Name: Deepankar Sharma course: BCA-6th roll no: 2092014
Subject: Computer Graphics

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NAME- Deepankar Sharma
COURSE- BCA
ROLL NO- 2092014
SUBJECT- Computer graphics lab

PRACTICLE-1

OBJECTIVE- DRAW A SMILEY FACE THOUGH GRAPHICS

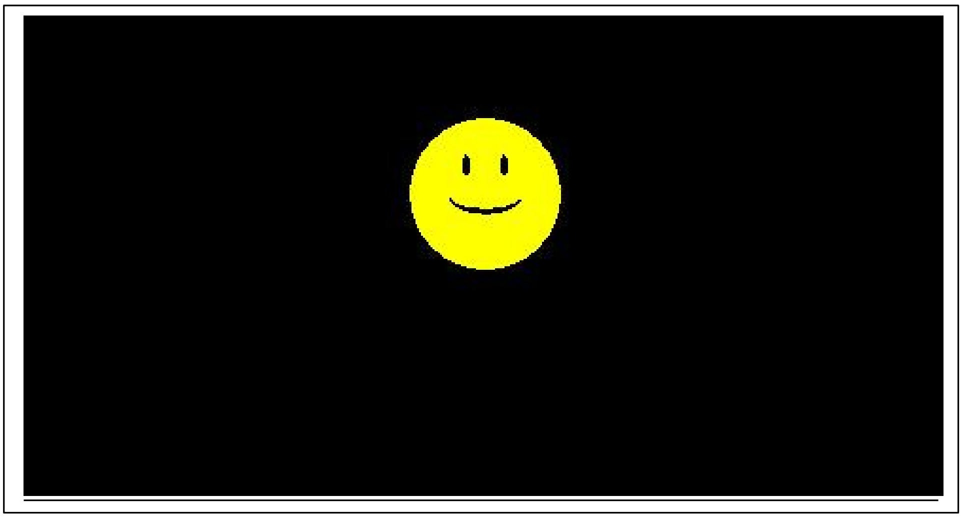
SYNTAX :-

```
#include <graphics.h>

int main()
{
    int gr = DETECT, gm;
    initgraph(&gr, &gm, "C:\\Turboc3\\BGI");
    setcolor(YELLOW);
    circle(300, 100, 40);
    setfillstyle(SOLID_FILL, YELLOW);
    floodfill(300, 100, YELLOW);
    setcolor(BLACK);
    setfillstyle(SOLID_FILL, BLACK);
    fillellipse(310, 85, 2, 6);
    fillellipse(290, 85, 2, 6);
    ellipse(300, 100, 205, 335, 20, 9);
    ellipse(300, 100, 205, 335, 20, 10);
    ellipse(300, 100, 205, 335, 20, 11);
      getch();
    closegraph();

    return 0;
}}
```

OUTPUT:



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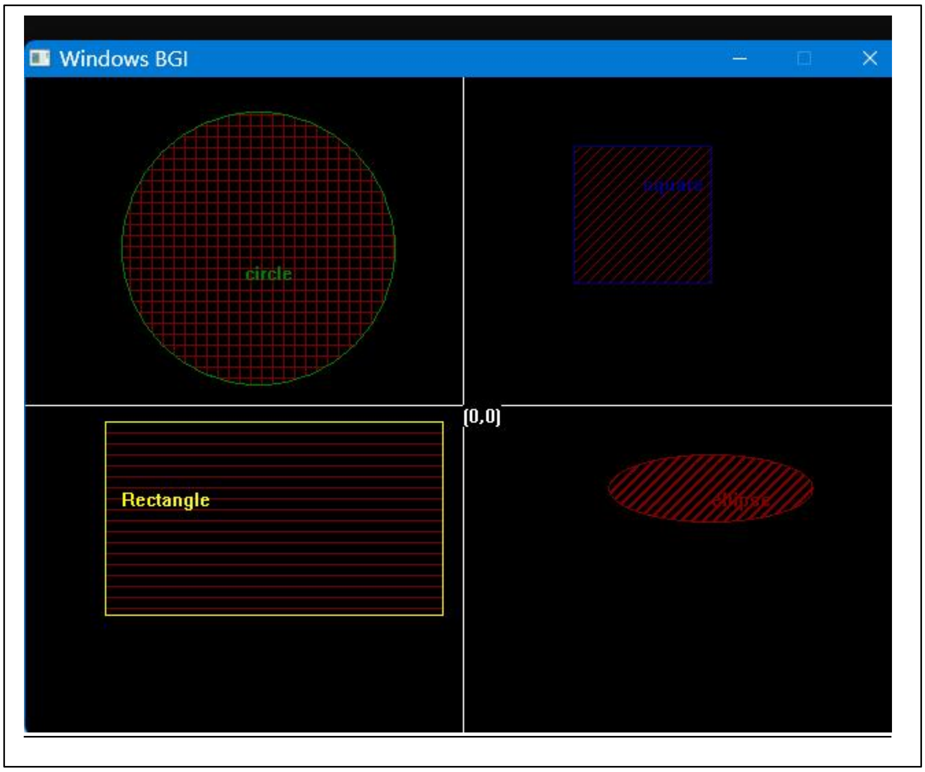
PRACTICLE-2

OBJECTIVE- To divide your screen into four region, draw circle, rectangle, ellipse ,square.

SYNTAX :-

```
#include<conio.h>
#include<graphics.h>
#include<stdio.h>
int main()
{
int gdriver = DETECT, gmode;
int xmax,ymax;
initgraph(&gdriver, &gmode,"c:\\turboc3\\bgi");
xmax = getmaxx();
ymax = getmaxy();
line(xmax/2,0,xmax/2,ymax);
line(0,ymax/2,xmax,ymax/2);
outtextxy (xmax/2,ymax/2,"(0,0)");

setcolor(GREEN);
setfillstyle(HATCH_FILL,RED);
circle(170,125,100);
outtextxy (160,135,"circle");
floodfill(170,125,GREEN);


setcolor(YELLOW);
setfillstyle(2,RED);
rectangle(58,251,304,392);
outtextxy (70,300,"Rectangle");
floodfill(70,351,YELLOW);


setcolor(BLUE);
setfillstyle(3,RED);
rectangle(400,50,500,150);
outtextxy (450,70,"square");
floodfill(450,80,BLUE);

setcolor(RED);
setfillstyle(4,RED);
ellipse(500,300,0,360,75,25);
outtextxy (500,300,"ellipse");
floodfill(500,300,RED);

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

OUTPUT:



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PRACTICLE- 3

OBJECTIVE- DRAW A HOUSE THOUGH GRAPHICS

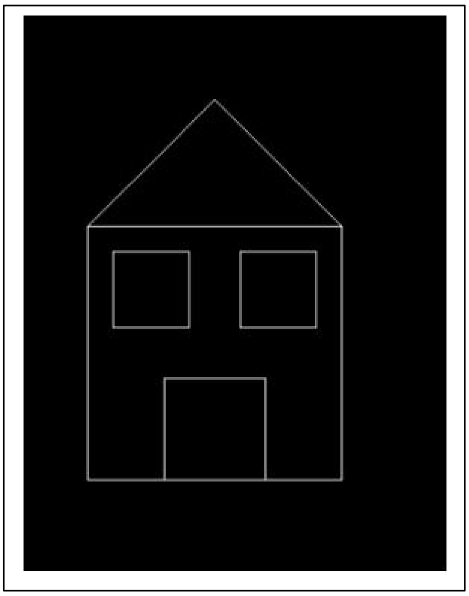
SYNTAX :-

