NAME:-Yuvraj Yadav

Roll No:-69

Subjects:-Computer Graphics and Animations

Practical - 1

Solve the following:

a). Study and enlist the basic functions used for graphics in C / C++ / Python language. Give an example for each of them.

Ans:-

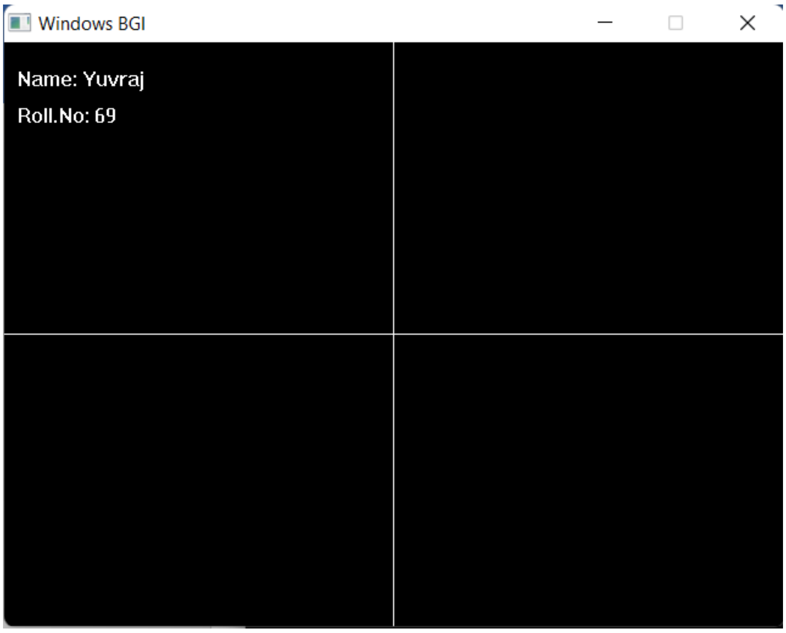
initgraph setcolor closegraph outtextxy putpixel delay	imagesize settextstyle resetendpt setfillstyle getpixel setlinestyle boudryfill

b. Draw a co-ordinate axis at the center of the screen.

Ans:-

```
#include<graphics.h>

#include<stdlib.h>

#include<stdio.h>

#include<conio.h>

int main(void)

{

        int gd = DETECT,gm;

        int xmax, ymax;

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

        setcolor(getmaxcolor());

        xmax =getmaxx();

        ymax =getmaxy();

        line(xmax/2,0,xmax/2,ymax);

        line(0,ymax/2,xmax,ymax/2);

outtextxy(10,20,"Name: Yuvraj ");

outtextxy(10,50,"Roll.No: 69 ");

        getch();

        closegraph();
        return 0;
}
```

OUTPUT: -



```
Name: Yuvraj
Roll.No: 69
```

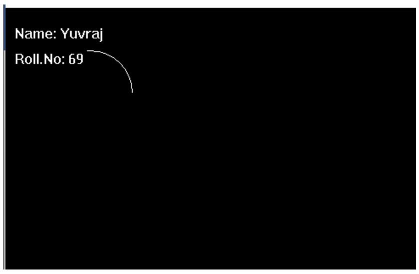
c. Study and enlist the basic functions used for graphics in C language.

i) Arc Function in C:

Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
initgraph(&gd, &gm, (char*)"");
arc(100,100,0,135,50);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
}
```

Output: -



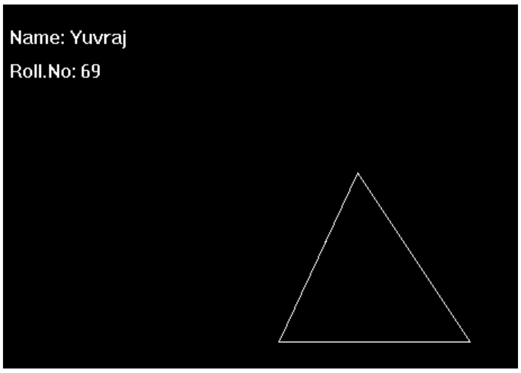
```
Name: Yuvraj
Roll.No: 69
```

ii) Drawpoly Function in C:

Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm,points[]={320,150,420,300,250,300,320,150};
initgraph(&gd,&gm,"C:\\TC\\BGI");
drawpoly(4,points);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");

getch();
closegraph();
}
```

Output: -



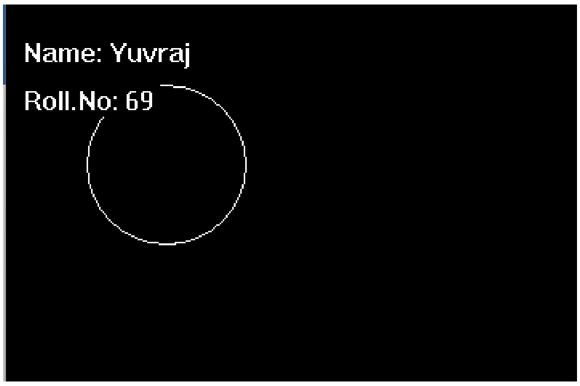
```
Name: Yuvraj
Roll.No: 69
```

iii) Circle Function in C:

Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
circle(100,100,50);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");

getch();
closegraph();
}
```

Output: -



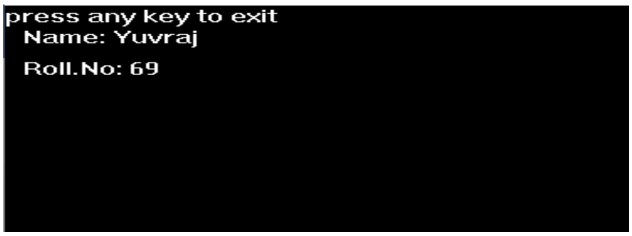
```
Name: Yuvraj
Roll.No: 69
```

iv) Cleardevice Function in C:

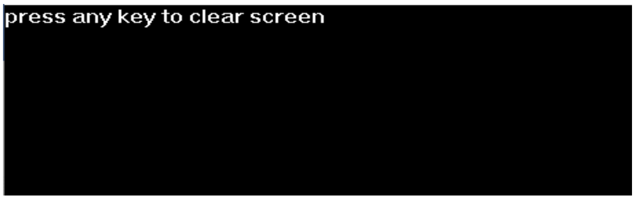
Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
outtext("press any key to clear screen");
getch();
cleardevice();
outtext("press any key to exit");
outtextxy(10,20,"Name: Haaris ");
outtextxy(10,50,"Roll.No: 04 ");
getch();
closegraph();
}
```

