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**Counting melodies: recursion through music for a liberal arts audience.**

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Summary: In the study of music from a mathematical perspective, several types of counting problems naturally arise. For example, how many different rhythms of a specified length (in beats) can be written if we restrict ourselves to only quarter notes (one beat) and half notes (two beats)? What if we allow whole notes, dotted half notes, etc.? Or, what if we allow each note to be selected from some specified set of tones (e.g., C, C $\sharp$ , D, etc.)? In my course on music and mathematics for the liberal arts, I use these questions as a method of introducing students to the concept of recursion, as it turns out that such questions lead naturally to sequences (indexed based on the length of the rhythms or melodies being considered) defined by recurrence relations, such as the Fibonacci sequence.

*Classification:* M85 K25 N75

*Keywords:* counting; Fibonacci sequence; liberal arts mathematics; mathematics and arts; music and mathematics; recursion

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