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Course - BCA

Section - 6A

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Q1. Write a C programme to implement DDA line drawing algorithm

Soln

DDA Algorithm

Step 1: calculate dx , dy .

$$dx = x_1 - x_0$$

$$dy = y_1 - y_0$$

Step 2: Depending upon value of dx and dy , choose number of steps to put pixels

$$\text{steps} = \text{abs}(dx) > \text{abs}(dy) ? \text{abs}(dx) : \text{abs}(dy);$$

Step 3: calculate increment in x and y for each steps

$$x_{inc} = dx / (\text{float}) \text{ steps};$$

$$y_{inc} = dy / (\text{float}) \text{ steps};$$

Step 4 : Put pixel for each step

$$x = x_0$$

$$y = y_0$$

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

{

putpixel(x, y, BLUE);

$$x += x_{inc}$$

$$y += y_{inc}$$

Code :

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

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

```
int main() {
```

```
    int tou(float num)
```

```
    {
```

```
        return num < 0 ? num - 0.5 : num + 0.5;
```

```
    }
```

```
    int x1 = 100, x2 = 250, y1 = 100, y2 = 250, step;
```

```
    int gd = DETECT, gm;
```

```
    float x, y, m;
```

```
    int dx = x2 - x1;
```

```
    int dy = y2 - y1;
```

```
    m = dy / dx;
```

```
    if (dx > dy)
```

```
        step = dx;
```

```
    else
```

```
        step = dy;
```

```
    initgraph(&gd, &gm, " ");
```

```
    outtextxy(x1, y1, "A");
```

```
outtextxy (x1, y1, "B");  
putpixel (u1, y1, RED);  
x = x1, y = y1;
```

```
while (step > 0) {  
    if (m < 1) {  
        x += 1;  
        y += m;
```

```
    }
```

```
    if (m >= 1) {
```

```
        x += 1/m
```

```
        y += 1
```

```
    }
```

```
    putpixel (xou(x), xou(y), RED);
```

```
    step--;
```

```
}
```

```
getch();
```

```
return 0;
```

```
}
```

A

B

