

MID - POINT ELLIPSE ALGORITHM

Mid-Point Ellipse (X_c, Y_c, R_x, R_y):

Description: Here X_c and Y_c denote the x - coordinate and y - coordinate of the center of the ellipse and R_x and R_y denote the x - radius and y - radius respectively.

1. Set $R_xSq = R_x * R_x$
2. Set $R_ySq = R_y * R_y$
3. Set $X = 0$ and $Y = R_y$
4. Set $P_x = 0$ and $P_y = 2 * R_xSq * Y$
5. Call Draw Ellipse(X_c, Y_c, X, Y)
6. Set $P = R_ySq - (R_xSq * R_y) + (0.25 * R_xSq)$ [Region 1]
7. Repeat While ($P_x < P_y$)
 8. Set $X = X + 1$
 9. $P_x = P_x + 2 * R_ySq$
 10. If ($P < 0$) Then
 11. Set $P = P + R_ySq + P_x$
 12. Else
 13. Set $Y = Y - 1$
 14. Set $P_y = P_y - 2 * R_xSq$
 15. Set $P = P + R_ySq + P_x - P_y$
 16. [End of If]
 16. Call Draw Ellipse(X_c, Y_c, X, Y)
 17. [End of Step 7 While]
 17. Set $P = R_ySq * (X + 0.5)^2 + R_xSq * (Y - 1)^2 - R_xSq * R_ySq$ [Region 2]
 18. Repeat While ($Y > 0$)
 19. Set $Y = Y - 1$
 20. Set $P_y = P_y - 2 * R_xSq$
 21. If ($P > 0$) Then
 22. Set $P = P + R_xSq - P_y$
 23. Else
 24. Set $X = X + 1$
 25. Set $P_x + 2 * R_ySq$
 26. Set $P = P + R_xSq - P_y + P_x$

[End of If]

27. Call Draw Ellipse(X_C , Y_C , X, Y)

[End of Step 18 While]

28. Exit

Draw Ellipse (X_C , Y_C , X, Y):

1. Call PutPixel($X_C + X$, $Y_C + Y$)

2. Call PutPixel($X_C - X$, $Y_C + Y$)

3. Call PutPixel($X_C + X$, $Y_C - Y$)

4. Call PutPixel($X_C - X$, $Y_C - Y$)

5. Exit