Output: -



```
press any key to exit
  Name: Yuvraj

  Roll.No: 69
```



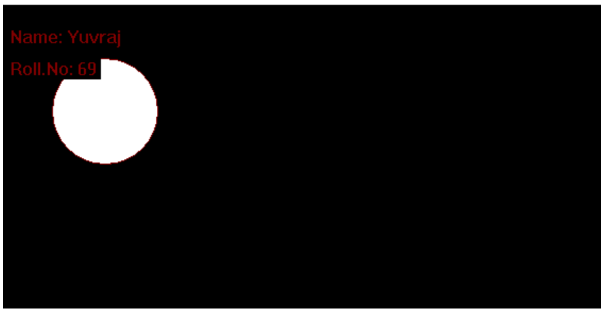
```
press any key to clear screen
```

v) Floodfill Function In C:

<u>Ans: -</u>

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
setcolor(RED);
circle(100,100,50);
floodfill(100,100,RED);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
}
```

Output: -



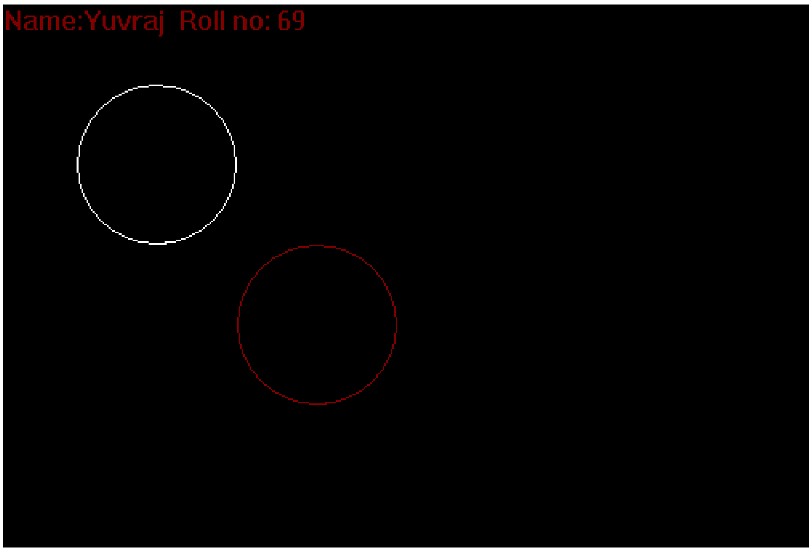
```
Name: Yuvraj
Roll.No: 69
```

vi) Setcolor Function C:

Ans: -

```
#include<graphics.h>

#include<conio.h>

int main()

{

int gd=DETECT,gm;

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

circle(100,100,50);

setcolor(RED);

circle(200,200,50);

outtext(" Name:Yuvraj ");

outtext(" Roll no:69 ");

getch();

closegraph();

}
```

Output: -



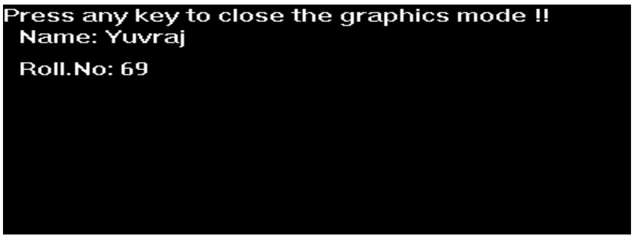
```
Name:Yuvraj  Roll no: 69
```

vii) Drawpoly Function in C:

Ans: -

```
#include <graphics.h>
int main()
{

    int gd = DETECT, gm;



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



    outtext("Press any key to close"
           " the graphics mode !!");
 outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69");

    getch();
    closegraph();

    return 0;
}
```

Output: -



```
Press any key to close the graphics mode !!
  Name: Yuvraj

  Roll.No: 69
```

Practical – 2

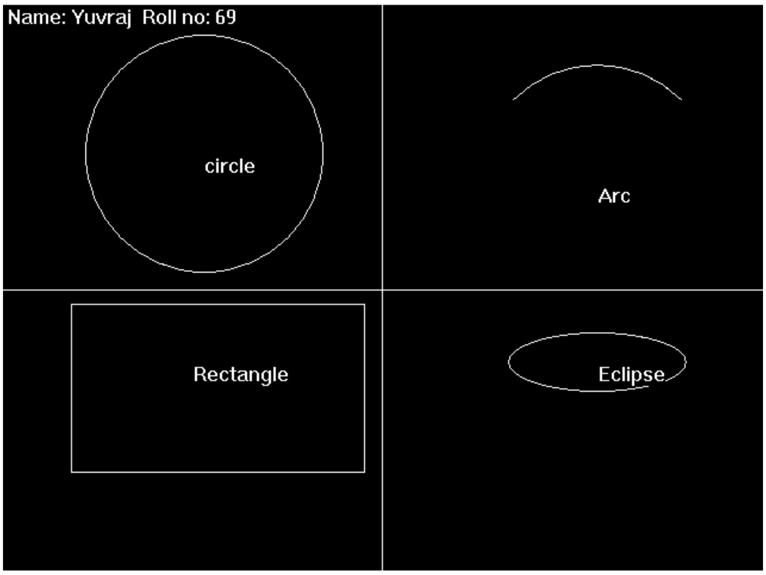
Solve the following:

a. Divide your screen into four region, draw circle, rectangle, ellipse and half ellipse in each region with appropriate message.

Ans: -

