

CG-Assignment DDA Line Drawing

Aim: Implementing DDA line drawing algorithm ~~from~~
in C using graphics.h library.

Algorithm:

- coordinates of start and endpoints are taken as (x_1, y_1) and (x_2, y_2)
- $dx = |x_2 - x_1|$, $dy = |y_2 - y_1|$
- number of steps to draw the line = dx if $dx > dy$ else dy .
- $x_{inc} = dx / \text{no. of steps}$ & $y_{inc} = dy / \text{no. of steps}$ → ~~float~~ float $X = x_1$, $Y = y_1$
- ~~for~~ loop from 0 to less than the no. of steps.
- $X += x_{inc}$
 $Y += y_{inc}$
put pixel at X, Y

Program:

Drawing lines with DDA algorithm

Code:

```
#include<stdio.h>
#include<graphics.h>
#include<conio.h>

int round(float x){
    return (int) x+0.5;
}

int abs(int x){
    int out;
    if(x>0)
        out=x;
    else
        out=x*(-1);
    return out;
}

void DDA(int x1, int y1, int x2, int y2){
```

```

int dx,dy,steps,i;
float X,Y,xi,yi;
dx=x2-x1;
dy=y2-y1;
if(abs(dx)>abs(dy))
    steps=abs(dx);
else
    steps=abs(dy);
xi = dx/(float)steps;
yi = dy/(float)steps;

X=x1;
Y=y1;

for(i=0;i<steps;i++){
    X+=xi;
    Y+=yi;
    putpixel(round(X),round(Y),WHITE);
}

}

void main()
{
    int a,b,c,d;
    int gd = DETECT,gm;
    clrscr();
    initgraph(&gd,&gm,"C:\\\\turbo3\\bgi");
    printf("Enter the coordinates for start point\n");
    scanf("%d%d",&a,&b);
    printf("Enter the coordinates for the second point\n");
    scanf("%d%d",&c,&d);
    DDA(a,b,c,d);
    printf("Hriday Keswani\nRollno. 88\nC21");
    getch();
    closegraph();
}

```

Output:

```
Enter the coordinates for start point
0
0
Enter the coordinates for the second point
300
300
Hriday Keswani
Rollno. 88
C21
```

Program:

Drawing dashed lines with DDA algorithm

Code:

```
#include<stdio.h>
#include<graphics.h>
#include<conio.h>

int round(float x){
    return (int) x+0.5;
}

int abs(int x){
    int out;
```

```

        if(x>0)
            out=x;
        else
            out=x*(-1);
        return out;
    }

void DDA(int x1, int y1, int x2, int y2){
    int dx,dy,steps,i;
    float X,Y,xi,yi;
    dx=x2-x1;
    dy=y2-y1;
    if(abs(dx)>abs(dy))
        steps=abs(dx);
    else
        steps=abs(dy);
    xi = dx/(float)steps;
    yi = dy/(float)steps;

    X=x1;
    Y=y1;

    for(i=0;i<steps;i++){
        X+=xi;
        Y+=yi;
        if(i%4!=0)
            putpixel(round(X),round(Y),WHITE);
    }
}

void main()
{
    int a,b,c,d;
    int gd = DETECT,gm;
    clrscr();
    initgraph(&gd,&gm,"C:\\\\turboc3\\\\bgi");
    printf("Enter the coordinates for start point\n");
    scanf("%d%d",&a,&b);
    printf("Enter the coordinates for the second point\n");
    scanf("%d%d",&c,&d);
    DDA(a,b,c,d);
    printf("Hriday Keswani\nRollno. 88\nC21");
    getch();
    closegraph();
}

```

Output:

```
Enter the coordinates for start point
0
0
Enter the coordinates for the second point
300
300
Hriday Keswani
Rollno. 88
C21
```

Program:

Drawing dotted lines with DDA algorithm

Code:

```
#include<stdio.h>
#include<graphics.h>
#include<conio.h>

int round(float x){
    return (int) x+0.5;
}
```

```

int abs(int x){
    int out;
    if(x>0)
        out=x;
    else
        out=x*(-1);
    return out;
}

void DDA(int x1, int y1, int x2, int y2){
    int dx,dy,steps,i;
    float X,Y,xi,yi;
    dx=x2-x1;
    dy=y2-y1;
    if(abs(dx)>abs(dy))
        steps=abs(dx);
    else
        steps=abs(dy);
    xi = dx/(float)steps;
    yi = dy/(float)steps;

    X=x1;
    Y=y1;

    for(i=0;i<steps;i++){
        X+=xi;
        Y+=yi;
        if(i%2!=0)
            putpixel(round(X),round(Y),WHITE);
    }
}

void main()
{
    int a,b,c,d;
    int gd = DETECT,gm;
    clrscr();
    initgraph(&gd,&gm,"C:\\\\turboc3\\\\bgi");
    printf("Enter the coordinates for start point\n");
    scanf("%d%d",&a,&b);
    printf("Enter the coordinates for the second point\n");
    scanf("%d%d",&c,&d);
    DDA(a,b,c,d);
    printf("Hriday Keswani\nRollno. 88\nC21");
    getch();
    closegraph();
}

```

Output:

```
Enter the coordinates for start point
0
0
Enter the coordinates for the second point
300
300
Hriday Keswani
Rollno. 88
C21
```