

Experiment 1

Aim: DDA line drawing algorithm implementation.

Algorithm:-

Steps: Two end points

Step 1: Input the coordinates of two ends $A(x_1, y_1)$ and $B(x_2, y_2)$ for the line AB seg.

Step 2: Calculate

$$dx = x_2 - x_1$$

$$dy = y_2 - y_1$$

Step 3: Calculate the length L

if $(\text{abs}(x_2 - x_1) \geq \text{abs}(y_2 - y_1))$

$$L = \text{abs}(x_2 - x_1);$$

else

$$L = \text{abs}(y_2 - y_1);$$

Step 4: Calculate increment factor.

$$\rightarrow x_i = dx / L$$

$$\rightarrow y_i = dy / L$$

$$x_{\text{new}} = x_1; \quad y_{\text{new}} = y_1.$$

Step 5: Initialize the point.

while $(i \leq L)$ {

$$x_{\text{new}} = x_{\text{new}} + x_i \quad x_{\text{new}} = x_i$$

$$y_{\text{new}} = y_{\text{new}} + y_i \quad y_{\text{new}} = y_i$$

Plot (Integer(x_{new}), Integer(y_{new})) ; $i++$; }

PROGRAM:

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

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

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

```
void main()
```

```
{
```

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

```
    float x, y, dx, dy, xi, yi, steps;
```

```
    int i, x1, y1, x2, y2, ch;
```

```
    initgraph(&gd, &gm, "C:\\TURBOC3\\BGI");
```

```
    printf("Roll No: 2003085 \nBatch: C21 \n");
```

```
    printf("Enter the first coordinate\n");
```

```
    scanf("%d %d", &x1, &y1);
```

```
    printf("Enter the second coordinate\n");
```

```
    scanf("%d %d", &x2, &y2);
```

```
    dx = abs(x2-x1);
```

```
    dy = abs(y2-y1);
```

```
    if(dx <= dy)
```

```
        steps = dy;
```

```
    else
```

```
        steps = dx;
```

```
    xi = dx/steps;
```

```
    yi = dy/steps;
```

```
    i = 0;
```

```
    x = x1; y = y1;
```

```
    printf("Enter the choice: \n");
```

