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course - BCA B

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Subject - Computer graphics

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Q3 write an algorithm and program to implement Bresenham circle line drawing algorithm

Source code

```
#include <stdio.h>
```

```
#include <graphics.h>
```

```
void main()
```

```
{
```

```
int gd = DETECT, gm;
```

```
int x, y, r, xc = 320, yc = 240;
```

```
printf("enter the radius");
```

```
scanf("%d", &r);
```

```
initgraph(&gd, &gm, " ");
```

```
x = 0;
```

```
y = r;
```

putpixel (xc+y, yc-y, 1)

p = 3 - (2 \* x);

for (x=0; ~~for~~ x <= y; x++)

{

if (p < 0)

{

y = y - 1;

p = (p + (4 \* x) + 6);

}

else

{

y = y - 1;

p = p + (4 \* (x - y) + 10);

}

putpixel (xc+x, yc-y, 1);

putpixel (xc-x, yc-y, 2);

putpixel (xc+x, yc+y, 3);

putpixel (xc-x, yc+y, 4);

putpixel (xc+y, yc-x, 5);

putpixel (xc-y, yc+x, 6);

putpixel (xc+y, yc+x, 7);

putpixel (xc-y, yc+x, 8);

getch();

Josephgraph();

# Algorithm

Step 1- Assign starting point as

$$x_0 = 0$$

$$y_0 = R$$

Step 2 - calculate the value of initial decision ~~per~~ perimeter  $P_0$

$$P_0 = 3 - 2R$$

Step 3 - ① case  $P_k < 0$

~~$$\begin{aligned} x_{k+1} &= x_{k+1} \\ y_{k+1} &= y_k \\ P_{k+1} &= P_k + 4 \end{aligned}$$~~

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

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

$$P_{k+1} = P_k + 4x(x_{k+1} + 6)$$

② case  $P_k > 0$

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

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

$$P_{k+1} = P_k + 4x(x_{k+1} - y_{k+1}) + 10$$



step 4 - If  $(x_0, y_0)$  is not  $(0, 0)$  then

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

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

step 5 =  $x_{plot} \neq y_{plot}$

