# EXP 01:- DDA ALGORITHM

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DIV\BRANCH: COMPS 3 [A]

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Aim: To implement DDA algorithms for drawing a line segment between two given end points.

Objective: Draw the line using (vector) generation algorithms which determine the pixels that should be turned ON are called as digital differential analyzer (DDA).It is one of the techniques for obtaining a rasterized straight line. This algorithm can be used to draw the line in all the quadrants.

Theory:

DDA algorithm is an incremental scan conversion method. Here we perform calculations at each step using the results from the preceding step. The characteristic of the DDA algorithm is to take unit steps along one coordinate and compute the corresponding values along the other coordinate. Digital Differential Analyzer (DDA) algorithm is the simple line generation algorithm which is explained step by step here.

Algorithm:

Step l: Read end points of the line as (x l, y 1) & (x2, y2) such that xl != x2 and yl !

Step 2: Calculate dx = x2 — xl and dy = Y2 — yl

Step 3: if (dx >= dy) step = dx else step dy

Step 4: Xin = dx / step & yin = dy / step

Step 5: x = xl +0.5 + 0.5

Step 6: for (i 0; i < step; i++)

x = x + Xin Y Y + yin putpixel (x, y)

Program:

#include<iostream.h>

#include<graphics.h>

#include<conio.h>

#include<math.h>

#include<dos.h>

void main()

{

int gd=DETECT,gm;

int x1,x2,y1,y2,dx,dy,steps,xinc,yinc;

clrscr();

initgraph(&gd,&gm,"c:\\turboc3\\bgi");

cout<<"Enter the values of x1 and y1"<<endl;

cin>>x1>>y1;

cout<<"Enter the values of x2 and y2"<<endl;

cin>>x2>>y2;

dx=x2-x1;

dy=y2-y1;

if(abs(dx)>abs(dy))

steps=abs(dx);

else

steps=abs(dy);

xinc=dx/steps;

yinc=dy/steps;

for(int i=0;i<steps;i++)

{

putpixel(x1,y1,8);

x1=x1+xinc;

y1=y1+yinc;

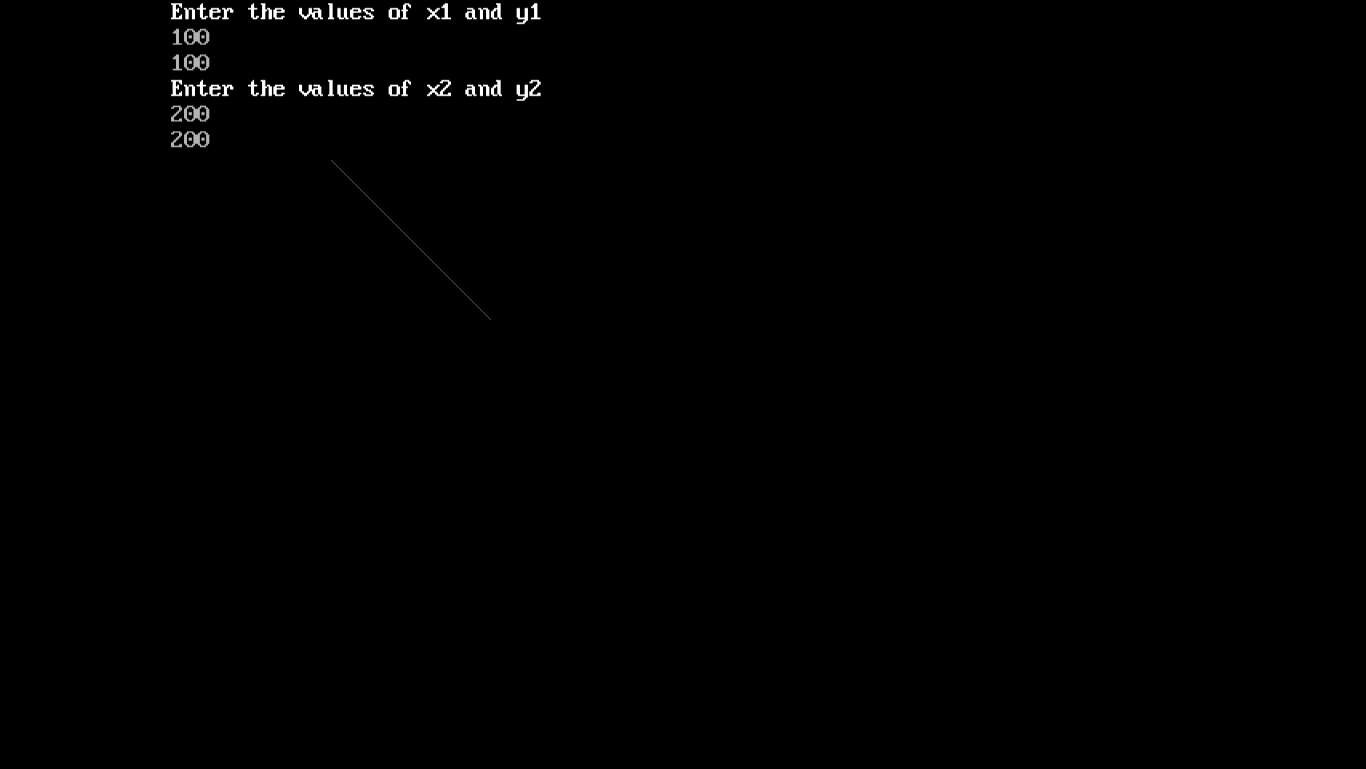
delay(50);}

getch();

closegraph();

}

Output:



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Conclusion: In conclusion DDA[Digital Differential Analyzer] algorithm is a simple and efficient method for rendering straight lines in computer graphics