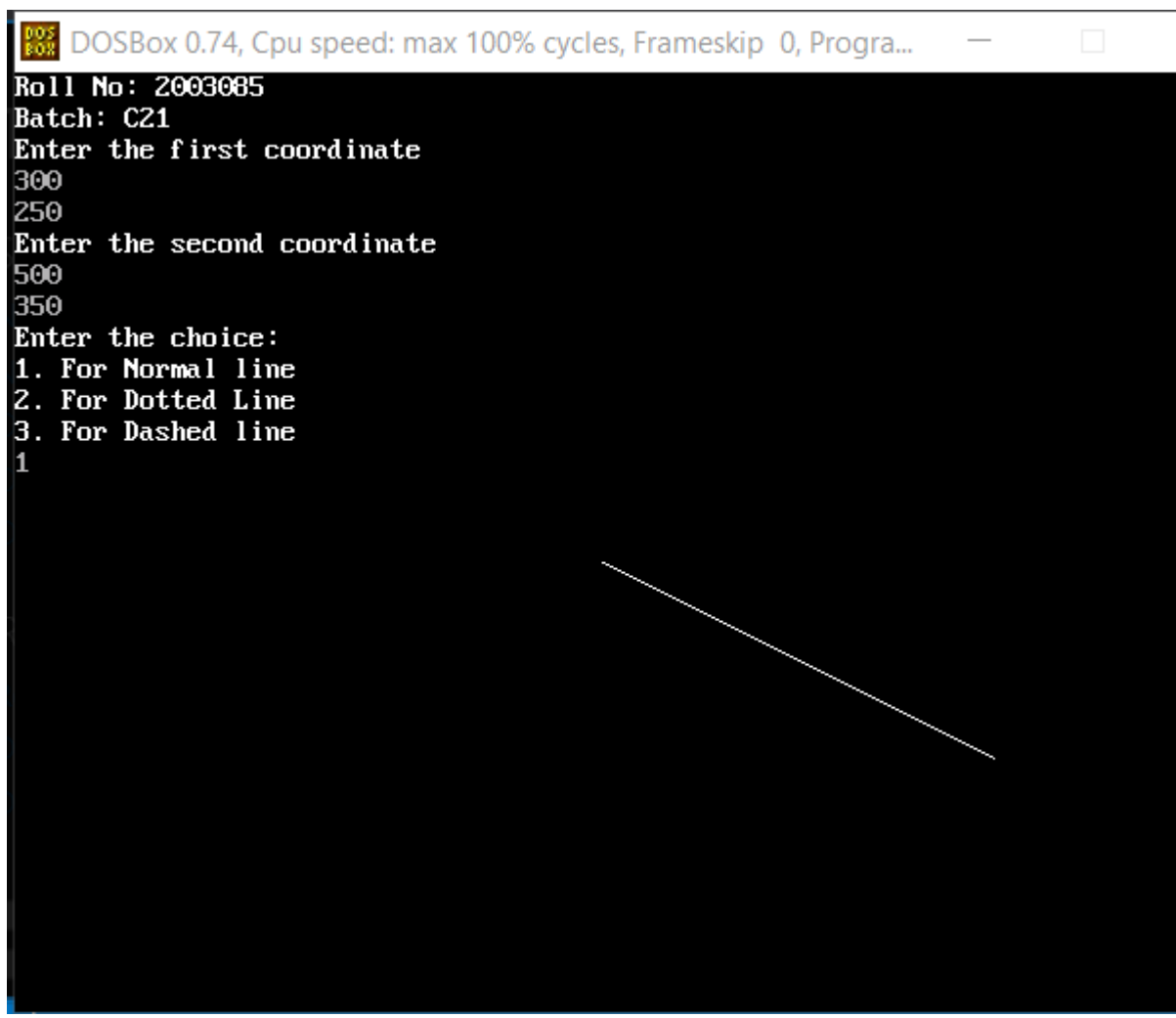
```
    printf("1. For Normal line \n2. For Dotted Line \n3. For Dashed line \n");
```

```
scanf("%d", &ch);
switch(ch){
case 1:{
while(i <= steps){
    putpixel(x, y, 15);
    x += xi;
    y += yi;
    i++;}
break;
}
case 2:{
while(i <= steps){
    if(i%10==0)
        putpixel(x, y, 15);
    x += xi;
    y += yi;
    i++;}
break;
}
case 3:{
while(i <= steps){
    if(i%6!=4 && i%6!=5)
        putpixel(x, y, 15);
    x += xi;
    y += yi;
    i++;}
break;
}
default:
```

```
        printf("Invalid Choice!\n");  
  
    }  
  
    getch();  
}
```

