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~~Course~~ - Computer Graphics & Animation
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Q Ans) 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);
        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);
    Printf ("Enter co-ordinates of center
            (x and y): ");
     Scanf ("%d %d", &x, &y);
    initgraph (&gdriver, &gmode, "");
    drawcircle (x, y, r);
      delay (999999);
      return 0;
}
```

— Algorithm —

Procedure

Given –

- Centre point of circle = (X_0, y_0)
- Radius of circle = R

Step 1 – Assign the starting point coordinates (X_0, y_0) as

- $X_0 = 0$
- $y_0 = R$

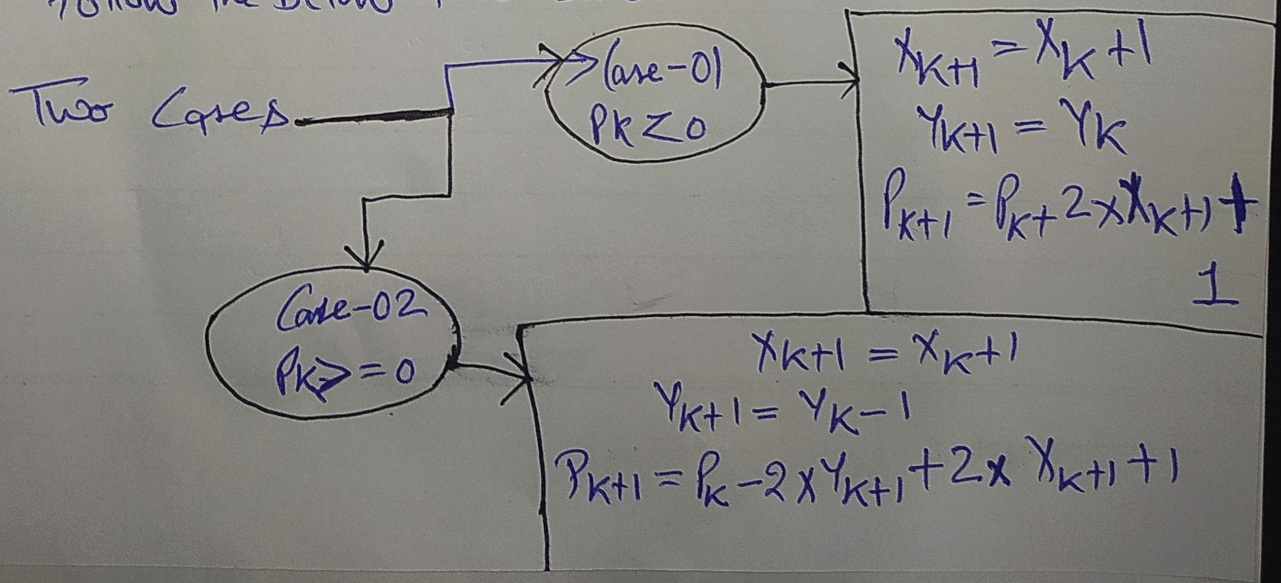
Step 2 – Calculate the value of initial decision parameter P_0 as –

$$P_0 = 1 - R$$

Step 3 – Suppose point is (X_K, Y_K) and the next point (X_{K+1}, Y_{K+1}).