```
#include<graphics.h>

#include<stdlib.h>

#include<stdio.h>

#include<conio.h>

int main(void){

        int gdriver = DETECT, gmode;

        int xmax,ymax;

        initgraph(&gdriver,&gmode,(char*)"");

        setcolor(getmaxcolor());

        xmax = getmaxx();

        ymax = getmaxy();

        line(xmax/2,0,xmax/2,ymax);

        line(0,ymax/2,xmax,ymax/2);

   outtext(" Name: Yuvraj ");

   outtext(" Roll no: 69 ");

        circle(170,125,100);

        outtextxy(170,125,"circle");

        rectangle(58,251,304,392);

        outtextxy(160,300, "Rectangle");

        arc(500,150,45,135,100);

        outtextxy(500,150, "Arc");

        ellipse(500,300,0,360,75,25);

        outtextxy(500,300,"Eclipse");

        getch();

        closegraph;

        return 0;
}
```

Output: -



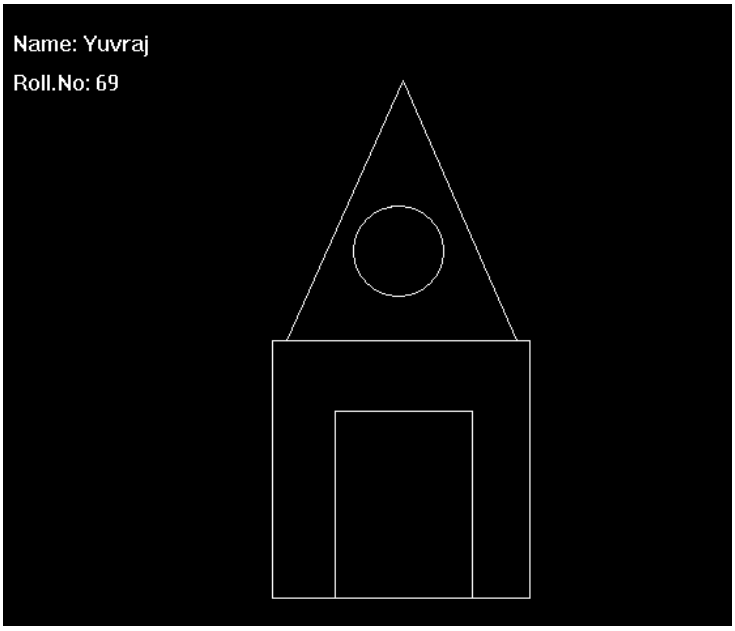
b. Draw a Simple hut on the screen.

Ans: -

```
#include<graphics.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>
int main(void){
        int gdriver = DETECT, gmode;
        initgraph(&gdriver,&gmode, "c:\\turboc3\\bgi");
        setcolor(getmaxcolor());
        rectangle(209,257,406,454);
        rectangle(257,311,362,454);
        line(309,58,220,257);
        line(309,58,396,257);
        circle(306,189,35);
        outtextxy(10,20,"Name: Yuvraj ");
       outtextxy(10,50,"Roll.No: 69 ");
       getch();
```

```
        closegraph;
        return 0;
}
```

Output: -

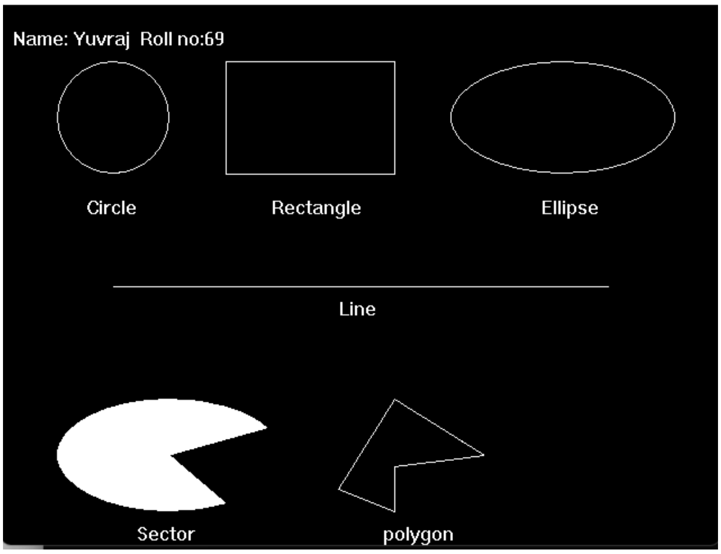

Name: Yuvraj
Roll.No: 69

c. To draw circle, rectangle, ellipse, sector and polygon on a screen.

Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
int poly[12]={350,450,350,410,430,400,350,350,300,430,350,450};
initgraph(&gd,&gm,"C:\\TC\\BGI");
circle(100,100,50);
outtextxy(75,170,"Circle");
rectangle(200,50,350,150);
outtextxy(240,170,"Rectangle");
ellipse(500,100,0,360,100,50);
outtextxy(480,170,"Ellipse");
line(100,250,540,250);
outtextxy(300,260,"Line");
sector(150,400,30,300,100,50);
outtextxy(120,460,"Sector");
drawpoly(6,poly);
outtextxy(340,460,"polygon");
outtextxy(10,20,"Name: Yuvraj \n Roll no:69");
getch();
closegraph();
}
```

Output: -

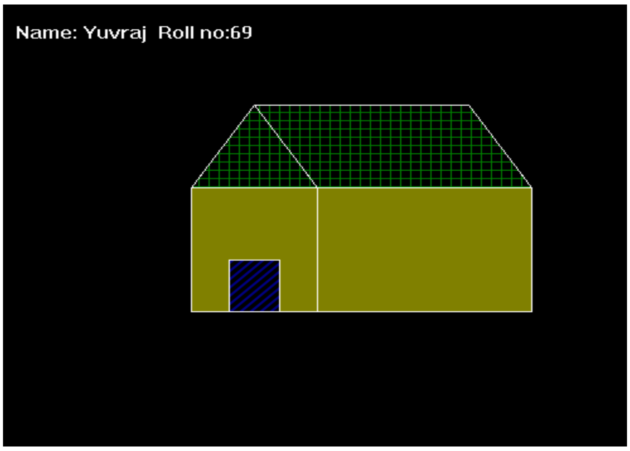


d. Draw a simple hut on the screen.

