Angel: Interactive Computer Graphics, Seventh Edition

Chapter 3 Odd Solutions

3.7 There are a couple of potential problems. One is that the application program can map different points in object coordinates to the same point in screen coordinates. Second, a given position on the screen when transformed back into object coordinates may lie outside the user's window.

3.11 Consider a three position switch. The three positions can correspond to velocities of 0, +1 and -1. We can integrate to get positions from these velocities. Thus, we have no change (0), a constantly increasing position (+1), and a constantly decreasing position (-1).

3.13 Let (x_1, y_1) be the end of the arm of length l_1. Assuming that the lower-left corner is the origin

$$x_1 = l_1 \cos\theta$$

$$y_1 = l - 1 \sin\theta$$

If (x_2, y_2) is the position of the end of the second arm, we can use a similar formula measured from (x_1, y_1)

$$x_2 = x_1 + l_2 \sin\phi$$

$$y_2 = y_1 + l_2 \sin\phi$$