Title: Lab Work 1

Date of Submission: 28 May 2023
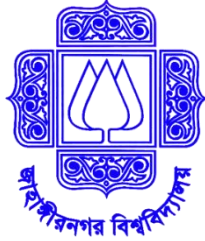
Submitted to-

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Scan Convert a Point:

```cpp
#include <graphics.h>
#include <iostream>
#include <conio.h>
using namespace std;
int main()
{
    int gd = DETECT, gm;
    int a, b;
    cout << "Enter the x-coordinate: ";
    cin >> a;
    cout << "Enter the y-coordinate: ";
    cin >> b;
    initgraph(&gd, &gm, "");
    putpixel(a, b, WHITE);
    getch();
    closegraph();
    return 0;
}
```

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Screenshot:

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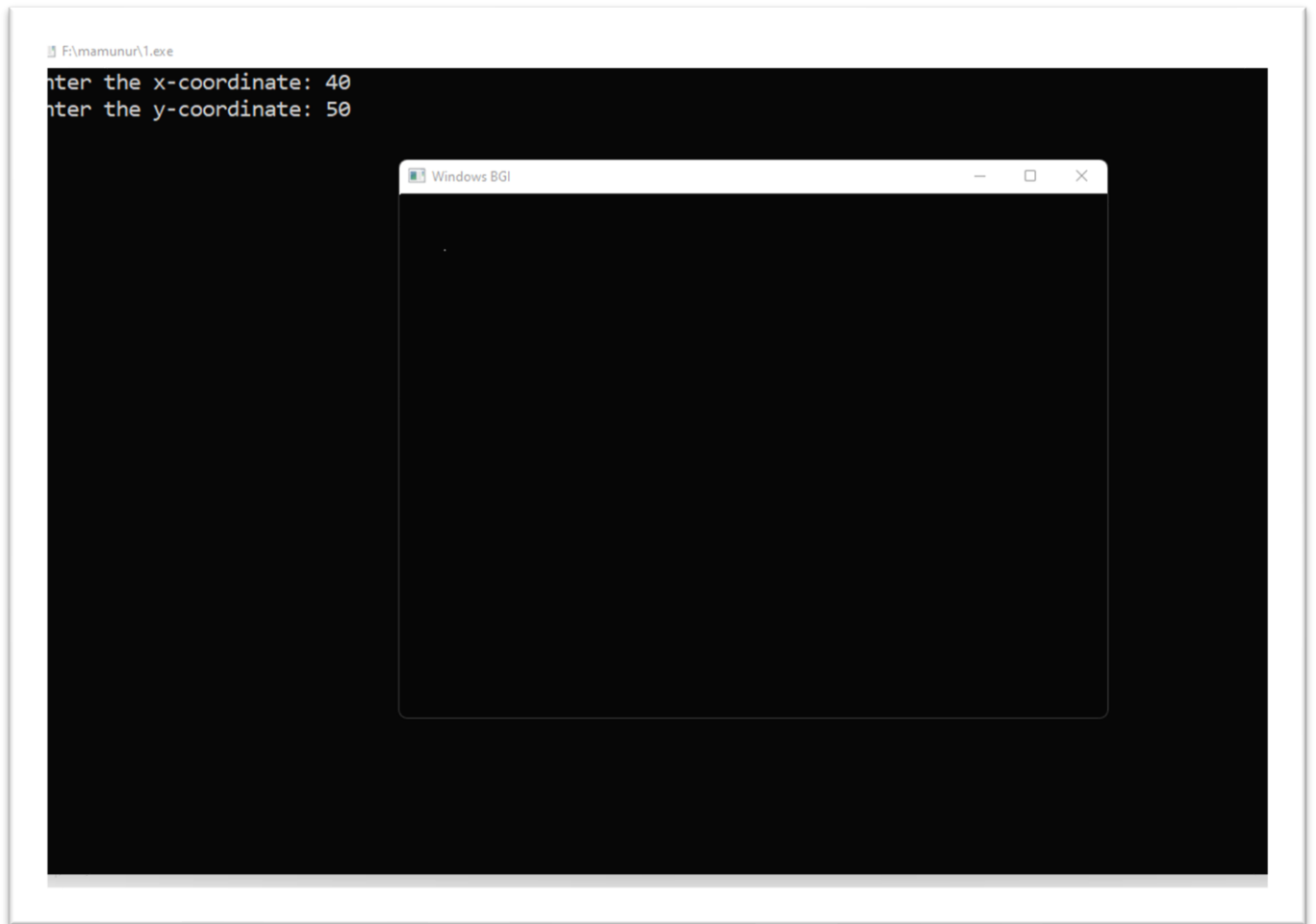
Scan Convert a Line (DDA Algorithm):
Source Code:

```cpp
#include <graphics.h>
