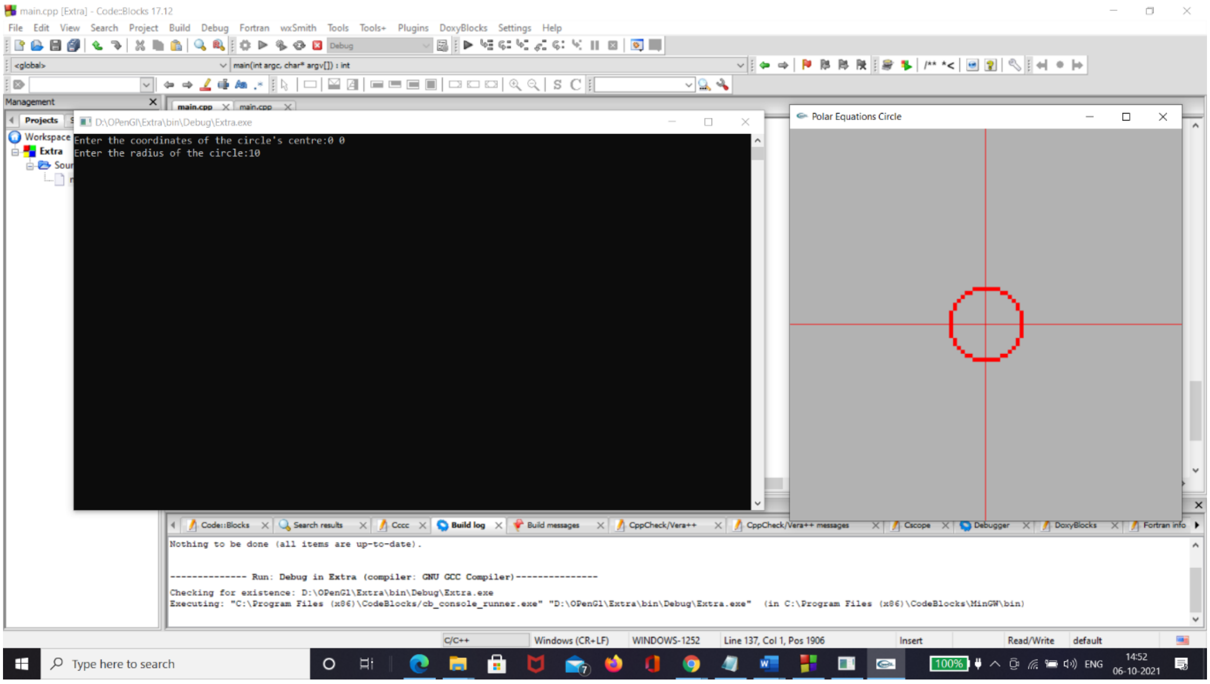
Rohan Nyati
500075940
R177219148
B-5 AI&ML SEM-5

Experiment-3

Polar Equations Circle

```
#include<windows.h>

#include<GL\glew.h>

#include<GL\glut.h>

#include <stdio.h>

#include <stdlib.h>

#include<math.h>




int xc, yc, r;

void putpixel(int x, int y)

{

    glPointSize(5.0);

    glColor3f(1.0, 0.0, 0.0);

    glBegin(GL_POINTS);

    glVertex2i(xc + x, yc + y);

    glVertex2i(xc + x, yc - y);

    glVertex2i(xc + y, yc + x);

    glVertex2i(xc + y, yc - x);
    glVertex2i(xc - x, yc - y);

    glVertex2i(xc - y, yc - x);

    glVertex2i(xc - x, yc + y);

    glVertex2i(xc - y, yc + x);

    glEnd();

}

void display()

{

    float x, y;

    x = 0, y = r;

    float theta = 0;

    float inc = (float)1 / r;


    glColor3f(1.0, 0.0, 0.0);  //Quadrant Plot Graph

    glBegin(GL_LINES);

    glVertex2i(-50, 0);

    glVertex2i(50, 0);

    glVertex2i(0, -50);

    glVertex2i(0, 50);

    glEnd();

    float end = 3.14 / 4;