```
#include <graphics.h>

int main() {
   int gd = DETECT, gm;
   initgraph(&gd, &gm, "");
   rectangle(100, 200, 300, 400);
   line(100, 200, 200, 100);
   line(200, 100, 300, 200);
   rectangle(120, 220, 180, 280);
   rectangle(220, 220, 280, 280);
   rectangle(160, 320, 240, 400);

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

OUTPUT:



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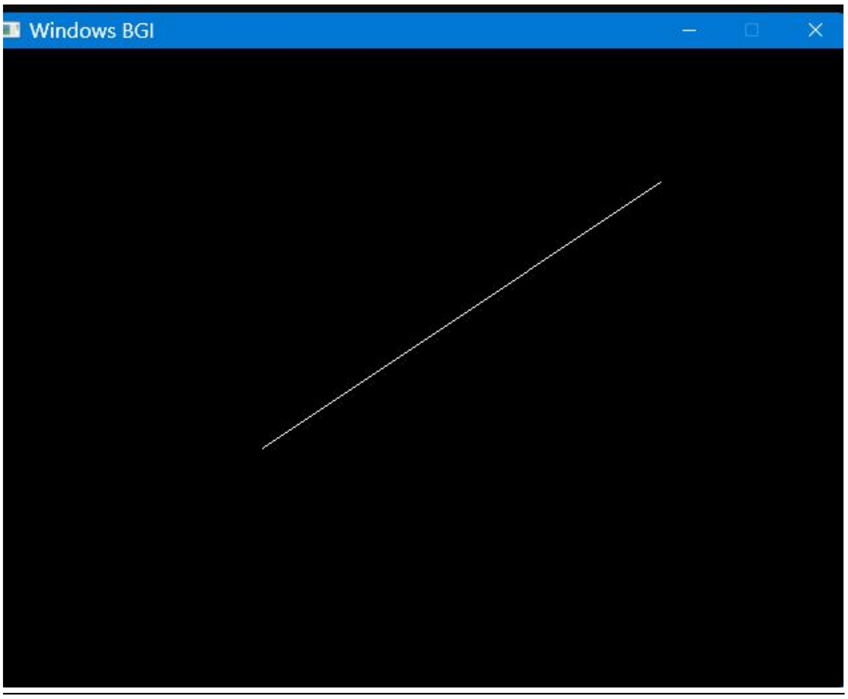
PRACTICLE-4

OBJECTIVE- TO IMPLEMENT THE DDA LINE GENERATION ALGORITHM THOUGH GRAPHICS

 SYNTAX :-

```
#include<graphics.h>
#include<conio.h>
#include<stdio.h>
int main()
{
    int gd = DETECT ,gm, i;
    float x, y,dx,dy,steps;
    int x0, x1, y0, y1;
    initgraph(&gd, &gm, "C:\\TC\\BGI");
    x0 = 200 , y0 = 300, x1 = 500, y1 = 100;
    dx = (float)(x1 - x0);
    dy = (float)(y1 - y0);
    if(dx>=dy)
          {
       steps = dx;
    }
    else
          {
       steps = dy;
    }
    dx = dx/steps;
    dy = dy/steps;
    x = x0;
    y = y0;
    i = 1;
    while(i<= steps)
    {
       putpixel(x, y, WHITE);
       x += dx;
       y += dy;
       i=i+1;
    }
    getch();
    closegraph();
}
```

OUTPUT:



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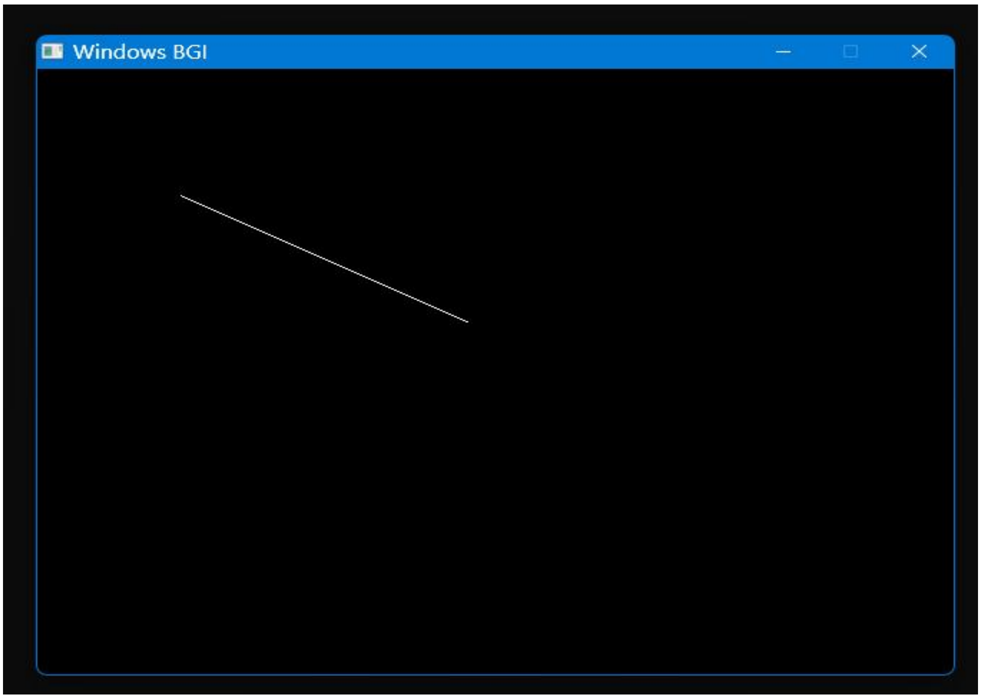
PRACTICLE-5

OBJECTIVE- TO IMPLEMENT THE Bresenham's Line Algorithm THOUGH GRAPHICS

SYNTAX :-

```
#include <iostream>
#include <graphics.h>
void bresenham(int x1, int y1, int x2, int y2) {
    int dx = x2 - x1;
    int dy = y2 - y1;
    int p = 2 * dy - dx;
    int twoDy = 2 * dy;
    int twoDyMinusDx = 2 * (dy - dx);
    int x = x1;
    int y = y1;

    if (x1 > x2) {
        x = x2;
        y = y2;
        x2 = x1;
    } else {
        x = x1;
        y = y1;
    }

    putpixel(x, y, WHITE);

    while (x < x2) {
        x++;
        if (p < 0) {
            p += twoDy;
        } else {
            y++;
            p += twoDyMinusDx;
        }
        putpixel(x, y, BLUE);
    }
}

int main() {
    int gd = DETECT, gm;
    initgraph(&gd, &gm, "");

    bresenham(100, 100, 300, 200);
    getch();
    closegraph();
}
```

OUTPUT:



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PRACTICLE-6

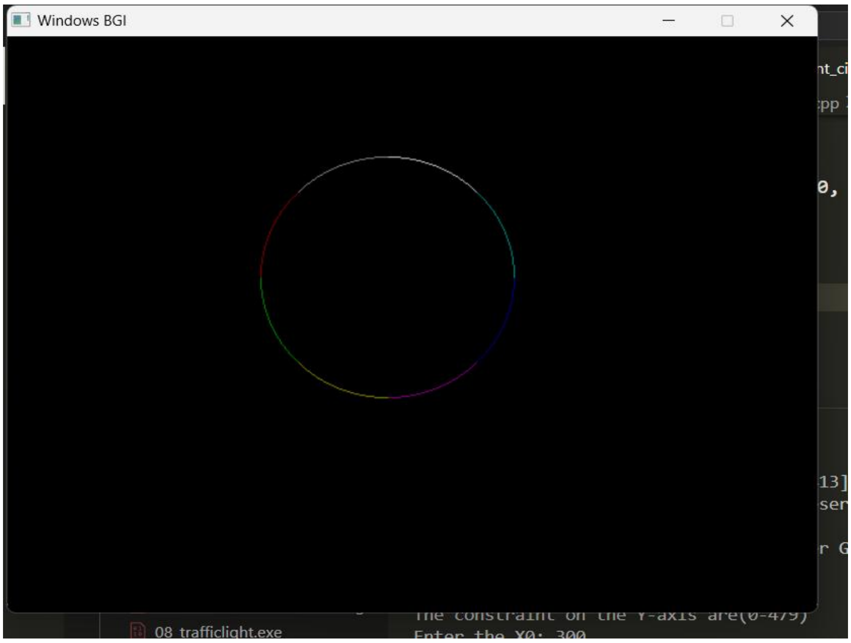
OBJECTIVE- To implement Mid Point Circle drawing Algorithm through graphics.