#include <iostream>
#include <conio.h>
using namespace std;

int main() {
    int gd = DETECT, gm;
    int x1, y1, x2, y2;
    int steps, xinc, yinc, dx, dy;

    cout << "Enter the starting coordinates:";
    cin >> x1 >> y1;

    cout << "Enter the ending coordinates:";
    cin >> x2 >> y2;
    initgraph(&gd, &gm, "");
    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 = 1; i <= steps; i++) {
        putpixel(x1, y1, CYAN);
        delay(10);
        x1 = x1 + xinc;
        y1 = y1 + yinc;
    }
```
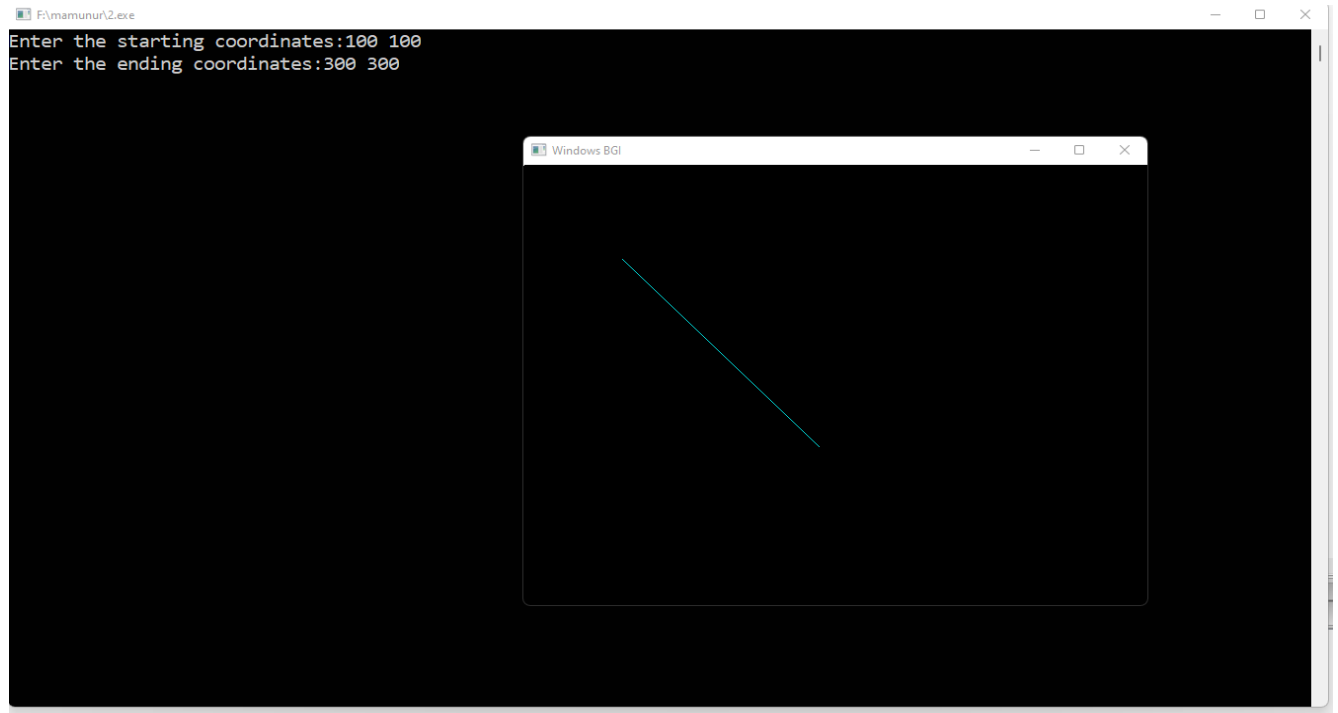
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```
    getch();
    closegraph();
    return 0;
}
```

Screenshot:

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Scan Convert a Line (Bresenham's Algorithm):

Source Code:

```cpp
#include <graphics.h>
#include <iostream>
#include <conio.h>
using namespace std;

void drawline(int x0, int y0, int x1, int y1) {
    int dx, dy, p, x, y;
    dx = x1 - x0;
    dy = y1 - y0;
    x = x0;
    y = y0;
    p = 2 * dy - dx;

    while (x < x1) {
        if (p >= 0) {
            putpixel(x, y, BLUE);
            y = y + 1;
            p = p + 2 * dy - 2 * dx;
        } else {
            putpixel(x, y, BLUE);
            p = p + 2 * dy;
        }
        x = x + 1;
        delay(10);
    }
}

int main() {
    int gd = DETECT, gm, error, x0, y0, x1, y1;

    cout << "Enter coordinates of first point:";
    cin >> x0 >> y0;

    cout << "Enter coordinates of second point:";
```
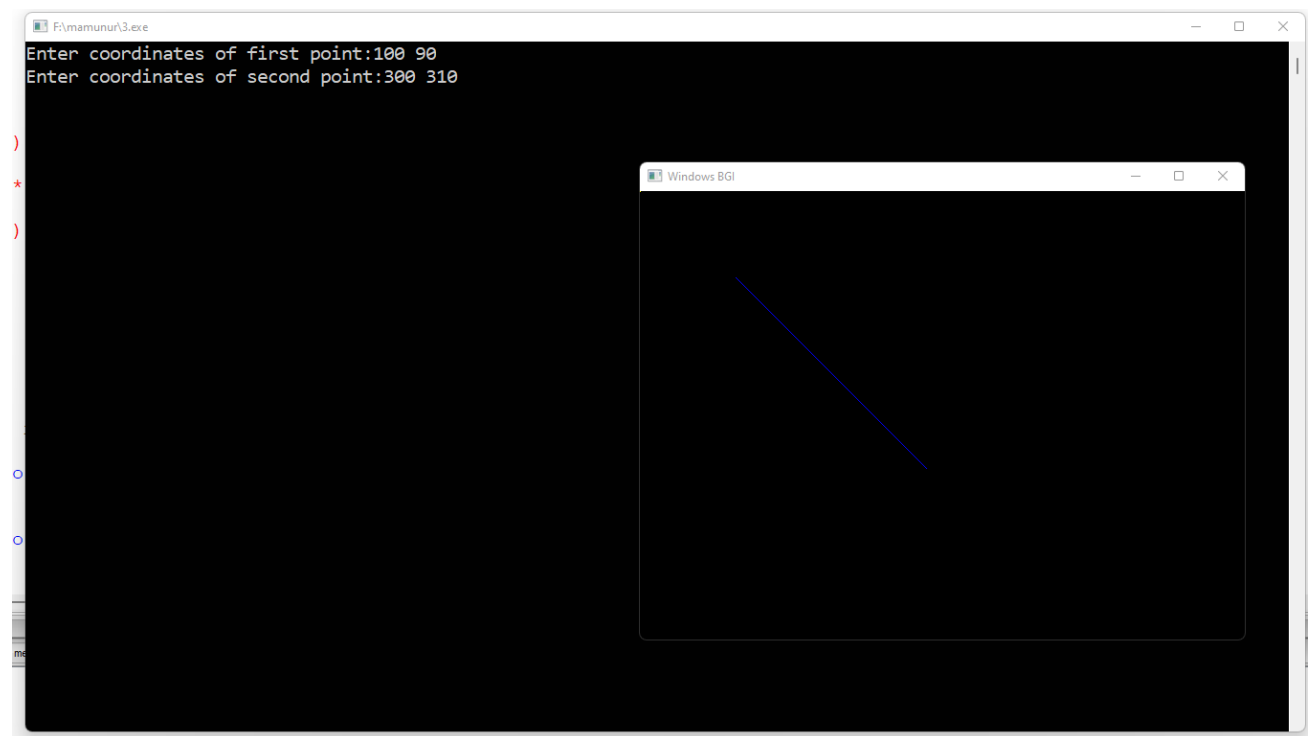
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```
    cin >> x1 >> y1;
    initgraph(&gd, &gm, "");
    drawline(x0, y0, x1, y1);

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

Screenshot:

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Scan Convert a Circle (Bresenham's Circle Algorithm):
Source Code:

```c
#include <stdio.h>
#include <dos.h>
#include <graphics.h>

void drawCircle(int xc, int yc, int x, int y)
{
    putpixel(xc+x, yc+y, RED);
    putpixel(xc-x, yc+y, RED);
    putpixel(xc+x, yc-y, RED);
    putpixel(xc-x, yc-y, RED);
    putpixel(xc+y, yc+x, RED);
    putpixel(xc-y, yc+x, RED);
    putpixel(xc+y, yc-x, RED);
    putpixel(xc-y, yc-x, RED);
}

void circleBres(int xc, int yc, int r)
{
    int x = 0, y = r;
    int d = 3 - 2 * r;
    drawCircle(xc, yc, x, y);
    while (y >= x)
    {

        x++;

        if (d > 0)
        {
            y--;
            d = d + 4 * (x - y) + 10;
        }
        else
            d = d + 4 * x + 6;
```

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```
        drawCircle(xc, yc, x, y);
        delay(50);
    }
}

int main()
{
    int xc = 200, yc = 200, r = 100;
    int gd = DETECT, gm;
    initgraph(&gd, &gm, "");
    circleBres(xc, yc, r);
    getch();
  closegraph();
    return 0;
}
```

Screenshot:

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