Ans: -

```
#include<graphics.h>
#include<conio.h>
int main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
setcolor(WHITE);
rectangle(150,180,250,300);
rectangle(250,180,420,300);
rectangle(180,250,220,300);
line(200,100,150,180);
line(200,100,250,180);
line(200,100,370,100);
line(370,100,420,180);
setfillstyle(SOLID_FILL,BROWN);
floodfill(152,182,WHITE);
floodfill(252,182,WHITE);
setfillstyle(SLASH_FILL,BLUE);
floodfill(182,252,WHITE);
setfillstyle(HATCH_FILL,GREEN);
floodfill(200,105,WHITE);
floodfill(210,105,WHITE);
outtextxy(10,20,"Name: Yuvraj \n Roll no:69");
getch();
closegraph();
}
```

Output: -



```
Name: Yuvraj  Roll no:69
```

Practical-3

Solve the following:

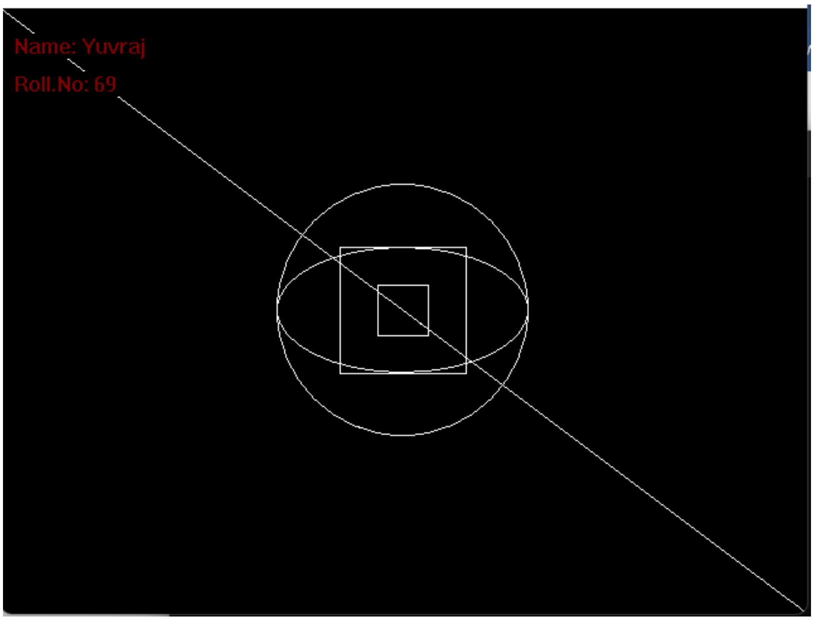
a) Draw the following basic shapes in the center of the screen:

i. Circle ii. Rectangle iii. Square iv. Concentric Circles v. Ellipse vi. Line

Ans:-

```
#include<graphics.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>
int main(void)
{
        int gd = DETECT,gm;
        int midx, midy,left,top,right,bottom;
        int radius=100;
        initgraph(&gd,&gm,"C:\\TC\\BGI");
        printf("%d", getmaxx());
        midx = getmaxx() / 2;
        midy = getmaxy() / 2;

        setcolor(getcolor());

        circle(midx, midy, radius);
        getch;
        left = getmaxx()/2-50;
        top = getmaxy()/2-50;
        right = getmaxx()/2+50;
        bottom = getmaxy()/2+50;

        rectangle(left,top,right,bottom);

        rectangle(midx-20, midy-20,midx+20, midy+20);


        ellipse(midx, midy,0,360,100,50);


        line(0,0,midx * 2, midy * 2);

        setcolor(RED);
        outtext("Name: Yuvraj ");
         outtext(”Roll.No: 69 “);

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

Output-



Practical-4

Solve the following:

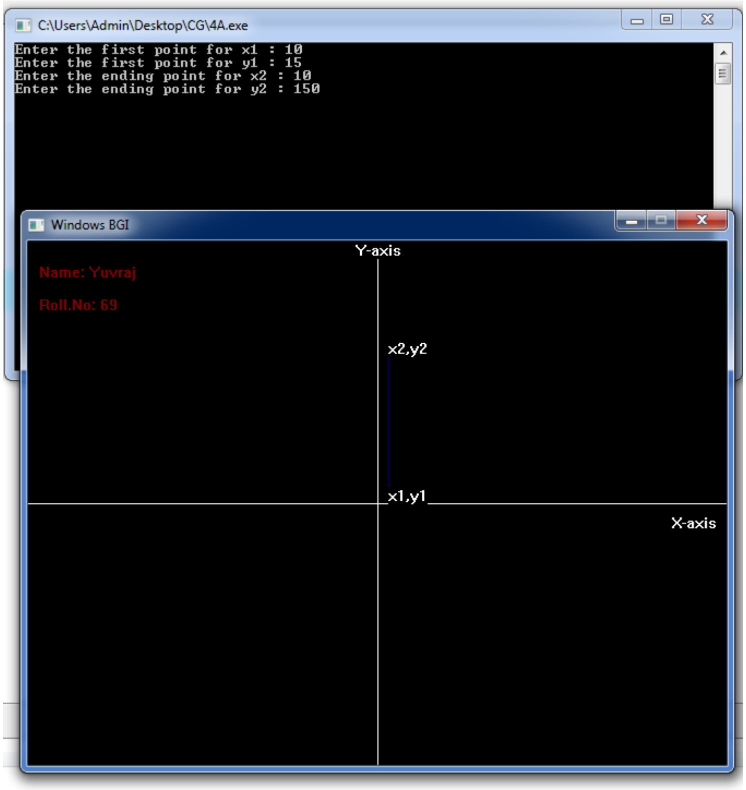
a. Develop the program for DDA Line drawing algorithm.

Ans:-

```
#include<graphics.h>
#include<stdlib.h>
#include <stdio.h>
#include<conio.h>
#include<dos.h>
#include<math.h>
void ddaline(int x1, int y1, int x2, int y2);
int main(void)
{
int x1,x2,y1,y2;
int gd = DETECT,gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
printf("Enter the first point for x1 : ");
scanf("%d",&x1);
printf("Enter the first point for y1 : ");
scanf("%d",&y1);
printf("Enter the ending point for x2 : ");
scanf("%d",&x2);
printf("Enter the ending point for y2 : ");
scanf("%d",&y2);
line(0,240,640,240);
line(320,0,320,480);
outtextxy(590,250,"X-axis");
outtextxy(300,0,"Y-axis");
ddaline(x1,y1,x2,y2);
setcolor(RED);
```

