Practical 9

Task 1 : Write a program to demonstrate Bresenham's mid point ellipse algorithm.

Source Code:

```
#include<graphics.h>
#include<stdio.h>
#include<math.h>
void ellipseDrawPoints(float x_center,float y_center,float x,float y)
{
  putpixel(x_center+x,y_center+y,WHITE);
  putpixel(x_center-x,y_center+y,WHITE);
  putpixel(x_center+x,y_center-y,WHITE);
  putpixel(x_center-x,y_center-y,WHITE);
}
int main()
{
  int gd = DETECT,gm;
  float xa,ya,ra,rb;

  printf("Enter the Center of Ellipse\n");
  scanf("%f %f",&xa,&ya);
  printf("Enter the x axis length of Ellipse ' a '\n");
  scanf("%f",&ra);
  printf("Enter the y axis length of Ellipse ' b '\n");
  scanf("%f",&rb);
  initgraph(&gd,&gm,NULL);
  float x = 0,y=rb;
  float px = 0,py = 2*ra*ra*y,p=rb*rb-(ra*ra*rb)+(0.25*ra*ra);
  ellipseDrawPoints(xa,ya,x,y);
  while(px<py)
  {
   x++;
   px+=2*rb*rb;
   if(p<0)
   {
    p+=rb*rb+px;
   }
   else
   {
     y--;
```

```c
        py-=2*ra*ra;
        p+=rb*rb+px-py;
      }
      ellipseDrawPoints(xa,ya,x,y);
    }
  p=rb*rb*(x+0.5)*(x+0.5)+ra*ra*(y-1)*(y-1)-ra*ra*rb*rb;
  while(y>0)
  {
    y--;
    py-=2*ra*ra;
    if(p>0)
    {
      p+=ra*ra-py;
    }
    else
    {
      x++;
      px+=2*rb*rb;
      p+=ra*ra+px-py;
    }
    ellipseDrawPoints(xa,ya,x,y);
  }

  delay(5000);
  closegraph();
  return 0;
}
```

Output:

```
$ gcc prac_9_midpointellipse_algo.c -lgraph
adnrs96@aditya-hp-envy-15-notebook-pc:/media/adnrs96/Local Disk/Local Disk(G)/CG
$ ./a.out
Enter the Center of Ellipse
300
250
Enter the x axis length of Ellipse ' a '
110
Enter the y axis length of Ellipse ' b '
40
```