SYNTAX:-

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

// Midpoint Circle drawing Algorithm
void drawMidPointCircle(int x0, int y0, int radius)
{
    int x = radius, y = 0;
    int decisionParam = 1 - radius;

    while (y <= x)
    {
        putpixel(x0 + x, y0 + y, 1);
        putpixel(x0 - x, y0 + y, 2);
        putpixel(x0 + x, y0 - y, 3);
        putpixel(x0 - x, y0 - y, 4);
        putpixel(x0 + y, y0 + x, 5);
        putpixel(x0 - y, y0 + x, 6);
        putpixel(x0 + y, y0 - x, 7);
        putpixel(x0 - y, y0 - x, 8);

        y++;

        if (decisionParam <= 0)
            decisionParam += 2 * y + 1;
        else
        {
            x--;
            decisionParam += 2 * (y - x) + 1;
        }
    }
}

int main()
{
    int gDrive = DETECT;

    int gMode;
    initgraph(&gDrive, &gMode, NULL);

    int X0 = 0, Y0 = 0, radius=0 ;

    printf("The constraint on the X-axis are(0-%d)\n", getmaxx());
    printf("The constraint on the Y-axis are(0-%d)\n", getmaxy());

    cout<<("Enter the X0: ");
    scanf("%d", &X0);
    cout<<("Enter the Y0: ");
    scanf("%d", &Y0);
    cout<<("Enter the radius: ");
    scanf("%d", &radius);


    // Function call
    // DDA(X0, Y0, X1, Y1);
    drawMidPointCircle(X0, Y0, radius);
    // DDA(2, 2, 14, 16);
    getch();
    closegraph();
    return 0;
}
```

OUTPUT:-

```
The constraint on the X-axis are(0-639)
The constraint on the Y-axis are(0-479)
Enter the X0: 300
Enter the Y0: 200
Enter the radius: 100
```