```
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
return 0;
}
void ddaline(int x1,int y1,int x2,int y2)
{
int dx,dy,step,k;
float xinc,yinc,x,y;
dx = x2-x1;
dy = y2-y1;
if(abs(dx)>=abs(dy))
step = abs(dx);
else
step =abs(dy);
xinc = dx/step;
yinc = dy/step;
x = x1;
y = y1;
putpixel(ceil(x) + 320, 240 - ceil(y), 1);
outtextxy(320+x,240-y,"x1,y1");
for(k=1; k<=step; k++)
{
xinc = dx/step;
yinc = dy/step;
x = x1;
y = y1;
putpixel(ceil(x) + 320, 240 - ceil(y), 1);
outtextxy(320+x,240-y,"x1,y1");
for(k=1; k<=step; k++)
{
x = x+xinc;
y = y+yinc;
delay(100);
putpixel(320 + ceil(x), 240 - ceil(y), 1);
}
outtextxy(320 + x, 240 - y,"x2,y2");
}
}
```

Output-



```
Enter the first point for x1 : 10
Enter the first point for y1 : 15
Enter the ending point for x2 : 10
Enter the ending point for y2 : 150
```

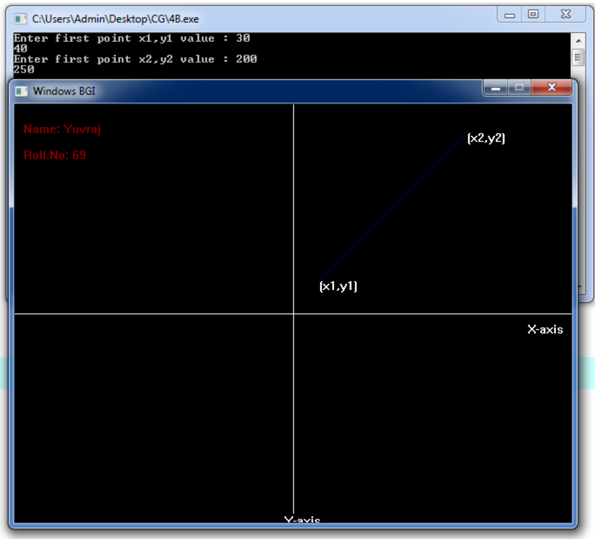
b. Develop the program for the mid-point ellipse drawing algorithm.

Ans:-

```
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
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,7);
y=y+1;
p=p+2*dy-2*dx;
}
else
{
putpixel(x,y,7);
p=p+2*dy;
}
x=x+1;
} }
int main()
{
```

```
int gd=DETECT,gm,error,x0,y0,x1,y1;
initgraph(&gd,&gm,"C:\\TC\\BGI");
printf("enter cordinate of first point");
scanf("%d%d",&x0,&y0);
printf("enter cordinate of second point");
scanf("%d%d",&x1,&y1);
drawline(x0,y0,x1,y1);
setcolor(RED);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
return 0;
}
```

Output-



C:\Users\Admin\Desktop\CG\4B.exe

```
Enter first point x1,y1 value : 30
40
Enter first point x2,y2 value : 200
250
```

Practical-5

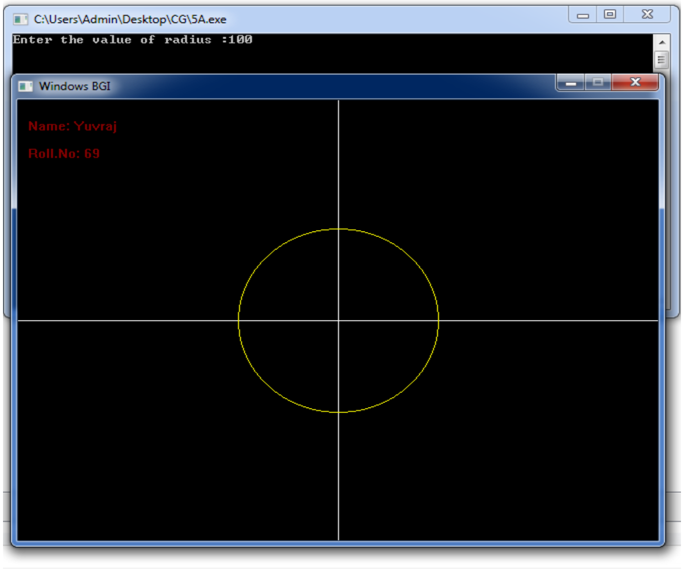
Solve the following:

a. Develop the program for the mid-point circle drawing algorithm.

Ans: -

```
#include<math.h>
#include<graphics.h>
#include<stdlib.h>
int main()
{
int xk,yk,x0,y0,xc,yc,r,pk;
int gd = DETECT, gm;
initgraph(&gd,&gm,"C:\\TC\\BGI");
printf("Enter the value of radius :");
scanf("%d",&r);
line(320,0,320,640);
line(0,240,640,240);
xk=0;
yk=r;
xc=320;
yc=240;
pk=1-r;
while(xk<yk)
{
putpixel(xk+xc, yk+yc,YELLOW);
putpixel(yk+xc, xk+yc,YELLOW);
putpixel(xk+xc, -yk+yc,YELLOW);
putpixel(yk+xc, -xk+yc,YELLOW);
putpixel(-xk+xc, -yk+yc,YELLOW);
putpixel(-yk+xc, -xk+yc,YELLOW);
putpixel(-xk+xc, yk+yc,YELLOW);
putpixel(-yk+xc, xk+yc,YELLOW);
if(pk<0)
{
xk=xk+1;
yk=yk;
pk=pk+2*(xk)+1;
}
else
{
xk=xk+1;
yk=yk-1;
pk=pk+2*(xk)+1-2*(yk);
}
delay(100);
}
setcolor(RED);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
return 0;
}
```

Output:-



