আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম
الجامعة الإسلامية العالمية شيتاغونغ
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Department of Computer Science & Engineering(CSE)

Lab -04

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Course Code : CSE-4742

Course Title : Computer Graphics Lab

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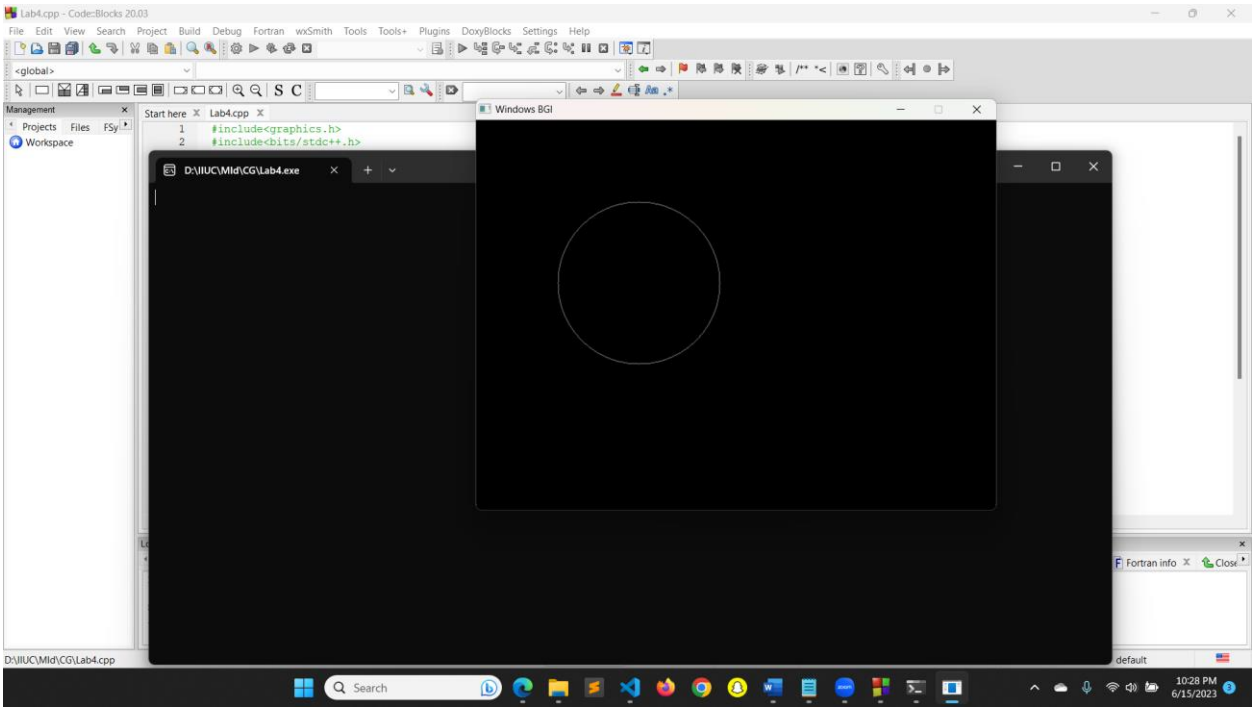
1. **Draw a Circle using polynomial method**.

Code:.

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
void plot8pixel(int,int,int,int);

void circle_polynomial()
{
   int x,y,r,h,k;
   h=200;
   k=200;
   r=100;
   x=0;
   y=r;

   while(x<=y)
   {
      plot8pixel(x,y,h,k);
      x++;
      y=sqrt((r*r)-(x*x));
   }
   setcolor(8);
}

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

   circle_polynomial();

   getch();
   closegraph();
```

```
}
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);
}
```

Output:

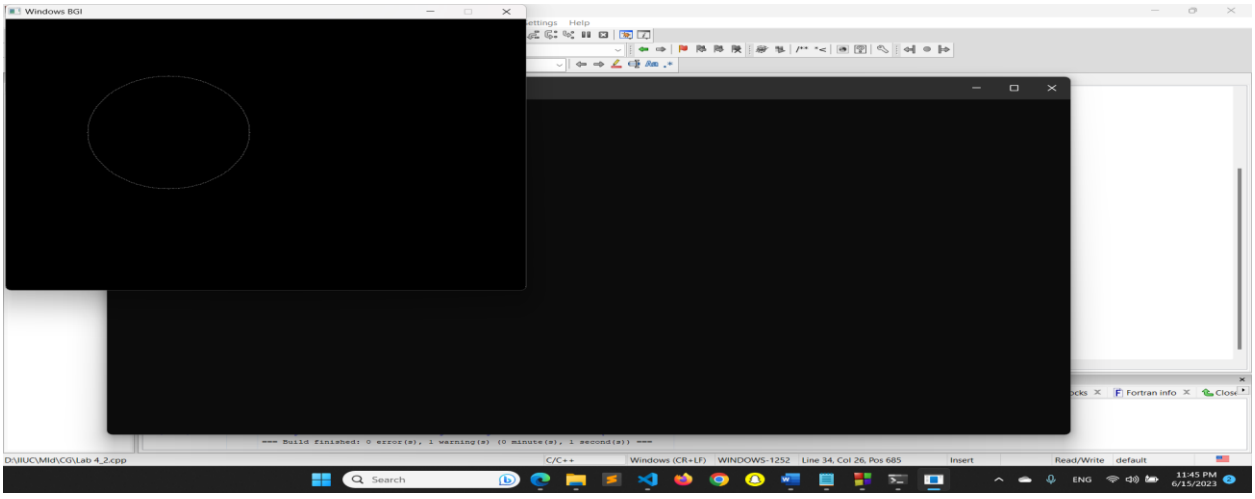


2. **Draw a Circle using Trigonometric method.**

Code:

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
void plot8pixel(int,int,int,int);

void circle_trigonometric()
{
```

```
    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);
    }
}

int main()
{
    int gd=DETECT,gm;
    initgraph(&gd,&gm,"");
    setbkcolor(WHITE);
    circle_trigonometric();
    getch();
    closegraph();
}
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);
}
```

