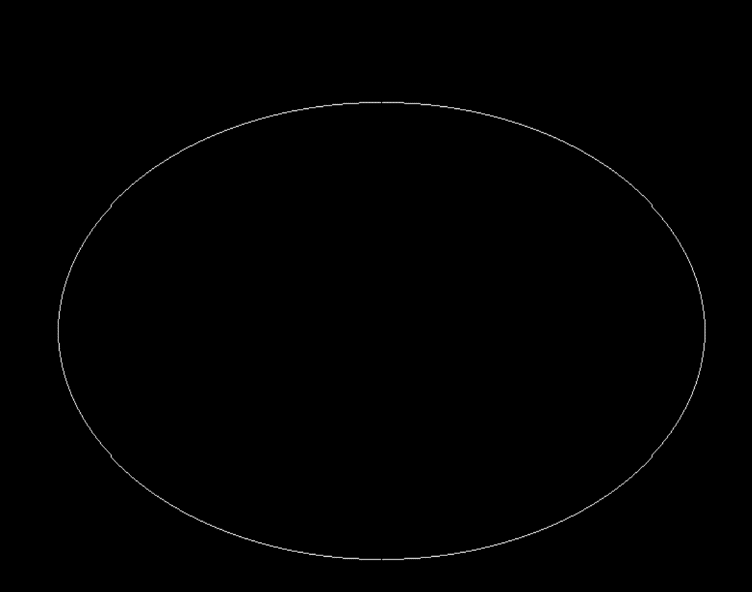
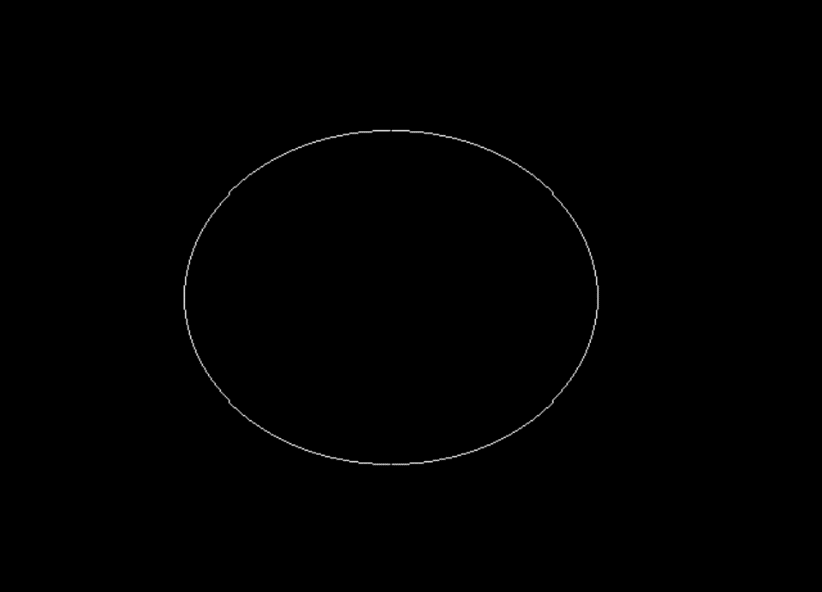
**SOURCE CODE**

1. import pygame
2. import sys
4. def midpointEllipse(rx,ry,xc,yc):
5. x = 0
6. y = ry
7. p1 = ry \* ry - rx \* rx \* ry + 0.25 \* rx \* rx
8. dx = 2 \* ry \* ry \* x
9. dy = 2 \* rx \* rx \* y
10. while(dx < dy):
11. **if**(p1<0):
12. x = x+1
13. y= y
14. p1 = p1+ dx + ry \* ry
15. dx = 2 \* ry \* ry \* x
16. dy = 2 \* rx \* rx \* y
18. **else**:
19. x = x+1
20. y =y-1
21. p1 = p1 + dx - dy + ry \* ry
22. dy = 2 \* rx \* rx \* y
23. dx = 2 \* ry \* ry \* x

26. screen.set\_at((round(xc + x), round(yc + y)), WHITE)
27. screen.set\_at((round(xc - x), round(yc + y)), WHITE)
28. screen.set\_at((round(xc + x), round(yc - y)), WHITE)
29. screen.set\_at((round(xc - x), round(yc - y)), WHITE)
31. p2 = ry \* ry\* (x+ 0.5) \* (x+0.5) + rx\*rx\*(y-1)\*(y-1)-rx\*rx\*ry\*ry
33. while(y!=0):
34. **if**(p2>0):
35. x = x
36. y = y-1
37. p2 = p2 + rx \* rx - dy
38. dy = 2 \* rx \* rx \* y
39. dx = 2 \* ry \* ry \* x
41. **else**:
42. x = x+1
43. y = y-1
44. p2 = p2 + dx - dy + rx \* rx
45. dy = 2 \* rx \* rx \* y
46. dx = 2 \* ry \* ry \* x
48. screen.set\_at((round(xc + x), round(yc + y)), WHITE)
49. screen.set\_at((round(xc - x), round(yc + y)), WHITE)
50. screen.set\_at((round(xc + x), round(yc - y)), WHITE)
51. screen.set\_at((round(xc - x), round(yc - y)), WHITE)

54. pygame.init()
55. WIDTH = 800
56. HEIGHT = 600
58. screen = pygame.display.set\_mode((WIDTH, HEIGHT))
60. pygame.display.set\_caption("Midpoint Ellipse Algorithm")
62. WHITE = (255, 255, 255)
63. BLACK = (0, 0, 0)
65. def main():
66. while True:
67. for event **in** pygame.event.**get**():
68. **if** event.type==pygame.QUIT:
69. pygame.quit()
70. sys.exit()
71. screen.fill(BLACK)
72. midpointEllipse(160, 130, 400, 300)
74. pygame.display.flip()
75. pygame.time.delay(100)
77. **if** \_\_name\_\_ == "\_\_main\_\_":
78. main()

**OUTPUT**

**

*Fig. 6.1: Output of Midpoint Ellipse Algorithm*