```
Enter the value of radius :100
```

```
Name: Yuvraj
Roll.No: 69
```

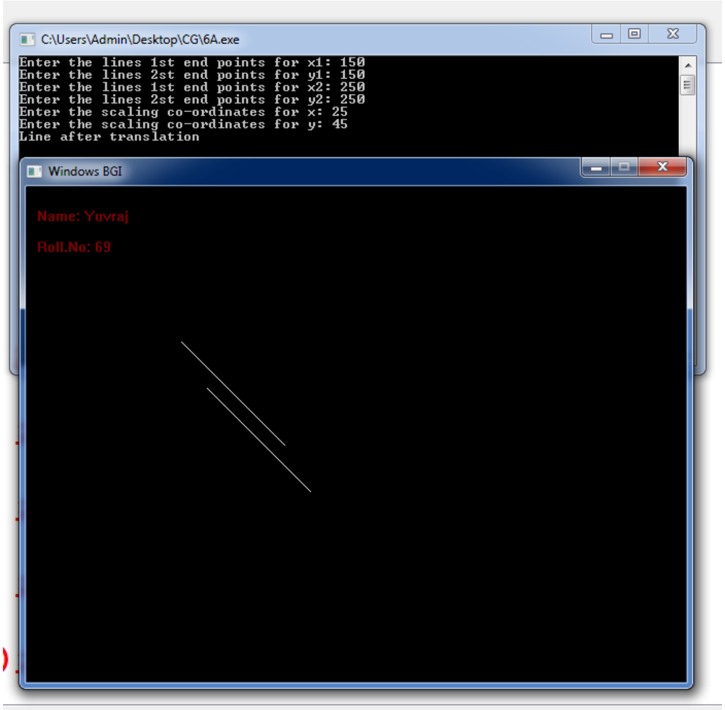
Practical-6(A)

Write a program to perform 2D translation**.**

Ans:-

```
#include<graphics.h>
#include<stdio.h>
#include<conio.h>
int main()
{
int graphdriver=DETECT,graphicmode;
int x1,y1,x2,y2,x,y,x3,y3,x4,y4;
printf("Enter the lines 1st end points for x1: ") ;
scanf("%d",&x1);
printf("Enter the lines 2st end points for y1: ") ;
scanf("%d",&y1);
printf("Enter the lines 1st end points for x2: ") ;
scanf("%d",&x2);
printf("Enter the lines 2st end points for y2: ") ;
scanf("%d",&y2);
initgraph(&graphdriver,&graphicmode,"C:\\TC\\BGI");
line(x1,y1,x2,y2) ;
printf("Enter the scaling co-ordinates for x: ");
scanf("%d",&x);
printf("Enter the scaling co-ordinates for y: ");
scanf("%d",&y);
x3=x1+x;
y3=y1+y;
x4=x2+x;
y4=y2+y;
printf("Line after translation");
line(x3,y3,x4,y4) ;

setcolor(RED);

outtextxy(10,20,"Name: Yuvraj ");

outtextxy(10,50,"Roll.No: 69 ");

getch();

closegraph();

return 0;

}
```

Output:-



```
Enter the lines 1st end points for x1: 150
Enter the lines 2st end points for y1: 150
Enter the lines 1st end points for x2: 250
Enter the lines 2st end points for y2: 250
Enter the scaling co-ordinates for x: 25
Enter the scaling co-ordinates for y: 45
Line after translation
```

```
Name: Yuvraj

Roll.No: 69
```

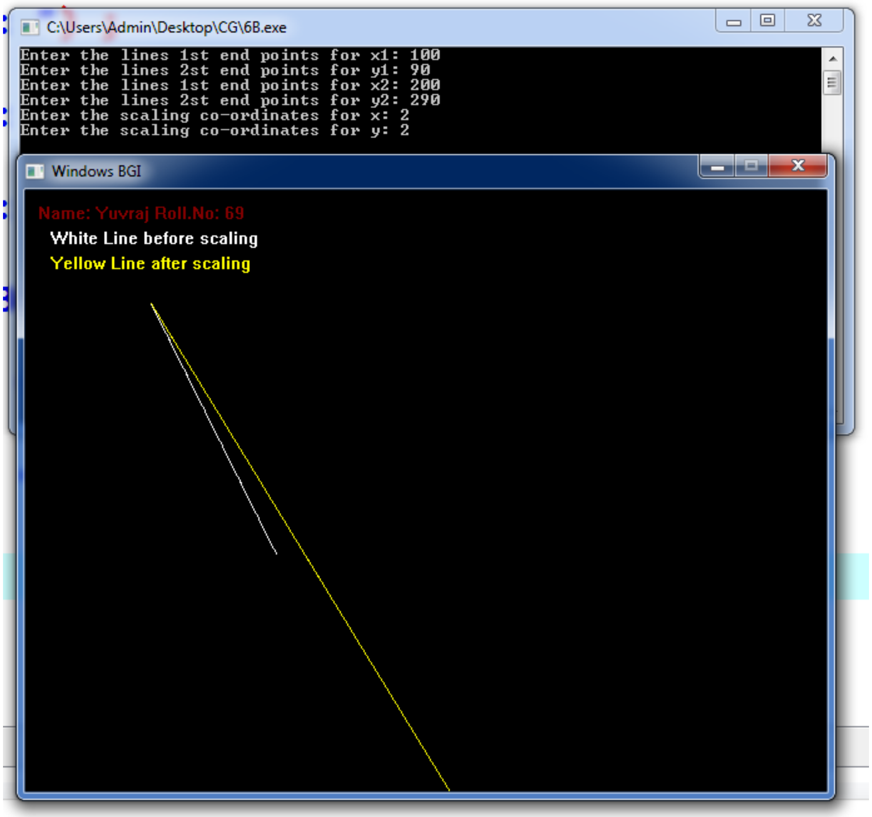
Practical-6(B)

Write a program to implement 2D scaling**.**

Ans:-

```
#include<graphics.h>
#include<stdio.h>
#include<conio.h>
void main()
{
int graphdriver=DETECT,graphicmode;
int x1,y1,x2,y2,x,y,x3,y3,x4,y4;
printf("Enter the 2 lines end points:") ;
printf("x1,y1,x2,y2");
scanf("%d%d%d%d",&x1,&y1,&x2,&y2);
initgraph(&graphdriver,&graphicmode,"C:\\TC\\BGI");
line(x1,y1,x2,y2) ;
printf("enter the scaling co-ordinates:");
scanf("%d%d",&x,&y);
x3=x1*x;
y3=y1*y;
//x4=x2*x;
//y4=y2*y;
printf("Line after scaling");
line(x1,y1,x4,y4) ;

            outtext("Name: Yuvraj ");
              outtext(”Roll.No: 69 “);

getch();
closegraph();
}
```

Output:-



```
Enter the lines 1st end points for x1: 100
Enter the lines 2st end points for y1: 90
Enter the lines 1st end points for x2: 200
Enter the lines 2st end points for y2: 290
Enter the scaling co-ordinates for x: 2
Enter the scaling co-ordinates for y: 2
```

