আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম
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LAB - 4

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Course Code : CSE-4742

Course Title : Computer Graphics Lab

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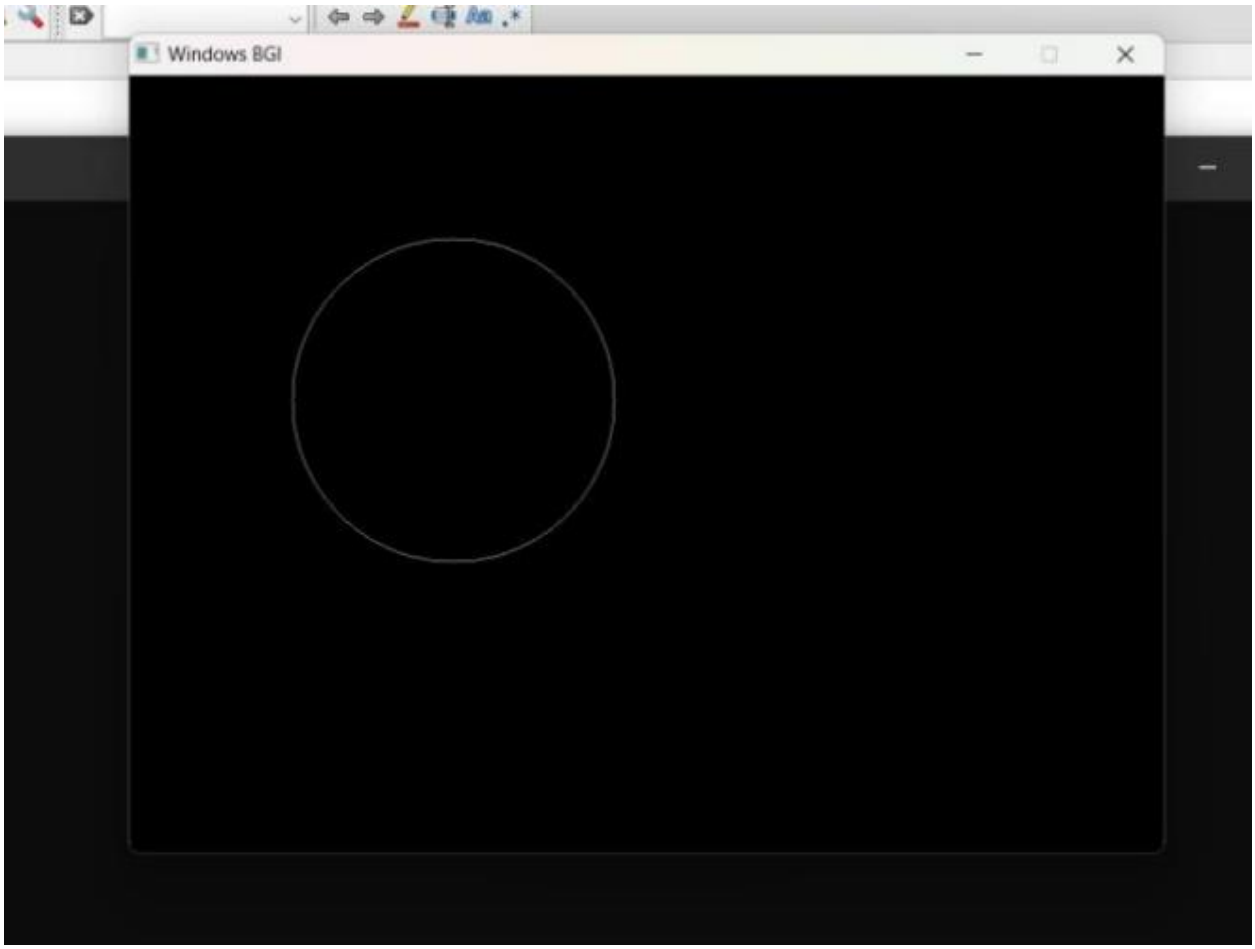
1. **Draw a Circle using polynomial method**

```
#include<graphics.h>
#include<conio.h>
#include<math.h>
void setPixel(int x, int y, int h, int k)
{
   putpixel(x+h, y+k, RED);
   putpixel(x+h, -y+k, RED);
   putpixel(-x+h, -y+k, RED);
   putpixel(-x+h, y+k, RED);
   putpixel(y+h, x+k, RED);
   putpixel(y+h, -x+k, RED);
   putpixel(-y+h, -x+k, RED);
   putpixel(-y+h, x+k, RED);
}
main()
{
   int gd=0, gm,h,k,r;
   double x,y,x2;
   h=200, k=200, r=100;
   initgraph(&gd, &gm, "C:\\TC\\BGI ");
   setbkcolor(WHITE);
   x=0,y=r;
   x2 = r/sqrt(2);
   while(x<=x2)
   {
      y = sqrt(r*r - x*x);
      setPixel(floor(x), floor(y), h,k);
      x += 1;
   }
```

