, y2) : ");
  scanf ("%f %f", &x2, &y2);
  initgraph (&gd, &gdm, "");
  dx = abs (x2 - x1);
  dy = abs (y2 - y1);
  if (dx > dy)
    steps = dx;
  else
    steps = dy;
}
```

```
dx = dx/steps;
dy = dy/steps;
x = x1;
y = y1;
i = 1;
while (i <= steps)
{
    putpixel (x, y, 5);
    x = x + dx;
    y = y + dy;
    i = i + 1;
    delay (50);
}
delay (5000);
closegraph ();
}
```

DDA Algorithm :-

Starting coordinates = (X_0, Y_0)

Ending coordinates = (X_n, Y_n)

Step 1 :- Calculate Δx, Δy & M from the given input

we know that the steps of line M is given as:

$$\Delta X = X_n - X_0$$

$$\Delta Y = Y_n - Y_0$$

$$M = \Delta Y / \Delta X \quad = M = \frac{X_n - X_0}{Y_n - Y_0}$$

Steps 2 :- Find the number of steps or points in between the starting and ending coordinates.

$\Delta X > \Delta Y$ => absolute Δx

$\Delta X < \Delta Y$ = absolute ΔY

Step 3 :- Suppose the current point is (X_p, Y_p) & the next point is (X_{p+1}, Y_{p+1})

find the nex point :-

case 1 $(M < 1)$ ⟶ $X_{p+1} = (1 + X_p)$

$Y_{p+1} = (M + Y_p)$

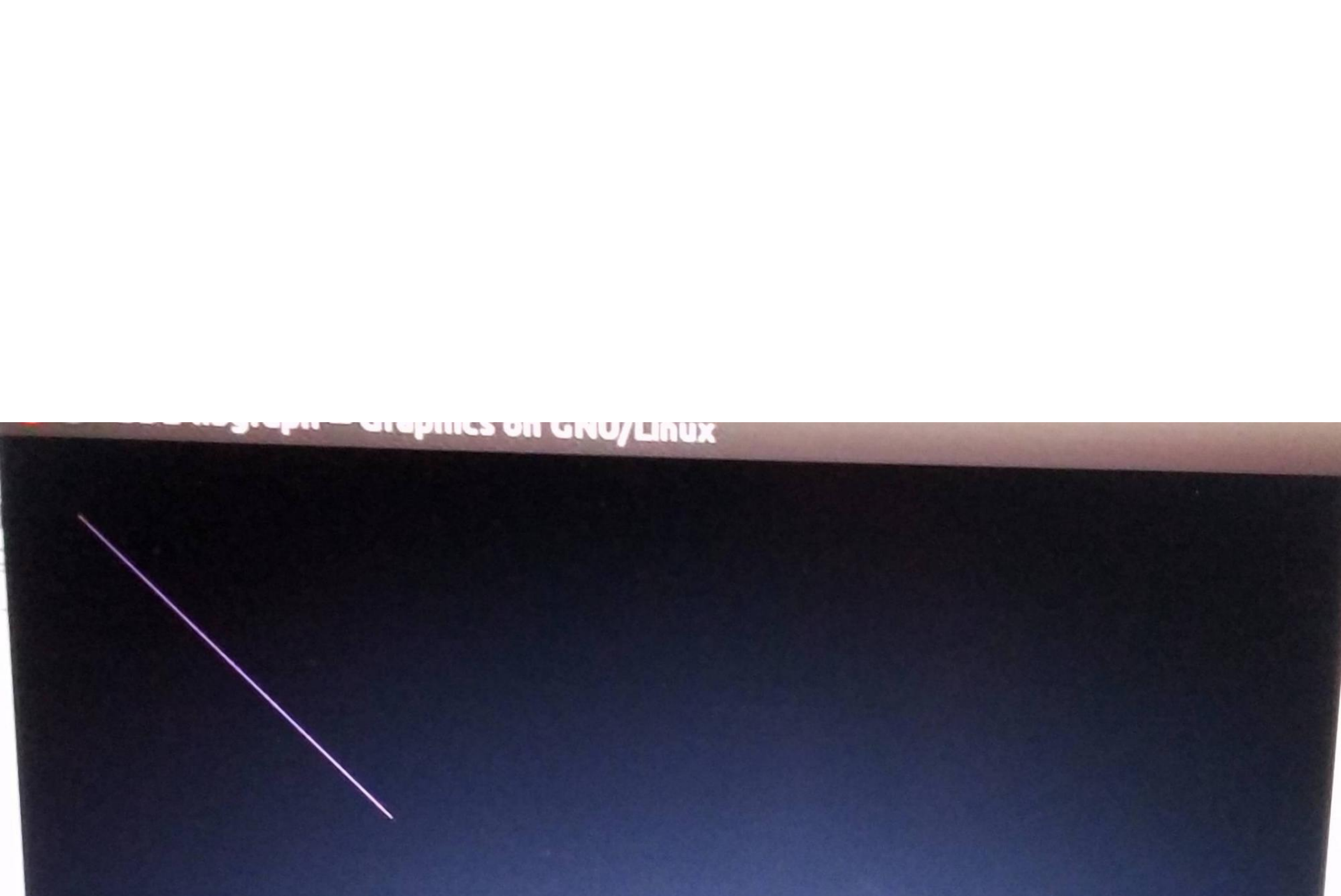
case 2 $(M = 1)$ ⟶ $X_{p+1} = (1 + X_p)$

$X_{p+1} = (1 + Y_p)$

case 3 $(M > 1)$ ⟶ $X_{p+1} = (1/M + X_p)$

$Y_{p+1} = (1 + Y_p)$

Step 4:- Keep repeating step 3 until the end point is reached or the no. of generated new points (including the starting & ending points) equals to the step counts



Q3 Traffic light

```
# include < stdio.h >
# include < graphic.h >

int main()
{
        int gd = DETECT, gm;
        initgraph (&gd, &gm, "NULL");

 Set color (WHITE);
 rectangle (140, 200, 145, 130);
 rectangle (130, 180, 155, 70);
 setcolor (RED);
 circle (142, 82, 6);
 floodfill (142, 82, RED);
 Setcolor (Yellow);
 circle (142, 100, 6);
 floodfill (142, 100, YELLOW);
 setcolor (GREEN);
```

```
circle (142, 118, 6);
floodfill (143, 118, GREEN);
setcolor (WHITE);
rectangle (150, 180, 250, 300);
rectangle (250, 180, 420, 300);
rectangle (180, 250, 220, 300);
line (200, 100, 150, 180);
line (200, 100, 250, 180);
line (200, 100, 370, 100);
line (370, 100, 420, 180);
setcolor (BROWN);
floodfill (152, 182, WHITE);
floodfill (252, 182, WHITE);
setcolor (LightRED);
floodfill (182, 252, WHITE);
Setcolor (LIGHT RED);
floodfill (200, 105, WHITE);
floodfill (210, 105, WHITE);
getch();
closegraph();
return 0;
}
```