Homework 3
Math 109 / Music 109A, Spring 2005

Due Monday, February 28.

(1) Identify these chords by root note and suffix (e.g., Gm7 or Bb aug). In the case of augmented or diminished seventh chords, take the root to be the lowest note.

(a) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(b) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(c) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(d) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

Identify these chords by root scale note and suffix (e.g., III7 or ⅡV m) relative to the indicated mode. Again, in the case of augmented or diminished seventh chords, take the root to be the lowest note.

(e) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(f) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(g) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

(h) \begin{tikzpicture}
\begin{scope}[very thick, scale=0.5]
\draw[fill=white] (0,0) circle (0.5); \draw[fill=white] (0,-1) circle (0.5); \draw[fill=white] (1,0) circle (0.5); \draw[fill=white] (1,-1) circle (0.5);
\end{scope}
\end{tikzpicture}

major

minor

major

Lydian

(2) Write these chords with correct spelling on the bass clef.

(a) Em7
(b) D♭dim
(c) A♭
(d) C♭7

(3) Write these chords with correct spelling on the bass clef, using the indicated key signature and mode.

(a) bII7 in the key of C major

(b) IVm7 in the key of B♭ minor

(c) Iaug in the key of F Myxolydian

(d) bVII in the key of E♭ major

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(4) For each of the seven types of chords discussed in the text, list by Roman numeral all the ways the chord can be created using only diatonic notes in the major mode.

(5) Consider the four-note chord obtained by taking the seventh chord and flatting its fifth. Such a chord is sometimes labeled with the suffix $^7_5$. Write the sequence of semitones $(a, b, c, d)$ which define the chord and use this sequence to explain why this chord does not have a unique root. How many possible roots does it have? Write an example of such a chord on some clef and give all possible labelings of it by root note class.

(6) Name the chord given by each of these sequence of semitones:
   (a) 5,3  (b) 3,2,4  (c) 6,3,6  (d) 7,8,7  (e) 16,6,9,5,7

(7) Name the chord given by each of these sequence of intervals:
   (a) fifth, fourth, major third, tritone
   (b) minor sixth, major third, major third
   (c) fifth, octave, minor sixth, major third
   (d) step, fifth, major sixth
   (e) minor third, step, minor third

(8) Give a plausible harmonization of this melody by providing, in the bass clef, one whole note chord for each measure. Label each chord by root scale tone (Roman numeral) and chord type (e.g., II$m^7$).

(9) Analyze the basic harmony in the first 16 measures of *Maple Leaf Rag*. Each measure will have at most two chords. Label the chords by root note class and chord type (e.g., $G^7$). (Note: In a few places the chords are incomplete.) The music can be downloaded as a pdf file from the website.

(10) Do the same for the first five bars of *Moonlight Sonata*. It is also downloadable from the website.