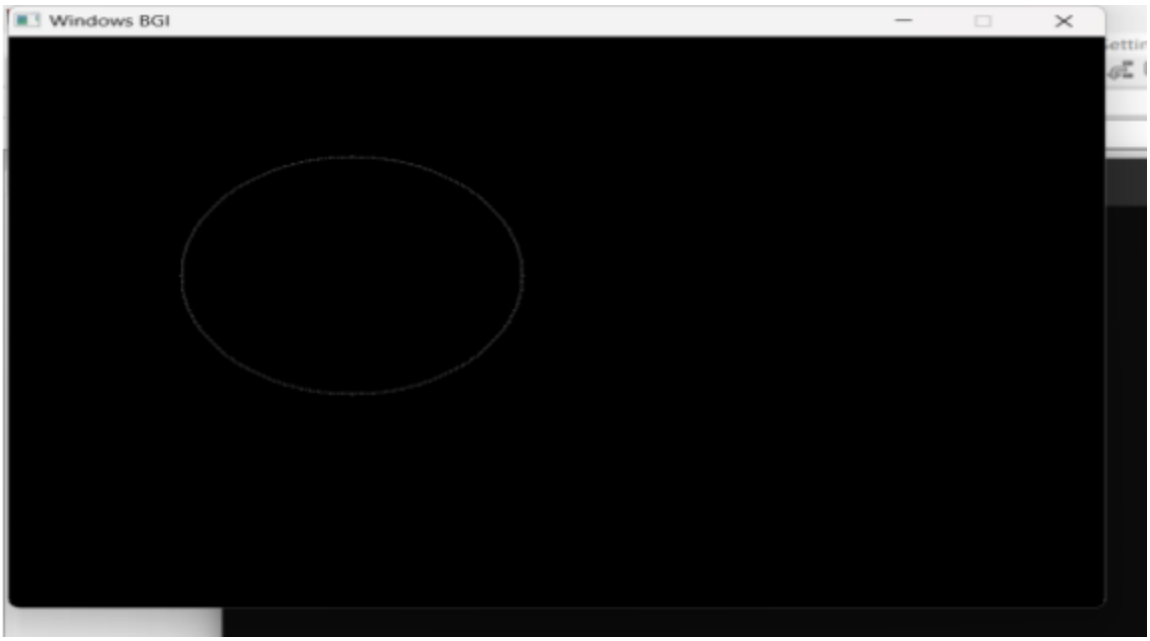
```
    getch();
    closegraph();
    return 0;
}
```



