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Course : BCA 6 'C'   Paper code : PBC - 602

P2

```c
# include <stdio.h>
#include <graphics.h>
void drawcircle (int x0, int y0, int radius)
{
    int x = radius;
    int y = 0;
    int err = 0;
    while (n>=y)
    {
        putpixel (n0+n, y0+y, 7);
        putpixel (n0+y, y0+n, 7);
        putpixel (n0-y, y0+n, 7);
        putpixel (n0-0, y0+y, 7);
        putpixel (n0-n, y0-y, 7);
        putpixel (n0-y, y0-n, 7);
        putpixel (n0+y, y0-n, 7);
        putpixel (n0+n, y0-y, 7);

        if (err<=0)
        {

            y=y+1;
            err= err+ 2*y+1;
        }
        if (err>0)
        {

            n=n-1;
            err= err- 2*n+1;
```

```c
        }
      }
    }

int main ()
{
int gdriver = DETECT, gmode, error, n, y, r;
printf ("Enter radius of circle:");
scanf ("%d", &r);
printf ("Enter co-ordinates of center (n and y):");
scanf ("%d %d", &n, &y);
initgraph (&gdriver, &gmode, " ");
drawcircle (n, y, r)
delay (9999999);
return 0;
}
```

Algorithm:

Procedure

centre of circle = (x_0, y_0)
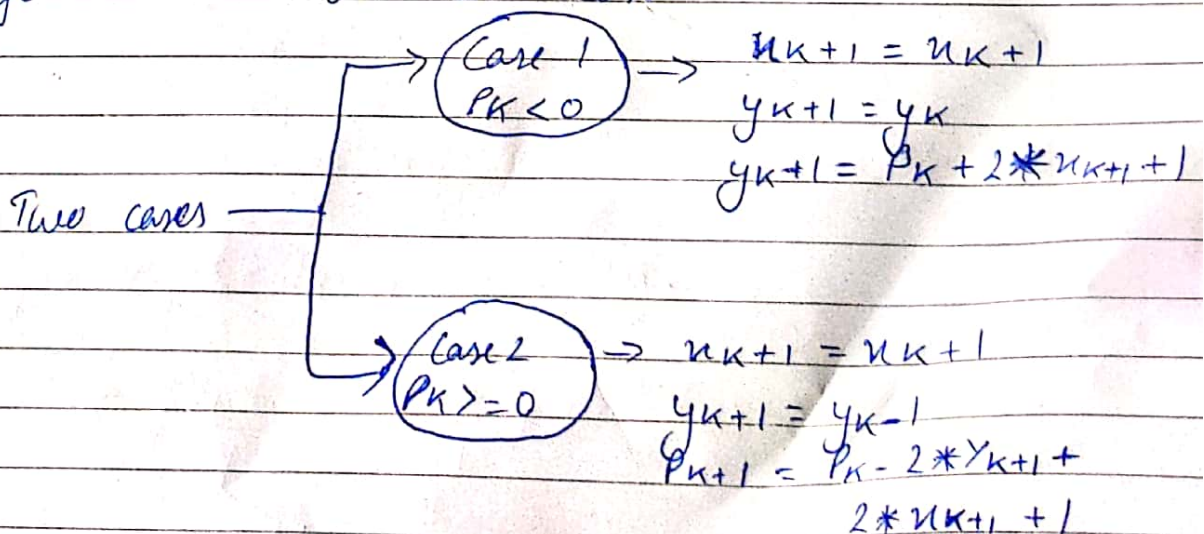Radius of circle = R

Step-1: Assign the starting point coordinates (x_0, y_0) as -

$$x_0 = 0$$
$$y_0 = R$$

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

$$P_0 = 1 - R$$

Step-3: Suppose the current point is (x_k, y_k) and the next points is (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 1
$P_K < 0$ → $x_{k+1} = x_k + 1$
$y_{k+1} = y_k$
$y_{k+1} = P_k + 2 * x_{k+1} + 1$

→ Case 2
$P_K >= 0$ → $x_{k+1} = x_k + 1$
$y_{k+1} = y_k - 1$
$P_{k+1} = P_k - 2 * y_{k+1} + 2 * x_{k+1} + 1$

Step-4: If the given centre point (x_0, y_0) is not $(0, 0)$ then do the following and plot the point—

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

Step-5: Keep repeating step-03 and step-04 until $X_{plot} \geq Y_{plot}$

Step-6: Step 5 generates all the points for one octant.

Quadrant 2 $(-x, y)$
Quadrant 1 (x, y)
octant 8 (x, y)
octant 1 (x, y)
octant 7 (y, x)
octant 2 (y, x)
octant 6 $(-y, -x)$
octant 3 $(y, -x)$
octant 5 $(-x, -y)$
octant 4 $(x, -y)$
Quadrant 3 $(-x, -y)$
Quadrant 4 $(x, -y)$