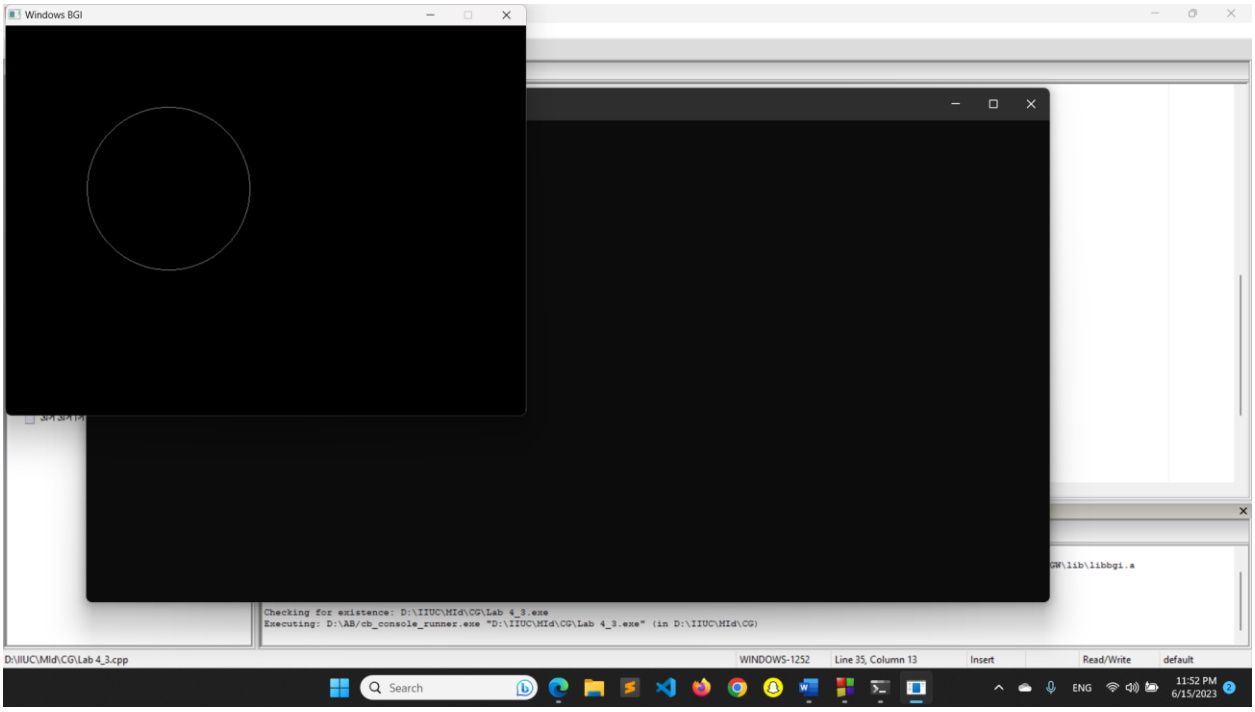


3. Draw a Circle using using Bresenham's Algorithm.

Code:

```
#include<graphics.h>
#include<bits/stdc++.h>
#include<math.h>
void plot8pixel(int,int,int,int);

void circle_Bresenhams()
{
   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++;
   }
}

int main()
{
   int gd=DETECT,gm;
   initgraph(&gd,&gm,"");
   setbkcolor(WHITE);
   circle_Bresenhams();
```

```
    setpixel(100,100);
    getch();
    closegraph();
}
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);
}
```



4. <u>Draw a Circle using Midpoint Algorithm</u>.

Code: #include<graphics.h>

#include<bits/stdc++.h>

#include<math.h>

void plot8pixel(int,int,int,int);

```
void circle_Midpoint()
{
   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++;
   }
}

int main()
{
   int gd=DETECT,gm;
   initgraph(&gd,&gm,"");
   setbkcolor(WHITE);
   circle_Midpoint();
   getch();
   closegraph();
}
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);
}
```