2. **Draw a Circle using Trigonometric method**

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
void plot8pixel(int x,int y,int h,int k)
{
    putpixel(x+h,y+k,8);
    putpixel(x+h,-y+k,8);
    putpixel(-x+h,y+k,8);
    putpixel(-x+h,-y+k,8);
```

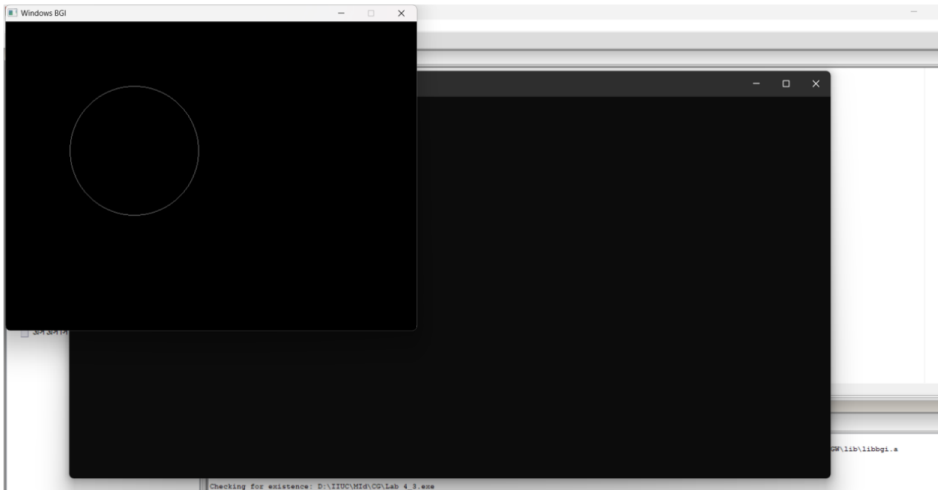
```
    putpixel(y+h,x+k,8);
    putpixel(y+h,-x+k,8);
    putpixel(-y+h,x+k,8);
    putpixel(-y+h,-x+k,8);
}
int main()
{
    int gd=DETECT,gm;
    initgraph(&gd,&gm,"");
    setbkcolor(WHITE);
    int x,y,x1,y1,r,h,k,theta;
    float n=3.14159/180;
    h=200;k=200;r=100;
    for(theta=0; theta<=45; theta++)
    {
        x1=r*cos(theta*n);
        y1=r*sin(theta*n);
        x=int(x1+0.5);
        y=int(y1+0.5);
        plot8pixel(x,y,h,k);
    }
    getch();
    closegraph();
}
```



3. **Draw a Circle using using Bresenham's Algorithm**

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
void plot8pixel(int x,int y,int h,int k)
{
   putpixel(x+h,y+k,8);
   putpixel(x+h,-y+k,8);
   putpixel(-x+h,y+k,8);
   putpixel(-x+h,-y+k,8);
   putpixel(y+h,x+k,8);
   putpixel(y+h,-x+k,8);
   putpixel(-y+h,x+k,8);
   putpixel(-y+h,-x+k,8);
}
int main()
{
   int gd=DETECT,gm;
   initgraph(&gd,&gm,"");
```

```
    setbkcolor(WHITE);
     int x,y,r,d,h,k,theta;
    h=200;
    k=200;
    r=100;
    x=0;
    y=r;
    d=3-(2*r);
    while(x<=y)
    {
       plot8pixel(x,y,h,k);
       if(d<0) d=d+(4*x)+6;
       else
       {
          d=d+(4*(x-y))+10;
          y--;
       }
       x++;
    }
    getch();
    closegraph();
}
```



4. **Draw a Circle using Midpoint Algorithm**

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
 void plot8pixel(int x,int y,int h,int k)
{
   putpixel(x+h,y+k,8);
   putpixel(x+h,-y+k,8);
   putpixel(-x+h,y+k,8);
   putpixel(-x+h,-y+k,8);
   putpixel(y+h,x+k,8);
   putpixel(y+h,-x+k,8);
   putpixel(-y+h,x+k,8);
   putpixel(-y+h,-x+k,8);
}
int main()
{
   int gd=DETECT,gm;
   initgraph(&gd,&gm,"");
   setbkcolor(WHITE);
   int x,y,r,d,h,k,theta;
   h=200;
   k=200;
   r=100;
   x=0;
   y=r;
   d=3-(2*r);
   while(x<=y)
   {
      plot8pixel(x,y,h,k);
```

```
        if(d<0) d=d+(2*x)+3;
        else
        {
           d=d+(2*(x-y))+5;
           y--;
        }
        x++;
    }
    getch();
    closegraph();
}
```