    float C = cos(inc);

    float S = sin(inc);

    while (theta <= end)
    {
        float xtemp = x;
        x = x * C - y * S;
        y = y * C + xtemp * S;

        putpixel(x, y);
        theta = theta + inc;
    }
    glFlush();
}
void init()
{
    glClearColor(0.7, 0.7, 0.7, 0.7);
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(-50, 50, -50, 50);
}
int main(int argc, char* argv[]) {
    printf("Enter the coordinates of the circle's centre:");
    scanf("%d  %d",&xc,&yc);
    printf("Enter the radius of the circle:");
    scanf("%d",&r);
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_RGB | GLUT_SINGLE);
    glutInitWindowSize(500, 500);

    glutInitWindowPosition(200, 100);

    glutCreateWindow("Polar Equations Circle");

    init();

    glutDisplayFunc(display);

    glutMainLoop();

}
```



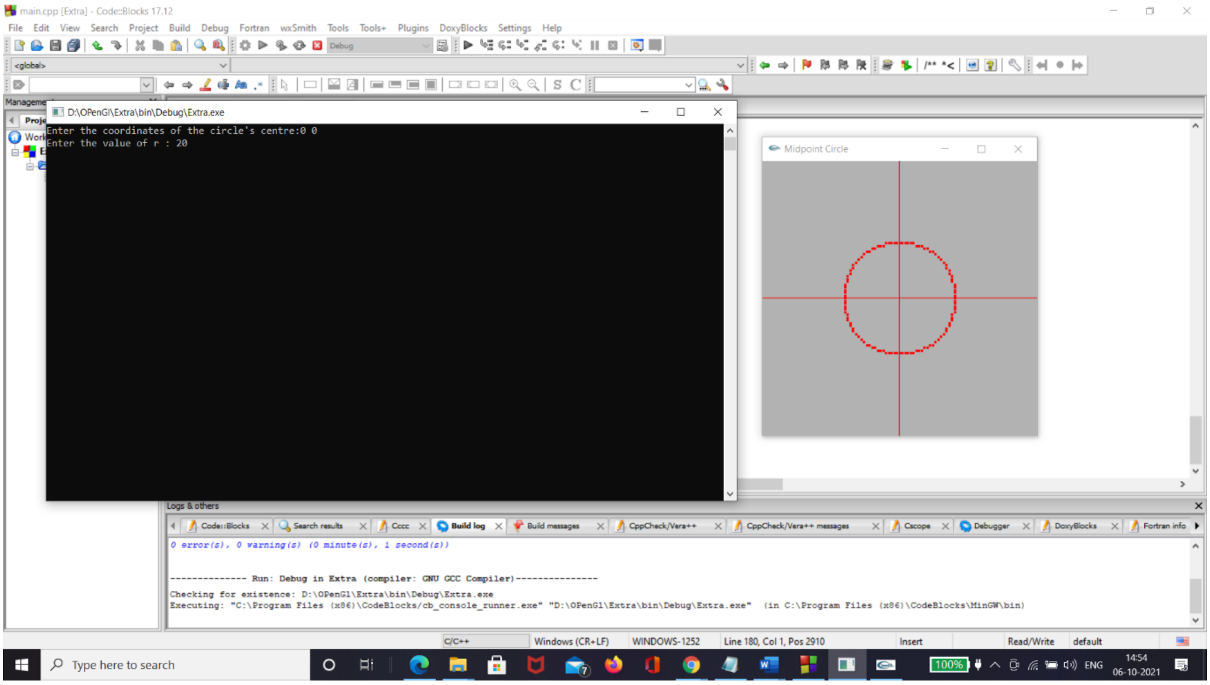
```
Enter the coordinates of the circle's centre:0 0
Enter the radius of the circle:10
```

```
Nothing to be done (all items are up-to-date).