```
Name: Yuvraj Roll.No: 69
White Line before scaling
Yellow Line after scaling
```

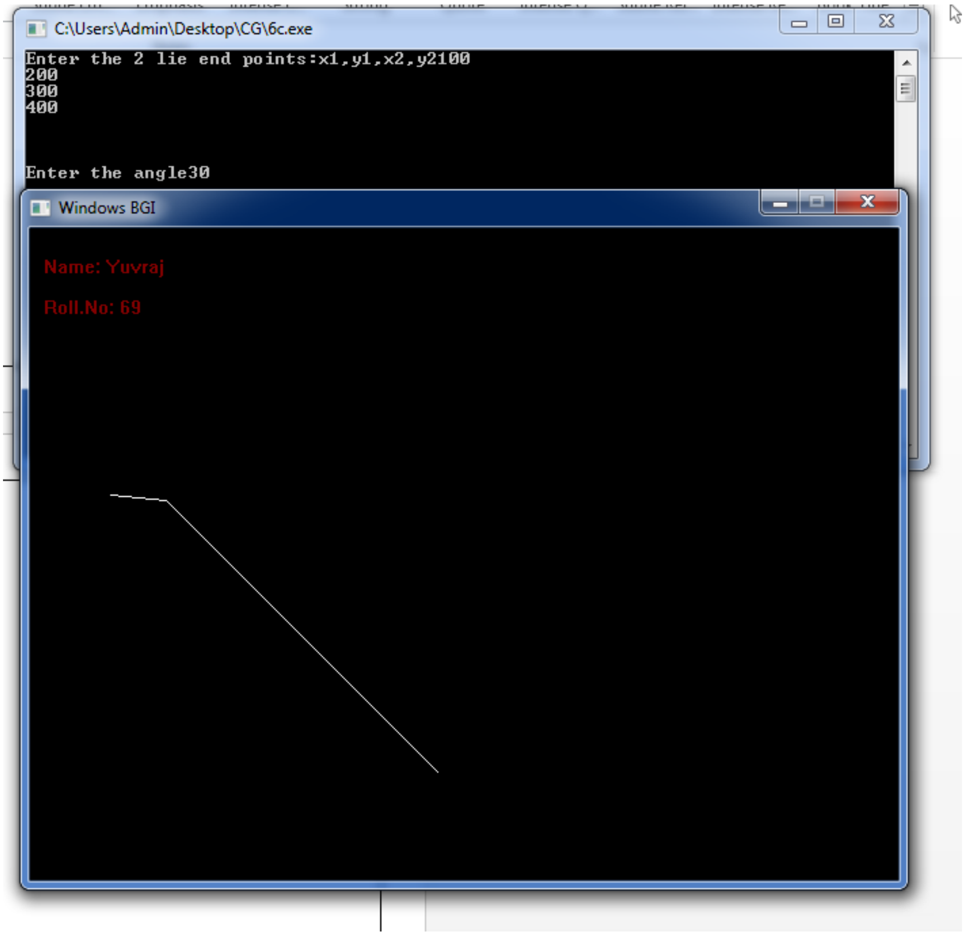
Practical-6(C)

Perform 2D Rotation on a given object**.**

Ans:-

```
#include<graphics.h>
#include<stdlib.h>
#include<stdio.h>
#include<math.h>
#include<conio.h>
int main()
{
int graphdriver = DETECT,graphmode;
int i;
int x2,y2,x1,y1,x,y,xn,yn;
double r11,r12,r21,r22,th;
printf("Enter the 2 lie end points:");
printf("x1,y1,x2,y2");
scanf("%d%d%d%d",&x1,&y1,&x2,&y2);
initgraph(&graphdriver,&graphmode,"C:\\TC\\BGI");
line(x1,y1,x2,y2);
printf("\n\n\nEnter the angle");
scanf("%lf",&th);
r11=cos((th*3.1428)/180);
r12=sin((th*3.1428)/180);
r21=(-sin((th*3.1428)/180));
r22=cos((th*3.1428)/180);
xn=((x2*r11)-(y2*r12));
yn=((x2*r21)+(y2*r22));
line(x1,y1,xn,yn);
setcolor(RED);
outtextxy(10,20,"Name: Yuvraj ");
outtextxy(10,50,"Roll.No: 69 ");
getch();
closegraph();
return 0;
}
```

Output: -