```
The constraint on the Y-axis are(0-479)
Enter the X0: 300
```

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PRACTICLE-7

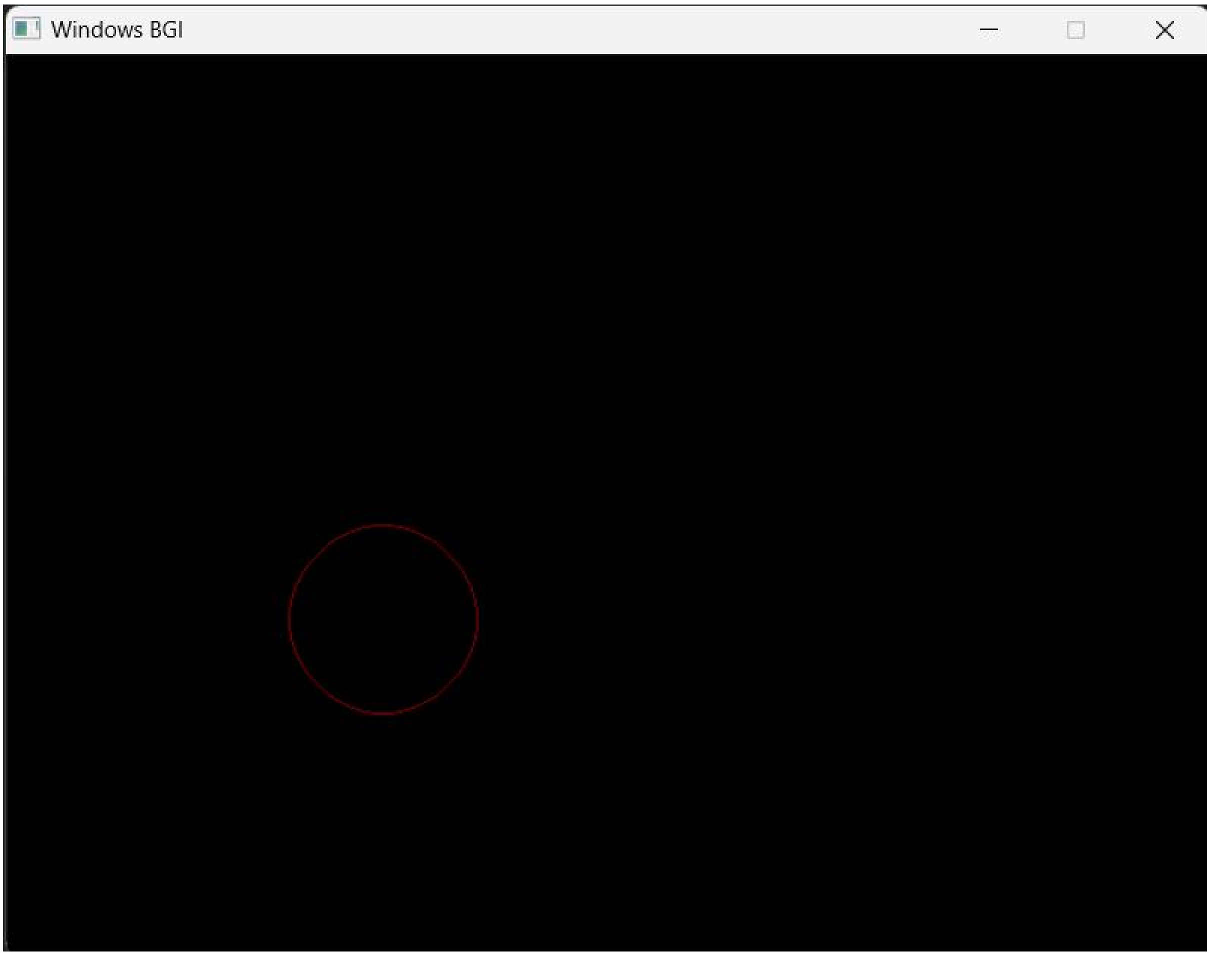
OBJECTIVE- To implement Brensanham’s Circle drawing Algorithm through graphics.

SYNTAX:-

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

// Midpoint Circle drawing Algorithm
void drawMidPointCircle(int x0, int y0, int radius)
{
    int x = radius, y = 0;
    int decisionParam = 1 - radius;

    while (y <= x)
    {
        putpixel(x0 + x, y0 + y, 1);
        putpixel(x0 - x, y0 + y, 2);
        putpixel(x0 + x, y0 - y, 3);
        putpixel(x0 - x, y0 - y, 4);
        putpixel(x0 + y, y0 + x, 5);
        putpixel(x0 - y, y0 + x, 6);
        putpixel(x0 + y, y0 - x, 7);
        putpixel(x0 - y, y0 - x, 8);

        y++;

        if (decisionParam <= 0)
            decisionParam += 2 * y + 1;
        else
        {
            x--;
            decisionParam += 2 * (y - x) + 1;
        }
    }
}

// Brensanham Circle drawing Algorithm

void drawBrensanhamCircle(int x0, int y0, int radius)
{
    int x = 0, y = radius;
    int decisionParam = 3 - 2 * radius;
    while (x <= y)
    {
        putpixel(x0 + x, y0 + y, RED);
        putpixel(x0 + y, y0 + x, RED);
        putpixel(x0 - y, y0 + x, RED);
        putpixel(x0 - x, y0 + y, RED);
        putpixel(x0 - x, y0 - y, RED);
        putpixel(x0 - y, y0 - x, RED);
        putpixel(x0 + y, y0 - x, RED);
        putpixel(x0 + x, y0 - y, RED);

        if (decisionParam <= 0)
        {
            x++;
            decisionParam += 4 * x + 6;
        }
        else
        {
            x++;
            y--;
            decisionParam += 4 * (x - y) + 10;
        }
    }
}

int main()
{
    int gDrive = DETECT;

    int gMode;

    initgraph(&gDrive, &gMode, NULL);

    int X0 = 0, Y0 = 0, radius = 0;

    printf("The constraint on the X-axis are(0-%d)\n", getmaxx());
    printf("The constraint on the Y-axis are(0-%d)\n", getmaxy());

    cout << ("Enter the X0: ");
    scanf("%d", &X0);
    cout << ("Enter the Y0: ");
    scanf("%d", &Y0);
    cout << ("Enter the radius: ");
    scanf("%d", &radius);

    // Function call
    // DDA(X0, Y0, X1, Y1);
    drawBrensanhamCircle(X0, Y0, radius);
    // DDA(2, 2, 14, 16);
    getch();
    closegraph();
    return 0;
}
```