-------------- Run: Debug in Extra (compiler: GNU GCC Compiler)---------------

Checking for existence: D:\OPenGl\Extra\bin\Debug\Extra.exe
Executing: "C:\Program Files (x86)\CodeBlocks/cb_console_runner.exe" "D:\OPenGl\Extra\bin\Debug\Extra.exe"  (in C:\Program Files (x86)\CodeBlocks\MinGW\bin)
```

Midpoint Circle

```
#include<windows.h>

#include<GL\glu.h>

#include<GL\glut.h>

#include <stdio.h>

#include <stdlib.h>
```

```
int  x,y,r,xc,yc;



void display()

{

    glColor3f(1.0, 0.0, 0.0);  //Quadrant Plot Graph

    glBegin(GL_LINES);

    glVertex2i(-50, 0);

    glVertex2i(50, 0);

    glVertex2i(0, -50);

    glVertex2i(0, 50);

    glEnd();
    glPointSize(3.0);

    glColor3f(1.0, 0.0, 0.0);

    glBegin(GL_POINTS);
    int d[r];
    d[0]=1-r;
    x=0,y=0;
    y=r;
    if(d[0]<=0)
    {

        glVertex2i(xc + x, yc + y);

        glVertex2i(xc + x, yc - y);

        glVertex2i(xc + y, yc + x);

        glVertex2i(xc + y, yc - x);

        glVertex2i(xc - x, yc - y);

        glVertex2i(xc - y, yc - x);

        glVertex2i(xc - x, yc + y);
        glVertex2i(xc - y, yc + x);
        d[1]=d[0]+2*x+1;
        x=x+1;
    }
    else
    {

        glVertex2i(xc + x, yc + y);

        glVertex2i(xc + x, yc - y);

        glVertex2i(xc + y, yc + x);

        glVertex2i(xc + y, yc - x);

        glVertex2i(xc - x, yc - y);

        glVertex2i(xc - y, yc - x);

        glVertex2i(xc - x, yc + y);

        glVertex2i(xc - y, yc + x);
        d[1]=d[0]+2*x+3-2*y;
        x=x+1;
        y=y-1;
    }
    int i=1;
    for(; i<y; i++)
    {
        if(d[i]<=0)
        {
            glVertex2i(xc + x, yc + y);

            glVertex2i(xc + x, yc - y);

            glVertex2i(xc + y, yc + x);

            glVertex2i(xc + y, yc - x);

            glVertex2i(xc - x, yc - y);

            glVertex2i(xc - y, yc - x);

            glVertex2i(xc - x, yc + y);

            glVertex2i(xc - y, yc + x);
            d[i+1]=d[i]+2*x+1;
            x=x+1;
        }
        else
        {
            glVertex2i(xc + x, yc + y);

            glVertex2i(xc + x, yc - y);

            glVertex2i(xc + y, yc + x);

            glVertex2i(xc + y, yc - x);

            glVertex2i(xc - x, yc - y);

            glVertex2i(xc - y, yc - x);

            glVertex2i(xc - x, yc + y);

            glVertex2i(xc - y, yc + x);
            d[i+1]=d[i]+2*x+3-2*y;
            x=x+1;
            y=y-1;
        }
    }

    glEnd();

    glFlush();

}

void init()

{

    glClearColor(0.7, 0.7, 0.7, 0.7);

    glMatrixMode(GL_PROJECTION);

    glLoadIdentity();

    gluOrtho2D(-50, 50, -50, 50);

}

int main(int argc, char* argv[])
{

    printf("Enter the coordinates of the circle's centre:");
    scanf("%d  %d",&xc,&yc);

    printf("Enter the value of r : ");

    scanf("%d",&r);

    glutInit(&argc, argv);

    glutInitDisplayMode(GLUT_RGB | GLUT_SINGLE);

    glutInitWindowSize(350, 350);

    glutInitWindowPosition(100, 100);

    glutCreateWindow("Midpoint Circle");

    init();

    glutDisplayFunc(display);

    glutMainLoop();

}
```



```
Enter the coordinates of the circle's centre:0 0
Enter the value of r : 20
```

```
0 error(s), 0 warning(s) (0 minute(s), 1 second(s))


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```