```
Enter the 2 lie end points:x1,y1,x2,y2100
200
300
400


Enter the angle30
```

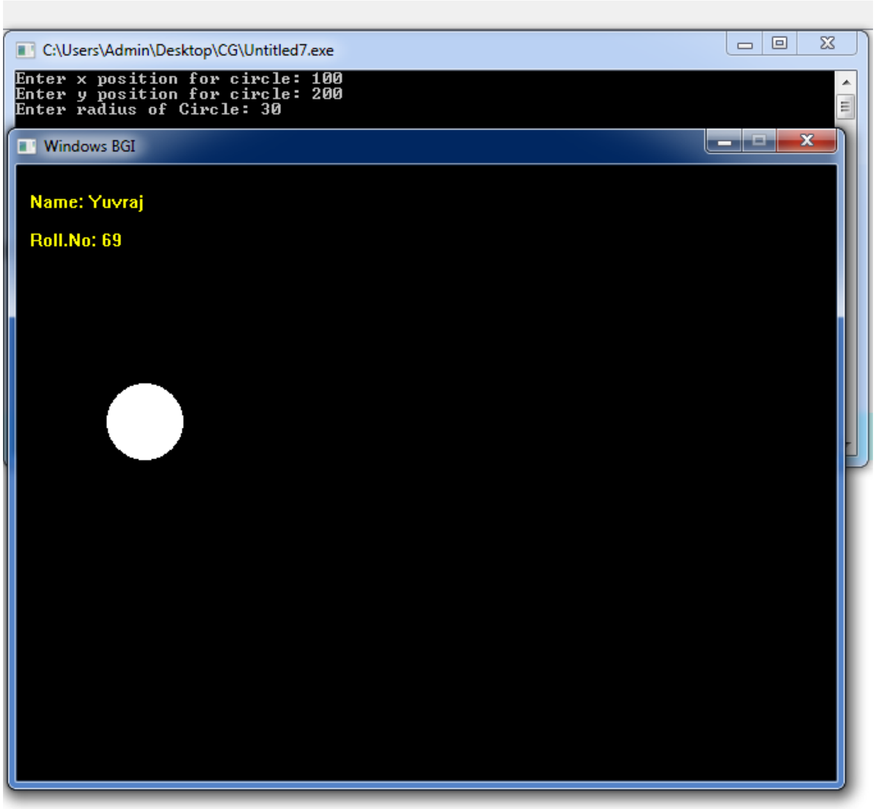
```
Name: Yuvraj

Roll.No: 69
```

Practical-7(A)

Write a program to fill a circle using Flood Fill Algorithm.

```
#include<graphics.h>

#include<stdio.h>

#include<conio.h>

#include<dos.h>

void floodfill(int x,int y,int oldcolor,int newcolor)

{

if(getpixel(x,y)==oldcolor)

{

delay(10);

putpixel(x,y,newcolor);

floodfill(x+1,y,oldcolor,newcolor);

floodfill(x,y+1,oldcolor,newcolor);

floodfill(x-1,y,oldcolor,newcolor);

floodfill(x,y-1,oldcolor,newcolor);

}

}

int main()

{

int gd=DETECT,gm,radius;

int x, y;

printf("Enter x position for circle: ");

scanf("%d",&x);

printf("Enter y position for circle: ");

scanf("%d",&y);

printf("Enter radius of Circle: ");

scanf("%d",&radius);

initgraph(&gd,&gm,"c:\\TC\\BGI");
circle(x,y,radius);

floodfill(x,y,0,15);

setcolor(YELLOW);

outtextxy(10,20,"Name: Yuvraj ");

outtextxy(10,50,"Roll.No: 69 ");

getch();

closegraph();

return 0;

}
```

Output:



```
Enter x position for circle: 100
Enter y position for circle: 200
Enter radius of Circle: 30
```

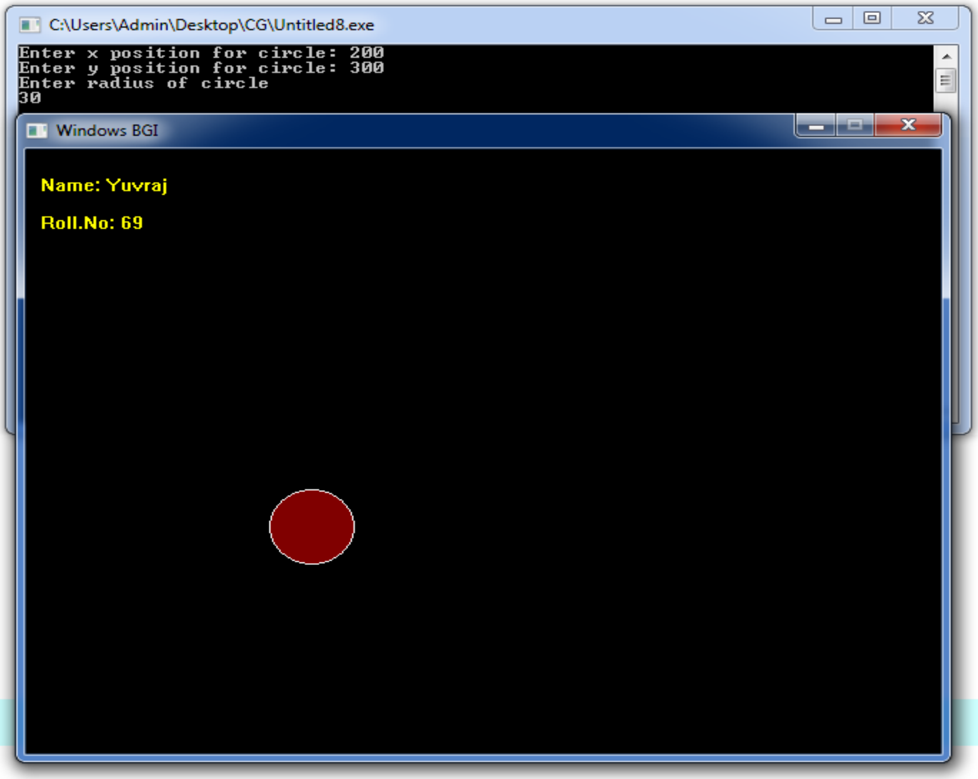
```
Name: Yuvraj

Roll.No: 69
```

Practical-7(B)

Write a program to fill a circle using Boundary Fill Algorithm.

```
#include<graphics.h>
#include<dos.h>
#include<conio.h>
void boundaryfill(int x ,int y,int f_color,int b_color)
{
if(getpixel(x,y)!=b_color && getpixel(x,y)!=f_color)
{
delay(10);
putpixel(x,y,f_color);
boundaryfill(x+1,y,f_color,b_color);
boundaryfill(x,y+1,f_color,b_color);
boundaryfill(x-1,y,f_color,b_color);
boundaryfill(x,y-1,f_color,b_color);
}
}
int main()
{
int gd=DETECT,gm,radius;
int x,y;
printf("Enter x position for circle: ");
scanf("%d",&x);
printf("Enter y position for circle: ");
scanf("%d",&y);
printf("Enter radius of circle\n");
scanf("%d",&radius);
initgraph(&gd,&gm,"c:\\TC\\BGI");
circle(x,y,radius);
boundaryfill(x,y,4,15);

setcolor(YELLOW);

outtextxy(10,20,"Name: Yuvraj ");

outtextxy(10,50,"Roll.No: 69 ");

getch();

closegraph();

return 0;

}
```

Output:



```
Enter x position for circle: 200
Enter y position for circle: 300
Enter radius of circle
30
```

```
Name: Yuvraj

Roll.No: 69
```