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GROUP A:PROGRAM:3

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PROBLEM STATEMENT: Write c++ program to draw the following pattern.Use DDA line and Bresenham's circle drawing algorithm.

CODE:

```
#include<iostream>
#include<graphics.h>
#include<stdlib.h>
using namespace std;
class dcircle                    //class named dcircle is created
{
private:int x0,y0;               //access specifiers
public:
dcircle                         //constructor
{
x0=0;
y0=0;
}
void setoff(int xx,int yy)          //member function of class dcircle
{
x0=xx;
y0=yy;
}
```

```
void drawc(int x1,int y1,int r)        //member function of class dcircle
{
float d;
int x,y;
x=0;
y=r;
d=3-2*r;
do
{
putpixel(x1+x0+x,y0+y-y1,15);
putpixel(x1+x0+y,y0+x-y1,15);
putpixel(x1+x0+y,y0-x-y1,15);
putpixel(x1+x0+x,y0-y-y1,15);
putpixel(x1+x0-x,y0-y-y1,15);
putpixel(x1+x0-y,y0-x-y1,15);
putpixel(x1+x0-y,y0+x-y1,15);
putpixel(x1+x0-x,y0+y-y1,15);
if(d<=0)
{
d=d+4*x+6;
}
else
{
d=d+4*(x-y)+10;
y=y-1;
}
x=x+1;
}
while(x<y);
}
};
class pt                        //class names pt is created
{
protected:int xco,yco,color;       //access specifiers used for encapsulation
public:
pt()                                //constructor
{
xco=0,yco=0,color=15;
}
```

```
void setco(int x,int y)
{
xco=x;
yco=y;
}
void setcolor(int c)
{
color=c;
}
void draw()
{
putpixel(xco,yco,color);
}
};
class dline:public pt              //dline is derived from class pt
{
private:int x2,y2;                 //access specifiers
public:
dline()                            //default constructor
{
x2=0;
y2=0;
}
void setline(int x,int y,int xx,int yy)        //member function of class dline
{
pt::setco (x,y);
x2=xx;
y2=yy;
}
void drawl(int colour)                  //member function
{
float x,y,dx,dy,length;                 //variable declarations
int i;
pt::setcolor(colour);
dx=abs(x2-xco);
dy=abs(y2-yco);
if(dx>=dy)
{
length=dx;
```

```
}
else
{
length=dy;
}
dx=(x2-xco)/length;
dy=(y2-yco)/length;
x=xco+0.5;
y=yco+0.5;
i=1;
while(i<=length)
{
pt::setco(x,y);
pt::draw();
x=x+dx;
y=y+dy;
i=i+1;
}
pt::setco(x,y);
pt::draw();
}
};
int main()
{
int gd=DETECT,gm;
initgraph(& gd,& gm,NULL);
int x,y,r,x1,x2,y1,y2,xmax,ymax,xmid,ymid,n,i;
dcircle c;                                              //object is created
cout<<"\n enter coordinates of centre of circle:";
cout<<"\n enter the value of x:";
cin>>x;
cout<<"\n enter the value of y:";
cin>>y;
cout<<"\n enter the value of radius:";
cin>>r;
xmax=getmaxx();                          //get maximum
ymax=getmaxy();                          //get maximum
xmid=xmax/2;
ymid=ymax/2;
```

```
setcolor(1);
c.setoff(xmid,ymid);
line(xmid,0,xmid,ymax);
line(0,ymid,xmax,ymid);
setcolor(15);
c.drawc(x,y,r);
pt p1;                                  //object of pt class
p1.setco(100,100);                      //function call,assigning x & y coordinates
p1.setcolor(14);                        //assigning color
dline l;                                //object of dline class
l.setline(x1+xmid,ymid-y1,x2+xmid,ymid-y2);      //function call
cout<<"enter total no of lines:";
cin>>n;
for(i=0;i<n;i++)
{
cout<<"enter co-ordinates of point x1:";
cin>>x1;
cout<<"enter co-ordinates of point y1:";
cin>>y1;
cout<<"enter co-ordinates of point x2:";
cin>>x2;
cout<<"enter co-ordinates of point y2:";
cin>>y2;
l.setline(x1+xmid,ymid-y1,x2+xmid,ymid-y2);      //function calls
l.drawl(15);
}
cout<<"\n enter co-ordinates of centre of circle:";
cout<<"\n enter the value of x:";
cin>>x;
cout<<"\n enter the value of y:";
cin>>y;
cout<<"\n enter the value of radius:";
cin>>r;
setcolor(5);
c.drawc(x,y,r);
getch();
delay(20000);
closegraph();
return 0;
```

}

INPUT:

enter coordinates of centre of circle:
enter the value of x:[xcb] Unknown sequence number while processing queue
[xcb] Most likely this is a multi-threaded client and XInitThreads has not been called
[xcb] Aborting, sorry about that.
abc: ../../src/xcb_io.c:260: poll_for_event: Assertion `!xcb_xlib_threads_sequence_lost' failed.
100

enter the value of y:70

enter the value of radius:30
enter total no of lines:3
enter co-ordinates of point x1:40
enter co-ordinates of point y1:40
enter co-ordinates of point x2:100
enter co-ordinates of point y2:124
enter co-ordinates of point x1:40
enter co-ordinates of point y1:40
enter co-ordinates of point x2:160
enter co-ordinates of point y2:40
enter co-ordinates of point x1:160
enter co-ordinates of point y1:40
enter co-ordinates of point x2:100
enter co-ordinates of point y2:124

enter co-ordinates of centre of circle:
enter the value of x:100

enter the value of y:62

enter the value of radius:60

OUTPUT: