

Ex 1.1

Program -

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

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

```
void midpoint (int midx, int midy, int x)
```

```
{  
    int x=0, y=r, gd=0, gm, di, dnext;
```

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

```
    di = 3 - 2 * x;
```

```
    while (x <= y)
```

```
    {  
        if (di >= 0)
```

```
        {  
            dnext = di + 4 * (x - y) + 10;
```

```
            x++;
```

```
            y--;
```

```
        }  
        else
```

```
        {  
            dnext = di + 4 * x + 6;
```

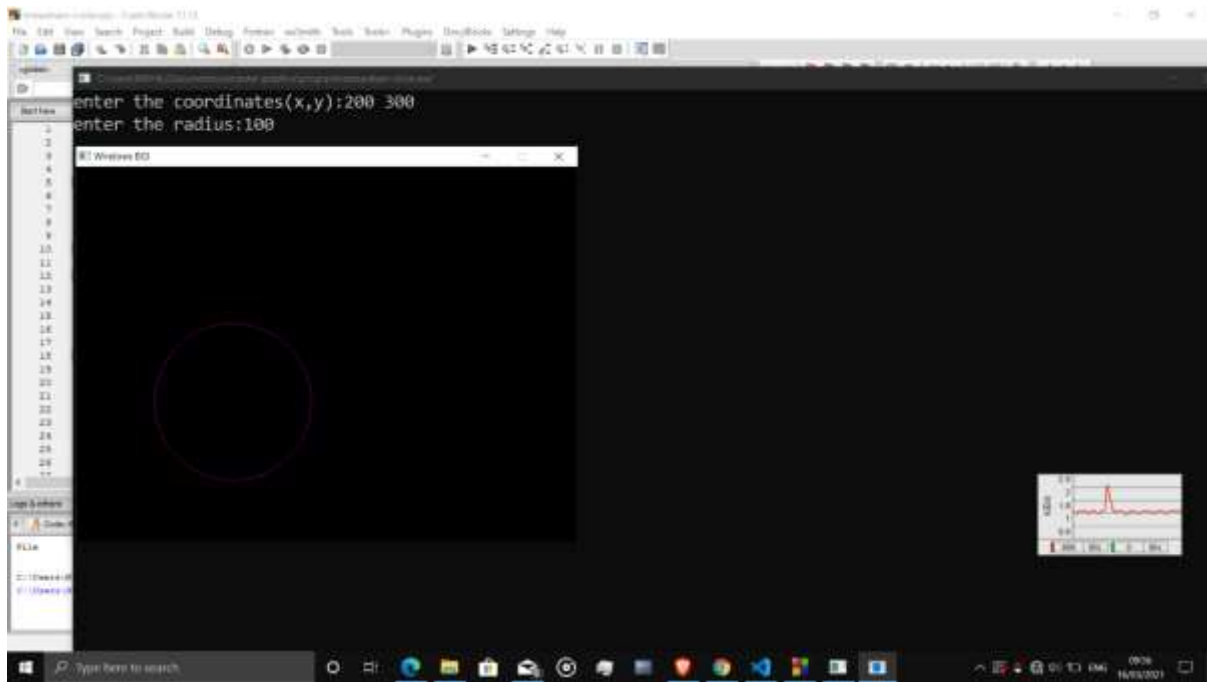
```
            x++;
```

```
        }  
        putpixel (x + midx, y + midy, 5);
```

```
        putpixel (y + midx, x + midy, 5);
```

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```
putpixel (-x+mid x, -y+mid y, 5);  
putpixel (-y+mid x, -x+mid y, 5);  
putpixel (-y+mid x, x+mid y, 5);  
putpixel (y+mid x, -x+mid y, 5);  
putpixel (x+mid x, -y+mid y, 5);  
putpixel (-x+mid x, y+mid y, 5);  
di = dnext;  
}  
getch();  
closegraph();  
}  
int main()  
{  
int gd=0, gm;  
(int mid x = 0, mid y = 0, r = 0;  
printf ("Enter the coordinates(x,y):");  
scanf ("%d%d", &mid x, &mid y);  
printf ("Enter the radius:");  
scanf ("%d", &r);  
midpoint (mid x, mid y, r);  
return 0;  
}
```



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Question 3 > Algorithm of Bresenham's Circle  
draw algorithm.

Step 1: Start

Step 2: First, allot the starting coordinates  $(x_1, y_1)$  -

$$x_1 = 0$$

$$y_1 = r.$$

Step 3: Now, calculate the initial decision parameter  $d_0$  -

$$d_0 = 3 - 2 \times r.$$

Step 4: Assume, the initial coordinates are  $(x_k, y_k)$

Next coordinates will be  $(x_{k+1}, y_{k+1})$

Now, we will find the next point of the first octant according to the

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value of decision parameter ( $d_k$ ).

Step 5: Case 1: If  $d_k < 0$

$$\text{then } x_{k+1} = x_k + 1$$

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

$$d_{k+1} = d_k + 4x_{k+1} + 6$$

Case 2: If  $d_k > 0$

$$\text{then } x_{k+1} = x_k + 1$$

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

$$d_{k+1} = d_k + 4(x_{k+1} - y_{k+1}) + 10$$

Step 6: If center coordinates  $(x_1, y_1)$  is not at origin  $(0,0)$  then we will draw the points -  $x \text{ coordinate} = x_c + x_1$

$$y \text{ coordinate} = y_c + y_1$$

Step 7 - Repeat step 5 and step 6 until get  $x = y$

Step 8 - Stop.

