will illustrate this more fully using the melody in Figure 1. The piece of music contains all of the natural pitch classes as well as B♭, so the obvious choice for the state space (I) is the set of pitch classes

I = {F, G, A, B♭, B, C, D, E}.

The transition matrix in Table 1 records all the transitions between notes, with their relative frequencies. For example, there are four transitions from F, of which three are to G, while the fourth is to A. This gives the first row of the table: the transition probabilities are 3/4 from F to G, 1/4 from F to A, and 0 for other transitions. Each row of the table corresponds to transitions from a different pitch class. It can be seen that most transitions are from one pitch class to an adjacent one.

To use this matrix in a compositional scenario we start by choosing an initial note – say, A. We look along the A row of our table to choose our second note; we randomly choose between F, G, B and C, and with respective probabilities 1/8, 1/2, 1/4 and 1/8.

Suppose we choose B. Looking along the fifth row of Table 1, we select our third note, making a random, equiprobable choice between G, C, and D. And so on. We, or the computer, can use random (or pseudo-random) numbers to guide the choices at each note.

Every time we run the exercise, the resulting tune will be different . Below are three pitch sequences generated from the Markov model using pseudo-random numbers. For ease of reading, each melody is split up according to the phrase structure of the original music in Figure 1 (to hear all of these melodies, visit `http://www.tomcollinsresearch.net` and follow the links).

1. A, G, F, G, F, G, A, B, G,
   F, G, F, G, A, B, D, E,
   B, C, A, F, G,
   B♭, A, F, G, A, G, A, B, G, A.

2. A, G, A, B, D, C, B♭, A, F,
   G, F, A, B, D, C, A, G,
   A, G, F, A, F,
   A, F, G, F, G, A, G, F, A, G.

3. F, A, B, G, F, G, F, G, A,
   B, C, A, G, F, G, F, G,
   B♭, A, G, A, G,
   A, F, G, B♭, A, B, G, F, G, A.

Figure 1. Bars 3–10 of the melody from “Lydia”, Op. 4 No. 2, by Gabriel Fauré (1845–1924).