Find next point of the first octant depending on the value of decision parameter P_K,

Follow the below two cases :–



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

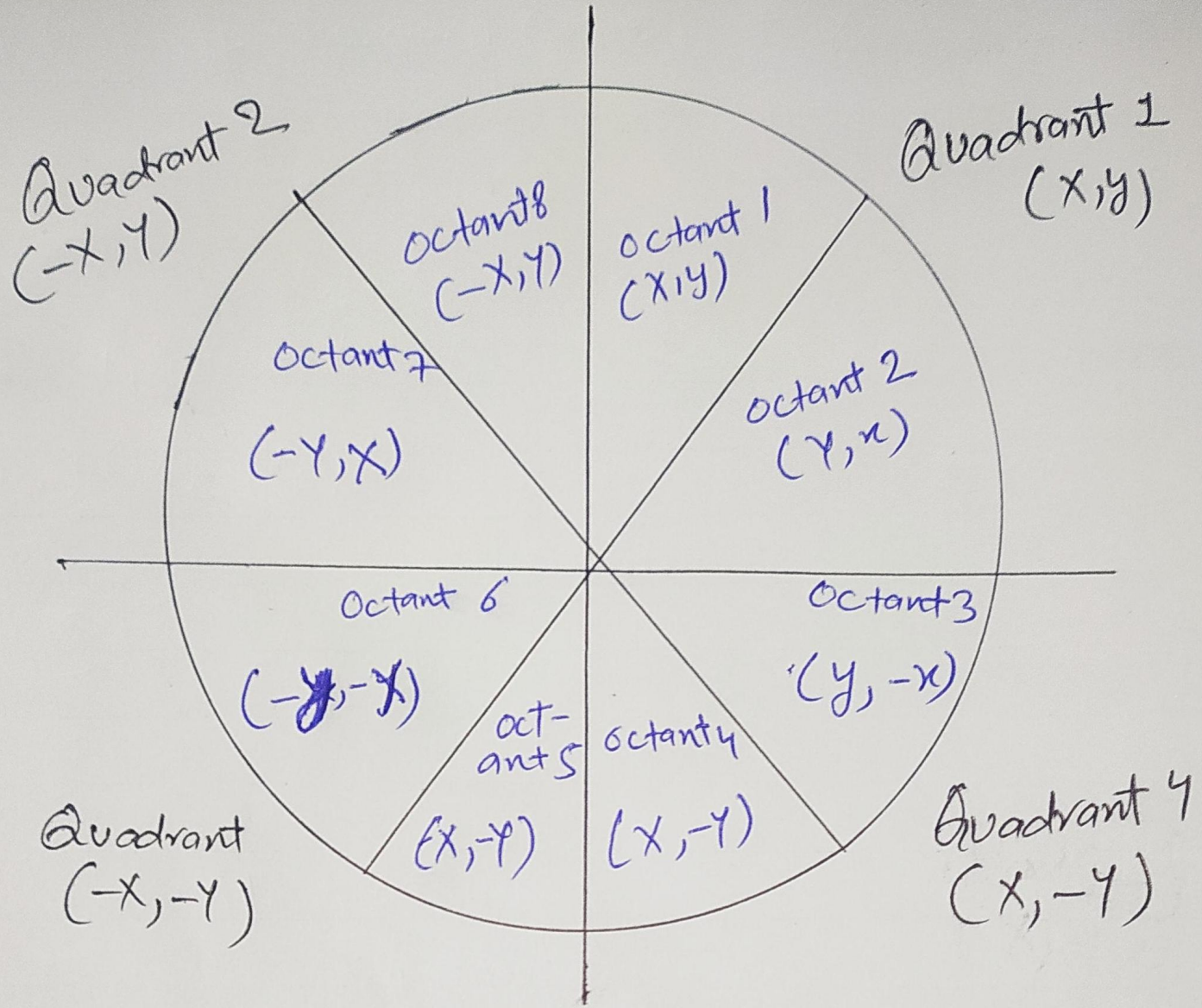
- $X_{plot} = X_c + X_0$
- $Y_{plot} = Y_c + Y_0$

Here, (X_c, Y_c) denotes the current value of x and y coordinates.

Step 5 :- Keep repeating Step -03 and Step -04 Until $X_{plot} >= Y_{plot}$

Step 6 :- Step-05 generates all the point for on octant.

To find the point for other seven octants, follow the eight symmetric property of circle,


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)
oct-
ant 5
(x, -y)
octant 4
(x, -y)
Quadrant
(-x, -y)
Quadrant 4
(x, -y)

Enter radius of circle: 50
Enter co-ordinates of center(x and y): 250 250
[xcb] U
[xcb] M
called
[xcb] A
circ:
nce_los
]

SDL-libgraph -- Graphics on GNU/Linux