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sec:- C subject code:- PBC-602

Q1

Problem statement:- write a program to draw a line using Bresenham's line algorithm.

Objective:- To understand how to plot line using line drawing algorithm.

Program :-

```
# include <stdio.h>
# include <graphics.h>
int main ()
{
int round (float num)
{
return num <0 ? num - 0.5 : num + 0.5
}
int x1 = 100, x2 = 300, y1 = 100, y2 = 200;
int gd= DETECT, gm ;
float pk, pkk, x, y, step;
  int dx= x2 - x1 ;
  int dy = y2 - y1 ;
```

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```
pk = 2 * dx - dy;
if (dx>dy)
{
step = dx;
}
else
{ step = dy;
}
initgraph (& gd, & gm, " ");
Out text xy (x1, y1, "A");
Outtext xy (x2, y2, "B");
putpixel (x1, y1, WHITE);
x = x1, y = y1;
while (step>0)
{
if (pk<0)
{
pkk = pk + 2*dy;
}
else
{ pkk = pk + 2*dy - 2*dx;
y++;
}
putpixel (rou(x), rou(y), WHITE);
x++;
step--;
```

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```
}
getch();
return 0;
```

Algorithum :- Bresenham line drawing Algorithum.

step 1 :- start Algorithum.

step 2 :- Declare varia $x_1, x_2, y_1, y_2, dx, dy$
P_k, P_{k+1}

step 3 :- Entervalues of x_1, y_1, x_2, y_2
where x_1, y_1 are starting points.
x_2, y_2 are ending points.

step 4 :- calculate $dx = x_2 - x_1$
calculate $dy = y_2 - y_1$
calculate $P_k = 2dy - dx$

step 5 :- Consider (x, y) as starting point and
x end maximum possible value of x

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if $dx < 0$, then $x_1 = x_2$, $y_1 = y_2$,
$x_{end} = x_1$

if $dx > 0$ then $x_{end} = x_1$, $y_2 = y_1$,
$x_{end} = x_2$.

Step 6:- generate point at (x, y) cordinates

Step 7:- Check if whole line is generated.
if $x_1 >= x_{end}$
stop.

Step 8:- calculate cordinates of next points

if $p_k < 0$ then

$p_{k+1} = p_k + 2*dy$
$x_{k+1} = x_{k+1}$
$y_{k+1} = y_k$

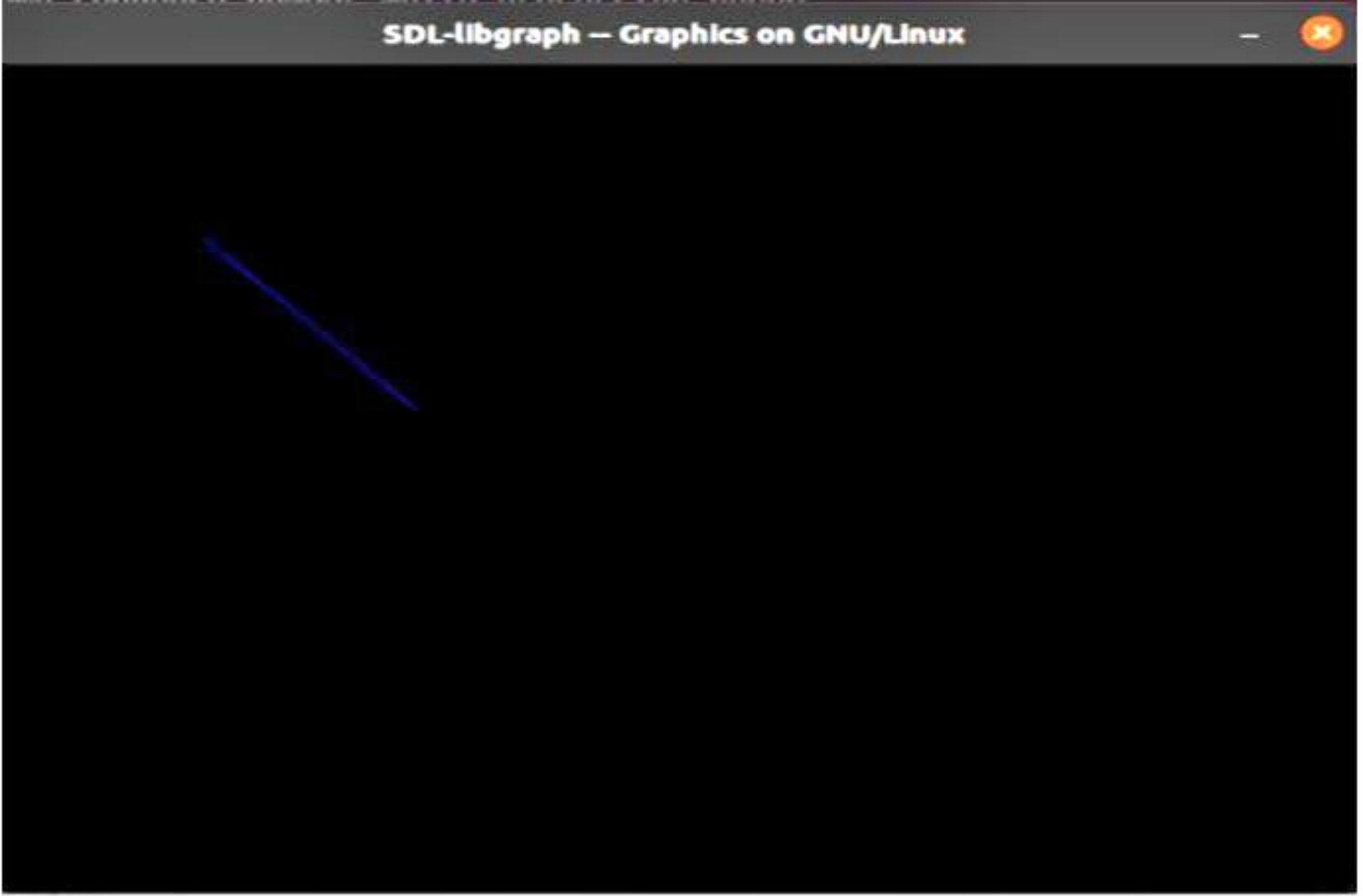
else
$p_k >= 0$ then

$p_{k+1} = p_k + 2*dy - 2*dx$
$x_{k+1} = x_k + 1$
$y_{k+1} = y_{k+1}$

Step 9:- Draw point of last (x, y) cordinates

Step 10:- goto step 7.

Step 11:- End of Algorithm.


SDL-libgraph — Graphics on GNU/Linux