Tut 5

Qn 1

The standard approach for animated cartoons is applied to other animation applications as well, though there are many special applications that do not follow the approach. Suggest some applications that do not follow the approach and discuss how they work.

Qn 2

Films seen in the cinema are refreshed at 24 frames per second. For a 2 hour film with an average of five in-betweens for each pair of key frames, calculate the number of key frames required. Repeat your calculations for a graphics monitor refreshed at 60 Hz.

Qn 3

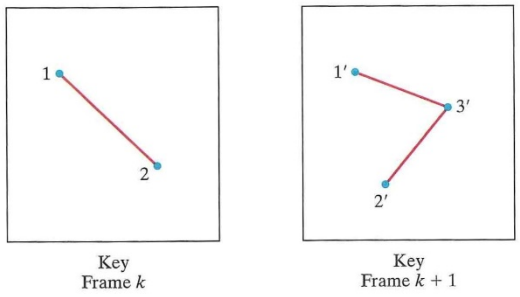


Fig. 1

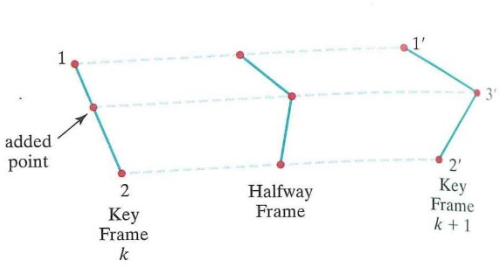


Fig. 2

In Fig. 1, suppose the vertex positions in key frame k and k + 1 are given by

$(x_1, y_1)_k = (-40, 40)$ $(x_2, y_2)_k = (40, -40)$

$(x_1, y_1)_{k+1} = (-30,35)$ $(x_2, y_2)_{k+1} = (-10,-20)$

$(x_3, y_3)_{k+1} = (50,20)$

Suppose a third vertex is introduced midway between the vertex 1 and vertex 2.

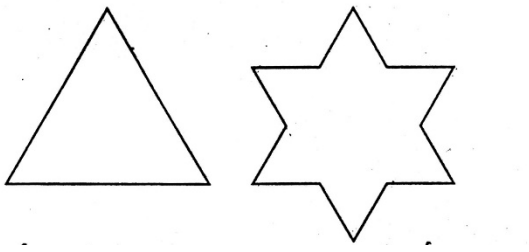
a) Calculate the three vertex positions of the halfway frame in Fig. 2.
b) Suppose there are now two in-between frames instead of one. Calculate the three vertex positions in in-between frame 1 and in-between frame 2.

Qn 4

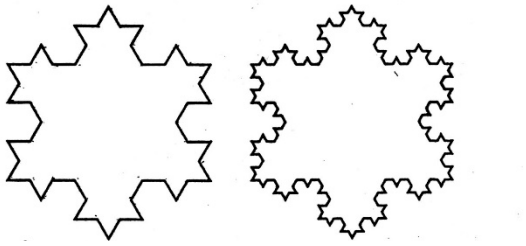
Using the data in Qn 3. Suppose 5 in-between frames are to be generated using the acceleration function 1 - cosθ. Let $t_1 = 0$ sec, $t_2 = 1$ sec. Calculate the vertex positions for in-between frame 1 to in-between frame 5.

Qn 5

Self similar objects, known as fractals, can be generated by defining a generation rule. Consider the Koch curve below:



key frame 1 key frame 2



key frame 3 key frame 4

a) Write down the generation rule.

b) Find the parameters V_{max}, V_{min}, N_{ls}, N_p for key frame pair 1, 2 and key frame pair 2, 3.

c) Mark the positions of vertices that you would introduce to key frames 1, 2 and 3. Show clearly how you would correspond to them.

OpenGL Mini-project Progress

Work out OpenGL Ex. 3. Also, animate your mini-project character. Design a lively animation. Note that the camera can also change position if you wish it to.