OUTPUT:-

```
C:\Deepankar\06_semester\TBC 601 Computer
Graphics\PracticalsVScode>"c:\Deepankar\06_semester\TBC 601 Computer
Graphics\PracticalsVScode\Home\build\07_Bresenham_circleDrawing.exe"
The constraint on the X-axis are(0-639)
The constraint on the Y-axis are(0-479)
Enter the X0: 200
Enter the Y0: 300
Enter the radius: 50
```



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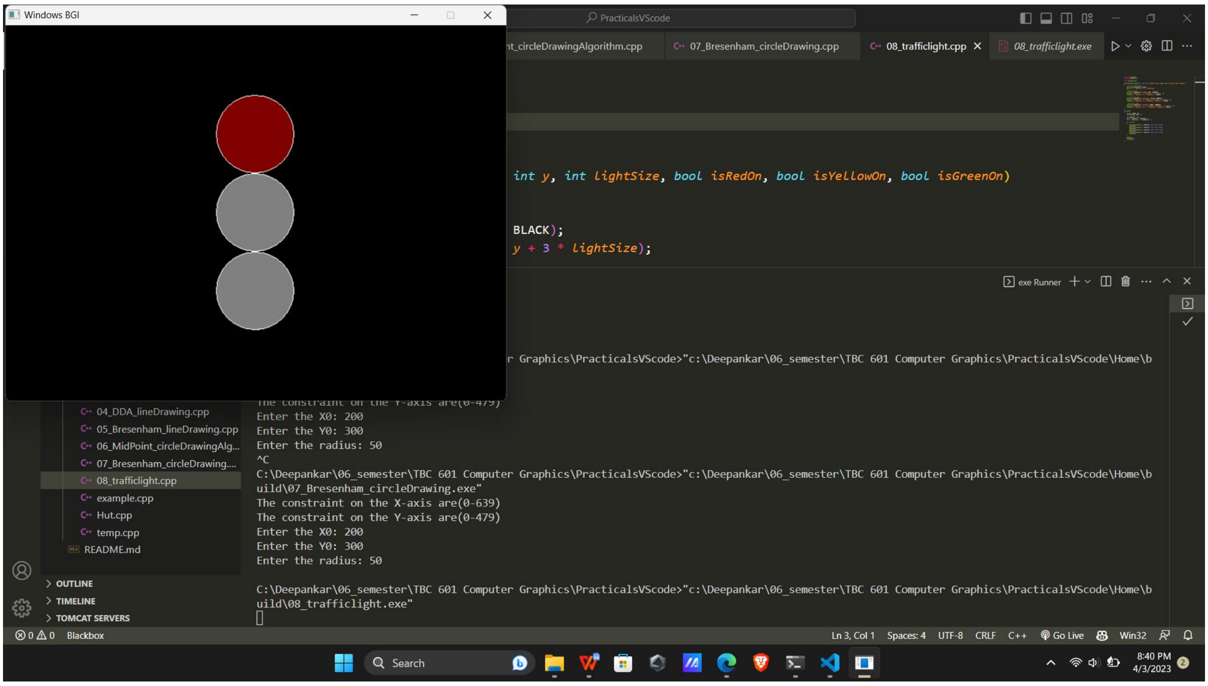
PRACTICLE-8