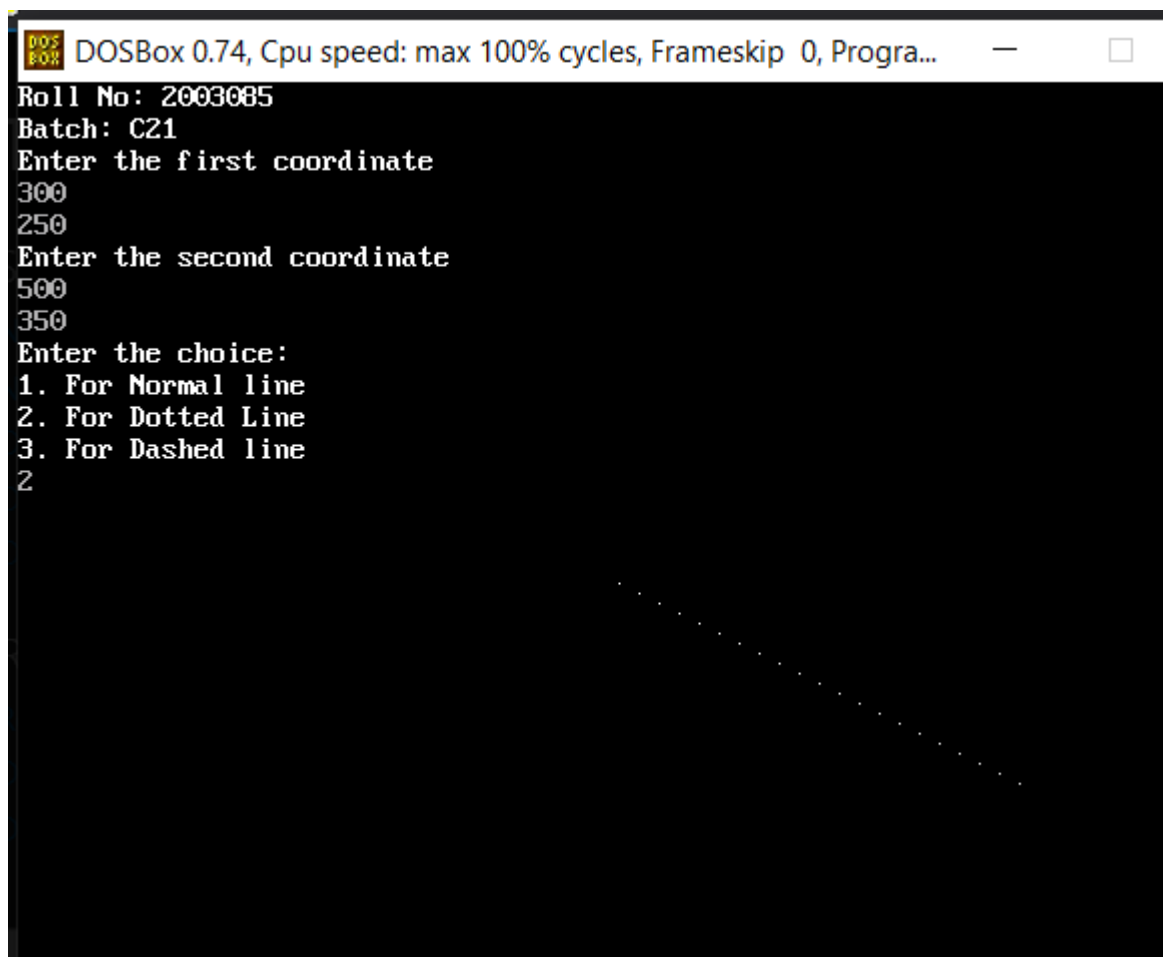
OUTPUT:

1. Normal Line:



```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Progra...  
Roll No: 2003085  
Batch: C21  
Enter the first coordinate  
300  
250  
Enter the second coordinate  
500  
350  
Enter the choice:  
1. For Normal line  
2. For Dotted Line  
3. For Dashed line  
1  
  
[A normal line is drawn on a black background, starting from the first coordinate (300, 250) and ending at the second coordinate (500, 350).]
```

