Variations – Supplemental Practice Exercises (Part I)

Here are a few examples for you to try. We’ll go over these in class, as needed. Solutions are given on pages 2-4 of this handout.

For each, I’ll just give you a “melody” as an ordered list of notes. Your job is to apply the given variation to each one, to find the new variation. You can write just write them as a list of notes, or (if you prefer) on a music staff. You can find some sheet music on the “notes” section of the class web page (click the “free sheet music” link).

Reminder: The notation “$I$,” without a subscript, always refers to inversion centered at C – this is the inversion that is defined in the text.

1. G, F#, A, G, G, C – find: $T\_{4}$, $T\_{4}R$, and $T\_{4}I$
2. D, C, B, A, A, G, B – find $T\_{6}$, $T\_{6}I$, and $IT\_{6}$
3. D, D, C#, A, B, C#, D – find $IR$and $T\_{2}IR$
4. E, G, D, G, C, D, E, F, D, G – find $I, R, $ and $T\_{8}$

1. G, F#, A, G, G, C – find: $T\_{4}$, $T\_{4}I$, and $IT\_{4}$

Recall that you find $T\_{4}$ by raising each note by four semitones.

$T\_{4}: $ **B, A#, C#, B, B, E**

$T\_{4}I:$ To find this variation, apply the inversion to $T\_{4}$, which you already found. Recall that you find the inversion by “reflecting” each note across a “C” – or, equivalently, by “reflecting” each note horizontally across the “musical clock” diagram.

$T\_{4}: $ B, A#, C#, B, B, E

$T\_{4}I$**: C#, D, B, C#, C#, G#**

$IT\_{4}:$ This is the inversion followed by $T\_{4}$. It’s tempting to just assume that the answer here will be same as the answer for $T\_{4}I$, but that assumption would be incorrect! To see for yourself, first find the inversion of the original melody:

Melody: G, F#, A, G, G, C

Inversion: F, F#, D#, F, F, C

…then, apply $T\_{4}$ to the result…

$I:$ F, F#, D#, F, F, C

$IT\_{4}:$ **A, A#, G, A, A, E**

Comments:

* Note that the results of $T\_{4}I$ and $IT\_{4}$ are NOT the same! This shows that inversions and transpositions are not “interchangeable” (or “commutative,” to use the mathematical term) – the order in which they’re applied does matter!
* However, note that there is some similarity between the two answers…
$IT\_{4}$: A, A#, G, A, A, E
$T\_{4}I$: C#, D, B, C#, C#, G#

Note the “jumps” between consecutive notes: first up one semitone (from A to A#, or from C# to D), then down two semitones (from A# to G, or from D to B), and so on. This similarity is consistent with how transpositions behave; in fact, these two answers are transpositions of each other. Specifically, if you were to transpose the first variation ($IT\_{4}$) up by four semitones, you would end up with the second variation ($T\_{4}I$). .

2. D, C, B, A, A, G, B – find transposition$ T\_{6}$,$ T\_{6}I$, and$ IT\_{6}$

$T\_{6}$: G#, F#, F, D#, D#, C#, F

$T\_{6}I$: E, F#, G, A, A, B, G

To find $IT\_{6}$, we must start with the inversion of the original melody, and then transpose that result up by 6 semitones:

$I$: A#, C, C#, D#, D#, F, C#

$IT\_{6}$: E, F#, G, A, A, B, G

Comment: We noted earlier (see the comments after #1 on the previous page) that $IT\_{n}$ isn’t usually the same as $T\_{n}I$. However, an exception to this rule is when $n=6$ - that is, $T\_{6}I$ and $IT\_{6}$ DO give us the same variation; this always works! (Why is $T\_{6}$ the exception to the rule?)

Note: Exercise #2 originally asked about $T\_{7}, T\_{7}I, IT\_{7}$ rather than the variations shown here. (This was a typo caught by a student – thanks Justin!) Here are the answers for those variations…

$T\_{7}$: A, G, F#, E, E, D, F#

$T\_{7}I$: D#, F, F#, G#, G#, A#, F#

$IT\_{7}$: F, G, G#, A#, A#, C, G#

3. D, D, C#, A, B, C#, D

$T\_{-5}$ : A, A, G#, E, F#, G#, A

Comment: as noted in class, this transposition is the same as $T\_{7}$ (since -5 + 12 = 7; that is, -5 and 12 are “equivalent” under the mod 12 arithmetic rules. So, we’ll usually call this variation $T\_{7}$ rather than $T\_{-5}$ (or $T\_{19}, T\_{31}, T\_{-17}$, or any other equivalent transposition) from now on.

$I:$ A#, A#, B, D#, C#, B, A#

$IR:$ A#, B, C#, D#, B, A#, A#

Comment: $R$ denotes the “retrograde,” which simply reverses the order of the notes in a melody.

4. E, G, D, G, C, D, E, F, D, G – find $II, RR, $ and $T\_{8}$

Answers: $II $ and $RR$ both leave us with the original melody; that is, I is its own opposite, and R is its own opposite:

$I$: G#, F, A#, F, C, A#, G#, G, A#, F

$II: $E, G, D, G, C, D, E, F, D, G

$R:$ G, D, F, E, D, C, G, D, G, E

$RR$: E, G, D, G, C, D, E, F, D, G

$T\_{8}: $C, D#, A#, D# G#, A#, C, C#, A#, D#