OBJECTIVE- To implement Blinking Traffic Light through graphics.

SYNTAX:-

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

using namespace std;

void drawTrafficLight(int x, int y, int lightSize, bool isRedOn,
bool isYellowOn, bool isGreenOn)
{
    // Draw black background
    setfillstyle(SOLID_FILL, BLACK);
    bar(x, y, x + lightSize, y + 3 * lightSize);

    // Draw red light
    setfillstyle(SOLID_FILL, isRedOn ? RED : DARKGRAY);
    circle(x + lightSize / 2, y + lightSize / 2, lightSize / 2);
    floodfill(x + lightSize / 2, y + lightSize / 2, WHITE);

    // Draw yellow light
    setfillstyle(SOLID_FILL, isYellowOn ? YELLOW : DARKGRAY);
    circle(x + lightSize / 2, y + lightSize + lightSize / 2,
lightSize / 2);
    floodfill(x + lightSize / 2, y + lightSize + lightSize / 2,
WHITE);

    // Draw green light
    setfillstyle(SOLID_FILL, isGreenOn ? GREEN : DARKGRAY);
    circle(x + lightSize / 2, y + 2 * lightSize + lightSize / 2,
lightSize / 2);
    floodfill(x + lightSize / 2, y + 2 * lightSize + lightSize / 2,
WHITE);
}

int main()
{
    int gd = DETECT, gm;
    initgraph(&gd, &gm, "");

    int lightSize = 100;
    int x = (getmaxx() - lightSize) / 2;
    int y = (getmaxy() - 3 * lightSize) / 2;

    while (true)
    {
        drawTrafficLight(x, y, lightSize, true, false, false);
        delay(400);
        drawTrafficLight(x, y, lightSize, true, true, false);
        delay(400);
        drawTrafficLight(x, y, lightSize, false, false, true);
        delay(400);
        drawTrafficLight(x, y, lightSize, false, true, false);
        delay(400);
    }
    getch();
    closegraph();
    return 0;
}
```

OUTPUT:-



```
int y, int lightSize, bool isRedOn, bool isYellowOn, bool isGreenOn)

BLACK);
y + 3 * lightSize);
```

```
r Graphics\PracticalsVScode>"c:\Deepankar\06_semester\TBC 601 Computer Graphics\PracticalsVScode\Home\b

The constraint on the Y-axis are(0-479)
Enter the X0: 200
Enter the Y0: 300
Enter the radius: 50
^C
C:\Deepankar\06_semester\TBC 601 Computer Graphics\PracticalsVScode>"c:\Deepankar\06_semester\TBC 601 Computer Graphics\PracticalsVScode\Home\b
uild\07_Bresenham_circleDrawing.exe"
The constraint on the X-axis are(0-639)
The constraint on the Y-axis are(0-479)
Enter the X0: 200
Enter the Y0: 300
Enter the radius: 50

C:\Deepankar\06_semester\TBC 601 Computer Graphics\PracticalsVScode>"c:\Deepankar\06_semester\TBC 601 Computer Graphics\PracticalsVScode\Home\b
uild\08_trafficlight.exe"
```