2. Dotted Line:

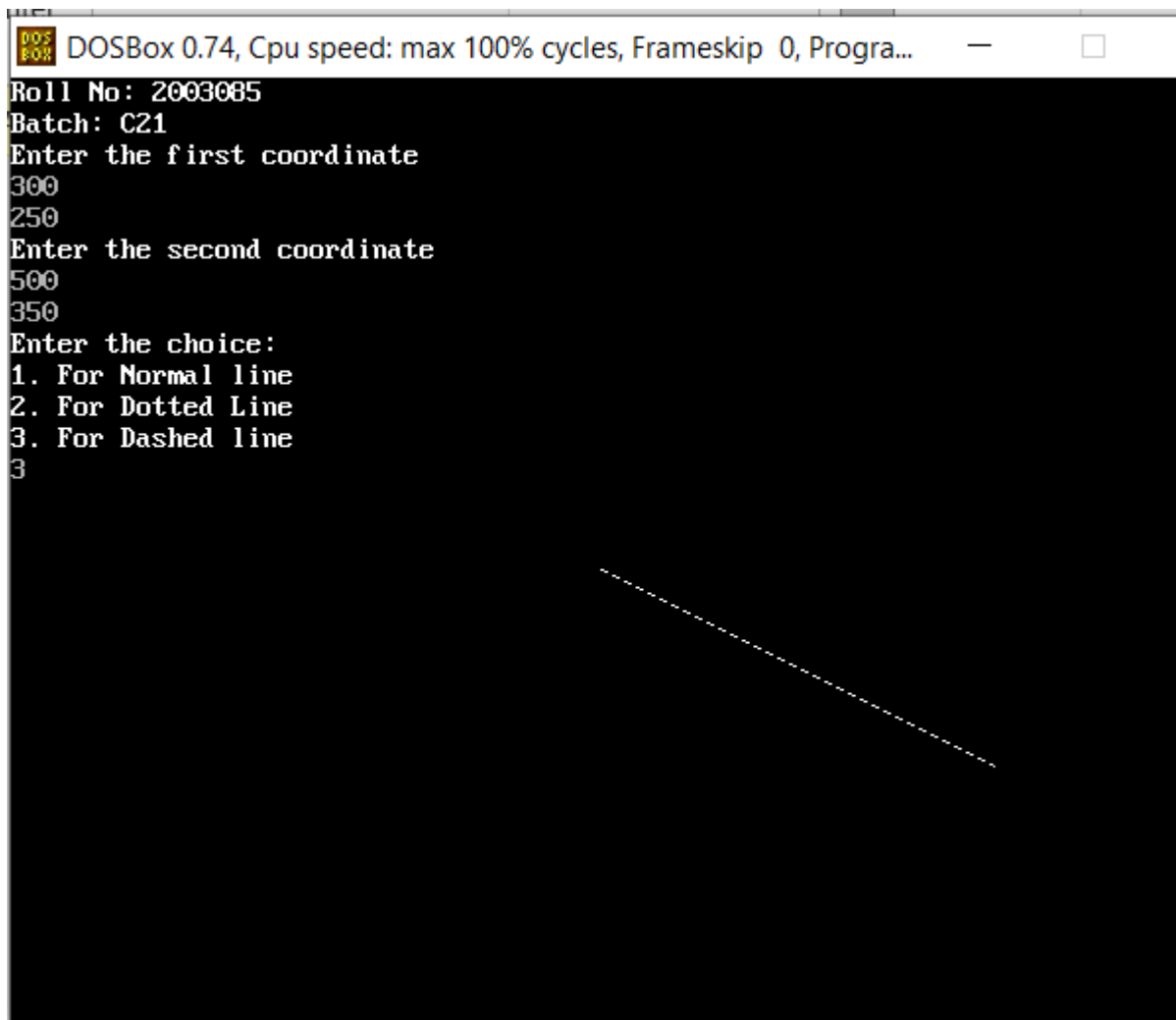


DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Progra...

```
Roll No: 2003085
Batch: C21
Enter the first coordinate
300
250
Enter the second coordinate
500
350
Enter the choice:
1. For Normal line
2. For Dotted Line
3. For Dashed line
2
```

The image shows a DOSBox window with a black background. The text is white. The program prompts for two coordinates and a choice. The user has entered 300, 250, 500, 350, and chosen option 2. A dotted line is drawn on the screen, starting from the first coordinate (300, 250) and ending at the second coordinate (500, 350). The line is composed of small dots.

3. Dashed Line



DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Progra...

```
Roll No: 2003085
Batch: C21
Enter the first coordinate
300
250
Enter the second coordinate
500
350
Enter the choice:
1. For Normal line
2. For Dotted Line
3. For Dashed line
3
```

The image shows a DOSBox window with a black background. The text is white. The program prompts for two coordinates and a choice. The first coordinate is 300, the second is 500, and the choice is 3. A dashed line is drawn from (300, 250) to (500, 350).