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SUB ⇒ Computer Graphics

Course ⇒ BCA VI

Aul 3 Raman

Breesenham's circle drawing Algo.

```
#include<graphics.h>
#include<stdlib.h>
#include<stdio.h>
#include<conio.h>
#include<math.h>
void Eightwaysymmetricplot(int xc, int yc, int x, int y)
{
putpixel(x+xc, y+yc, RED);
putpixel(x+xc, -y+yc, YELLOW);
putpixel(-x, xc, -y+yc, GREEN);
putpixel(-x+xc, y+yx, YELLOW);
putpixel(y+xc, x+yc, 12);
putpixel(y+xc, -x+yc, 14);
putpixel(-y+xc, -x+yc, 15);
putpixel(-y+xc, x+yc, 6);
}
Void Breesenham Circle(int xc, int yc, int r)
{int x=0, y=r, d=3-(2*r);
Eightway symmetricplot(xc, yc, x, y);
```

```
while (x<=y)
{
 if (d<=0)
    {
d = d + (4*x) +6 ;
}
 else
{ d= d + (4*x) -(4*y) +10 ;
   y= y-1;
}
  x= x+1 ;
 Eightwaysymmetric Plot (xc,yc,x,y);
}
 int main (void)
{  int xc,yc,r, gdriver = DETECT, gmode, errorcode;
 initgraph (&gdriver,&gmode," C:\TURBOC3\BGI");
 errorcode = graphresult ();
 if (errorcode != grOK)
 { printf ("Graphic error : %s\n", grapherrormsg
                                    (errorcode));
 printf ("Press any key to halt:")
 getch ();
```

```
exit(1);
}
printf("\n Enter the values of xc and yc:");
scanf("%d %d", &xc, &yc);
printf("\n Enter the value of radius:");
scanf("%d", &r);
Bresenham circle(xc, yc, r);
getch();
closegraph();
return 0;
}
```

Answer

Bresenham's Circle Algorithm

STEP 1 = Start Algorith

STEP 2 = Declare p, q, x, y, r, d variables
p, q are coordinates of the centers of the circle r is the radius of the circle

STEP 3: Enter the value of r

STEP 4: Calculate $d = 3 - 2r$

STEP 5: initialize $x = 0$ & $nbey = r$

STEP 6 = check if the whole circle is scan converted if $x >= y$
Stop

STEP 7 = Plot eight points by using concepts of eight way symmetry, The center is at (p, q). current active pixels is (x, y)

putpixel (x+p, y+q)
put pixel (y+p, x+q)
putpixel (-y+p, x+q)
putpixel (-x+p, y+q)
putpixel (-x+p, -y+q)

putpixel $(-y+p, -x+q)$

putpixel $(y+p, -x+q)$

putpixel $(x+p, -y-q)$

Step 8: Find location of next pixels to be scanned

if $d < 0$

then $d = d + 4x + 6$

increment $x = x + 1$

if $d \geq 0$

then $d = d + 4(x-y) + 10$

increment $x = x + 1$

decrement $y = y - 1$

Step 9: Go to Step 6

Step 10: Stop Algorith.

Pawan

*** Mid-Point Subdivision algorithm of circle ***
Enter the value of Xc  400
Enter the value of Yc  140
Enter the Radius of circle  97