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University roll no - 1121150 Subject name - Computer Graphics Lab

Paper code - PBC 602

Q2

Source code

```
#include <stdio.h>
#include <graphics.h>
void drawcircle (int x0, int y0, int radius)
{
    int x = radius
    int y = 0;
    int err = 0;
    while (x >= y)
    {
        putpixel (x0+x, y0+y, 7);
        putpixel (x0+y, y0+x, 7);
        putpixel (x0-y, y0+x, 7);
        putpixel (x0-x, y0+y, 7);
        putpixel (x0-x, y0-y, 7);
```

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```
putpixel (x0-y, y0-x, 7);
putpixel (x0+y, y0-x, 7);
putpixel (x0+x, y0-y, 7);
if (err <= 0)
{
    y += 1;
    err += 2*y+1
}
if (err > 0)
{
    x -= 1;
    err -= 2*x + 1;
    }
}
}
int main ()
{
int gdriver = DETECT, gmode, error, x, y, r;
Printf ("Enter radius of circle: "); Scanf ("%d", &r);
```

Scan

```
printf ("Enter co-ordinates of center (x and y):")
scanf ("%d %d", &x, &y);
initgraph (&gdriver, &gmode, "");
   drawcircle (x, y, r);
   delay (9999999);
   return 0;
}
```

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Algorithm

Procedure

Centre of circle = (x_0, y_0)

Radius of circle = R

Step 1 - Assign the starting point co-ordinates (x_0, y_0)

$x_0 = 0$

$y_0 = R$

Step 2 : Calculate the value of initial decision P_0 as-

$$P_0 = 1 - R$$

Step 3 : Suppose the current point is (x_k, y_k) and the next point as (x_{k+1}, y_{k+1})

Find the next point the first octant depending on the value of decision parameter P_k follow the below two cases

Two cases —

Case - 01
$P_k < 0$

$x_{k+1} = x_{k+1}$

$y_{k+1} = y_k$

$p_{k+1} = p_k + 2 \times x_{k+1} + 1$

Case - 02
$P_k >= 0$

$x_{k+1} = x_{k+1}$

$y_{k+1} = y_k - 1$

$p_{k+1} = p_k - 2 \times y_{k+1} + 2 \times x_{k+1} + 1$

Step 4 -

If the given centre point (x_0, y_0) is not $(0, 0)$ then do the following and plot the point -

$$x_{plot} = x_0 + y_0$$

$$y_{plot} = y_0 + y_0$$

Step 5 - Keep repeating step - 3 and step-4 until

$x_{plot} >= y_{plot}$

Step 6 - Step 5 generates all the point for one Octant

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