Symmetrical Fingerings: Alternatives to Traditional Scale and Arpeggio Approaches

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Table 1: Symmetrical Triad Pairs	
LH	**RH**
g	D
f♯	E♭
f	E
e	F
e♭	F♯
d	G
c♯	A♭
c	A
b	B♭
b♭	B
a	C
g♯	D♭
G	d
F♯	e♭
F	e
E	f
E♭	f♯
D	g
D♭	g♯
C	a
B	b♭
B♭	b
A	c
A♭	c♯

As shown in **figure 1**, the keyboard organizes symmetrically around two axes: D and A-flat. Any figure written for one hand can reflect across these axes to produce its mirror image in the other hand. Because human hands are symmetrical, this inversion around D or A-flat results in the same arrangement of black and white keys under the fingers.

Figure 1: The keyboard's two axes of symmetry, D and A-flat

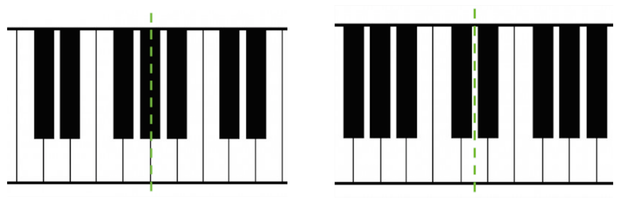


Figure 2: An F minor triad inverts across D to become an E major triad

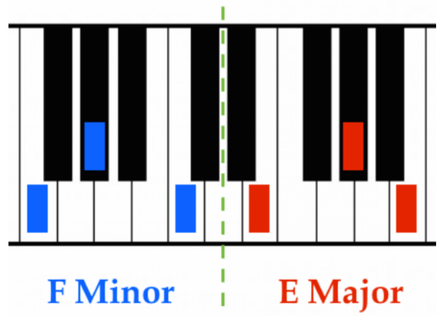
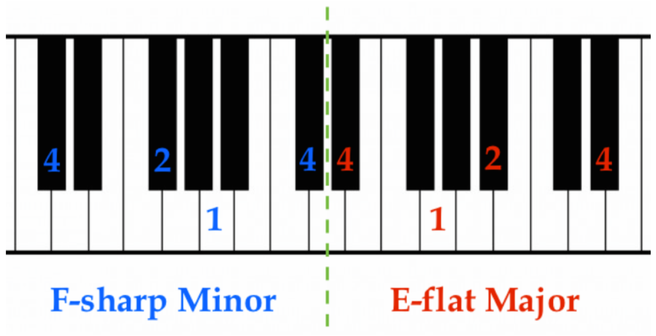


Figure 3: A left-hand F-sharp minor arpeggio inverts to a right-hand E-flat major arpeggio



Since major and minor triads are asymmetrical, they produce new pitch collections when inverted across these axes of symmetry: major triads invert to minor and minor triads to major. **Figure 2** shows how an E-major triad in the right hand reflects across D to form an F-minor triad in the LH. For this symmetrical triad pair, the physical layout of the keys under the hand remains constant, but the pitch collection differs. See **table 1** for a complete list of symmetrical triad pairs.

Table 2 illustrates the standard fingerings for all arpeggios in both hands organized in symmetrical pairs. Each distinct fingering pattern is highlighted in a different color. In order to provide exact inversions, the right-hand fingerings *ascend* one octave from tonic to tonic, and left-hand fingerings *descend* one octave from dominant to dominant. **Figure 3** represents two of these arpeggios visually on the keyboard.

Nearly all arpeggios that begin on black keys have symmetrical fingerings. The remaining, asymmetrical pairs predominately follow the pattern exemplified by the a/C pair shown in **figure 4**. To create a symmetrical fingering, the right hand should begin with finger 2 on tonic as shown in **figure 5**. The following right-hand arpeggios could benefit from this alternative approach: F, C, G, D, A, E, f, c, g, d, a, and e.

Figure 4: A left-hand A minor arpeggio inverts to a right-hand C major arpeggio, yet the standard fingering differs

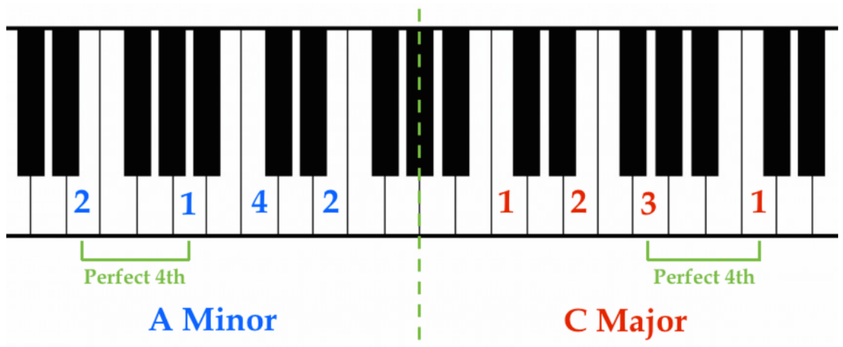


Figure 5: The right-hand C major arpeggio can mirror the finger of the left-hand A minor arpeggio

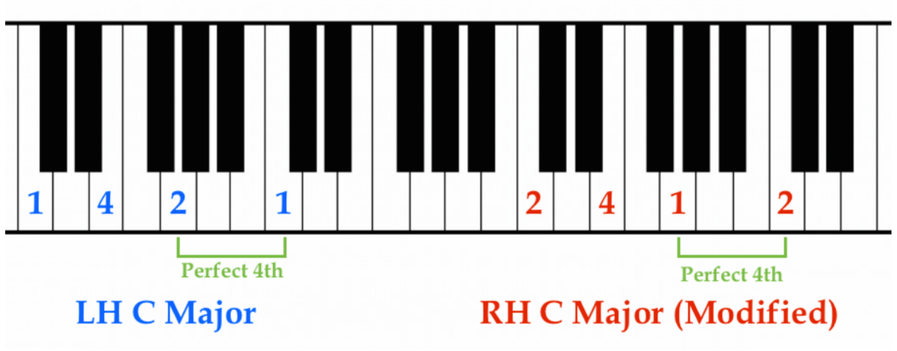


Table 2: Standard Arpeggios Fingerings by Symmetrical Key Pairs			
LH (descending $\hat{5}$ to $\hat{5}$)		**RH (ascending $\hat{1}$ to $\hat{1}$)**	
Key	**Fingering**	**Key**	**Fingering**
g	2 - 4 - 1 - 2	D	1 - 2 - 3 - 1
f♯	4 - 1 - 2 - 4	E♭	4 - 1 - 2 - 4
f	2 - 4 -1 - 2	E	1 - 2 - 3 - 1
e	2 - 4 - 1 - 2	F	1 - 2 - 3 - 1
e♭	2 - 4 - 1 - 2	F♯	1 - 2 - 3 - 1
d	2 - 4 - 1 - 2	G	1 - 2 - 3 - 1
c♯	4 - 1 - 2 - 4	A♭	4 - 1 - 2 - 4
c	2 - 4 - 1 - 2	A	1 - 2 - 3 - 1
b	2 - 4 - 1 - 2	B♭	4 - 1 - 2 - 4
b♭	1 - 2 - 3 - 1	B	1 - 2 - 3 - 1
a	2 - 4 - 1 - 2	C	1 - 2 - 3 - 1
g♯	4 - 1 - 2 - 4	D♭	4 - 1 - 2 - 4
G	2 - 4 - 1 - 2	d	1 - 2 - 3 - 1
F♯	2 - 3 - 1 - 2	e♭	1 - 2 - 3 - 1
F	2 - 4 - 1 - 2	e	1 - 2 - 3 - 1
E	2 - 3 - 1 - 2	f	1 - 2 - 3 - 1
E♭	4 - 1 - 2 - 4	f♯	4 - 1 - 2 - 4
D	2 - 3 - 1 - 2	g	1 - 2 - 3 - 1
D♭	4 - 1 - 2 - 4	g♯	4 - 1 - 2 - 4
C	2 - 4 - 1 - 2	a	1 - 2 - 3 - 1
B	2 - 3 - 1 - 2	b♭	2 - 3 - 1 - 2
B♭	1 - 2 - 3 - 1	b	1 - 2 - 3 - 1
A	2 - 3 - 1 - 2	c	1 - 2 - 3 - 1
A♭	4 - 1 - 2 - 4	c♯	4 - 1 - 2 - 4

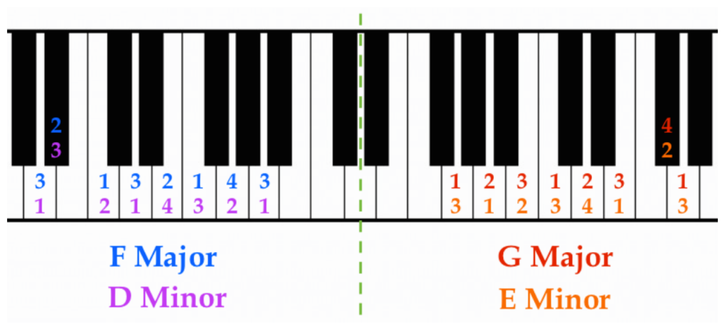
Scales present a wider set of fingering possibilities. **Table 3** shows standard fingerings for major scales, their relative minor scales, and their inversions: four distinct ways of understanding an identical pattern of black and white keys. To read the chart, start in the third column which shows the fingering for RH scales ascending from tonic to tonic. The first row shows a D major scale fingering from D to D: 1-2-3-1-2-3-4-1. That same collection of pitches can be understood as a B natural minor scale beginning on the third scale degree (fourth column), in which case the standard fingering is 3-1-2-3-4-1-2-3. If inverted across D, this pattern creates a B-flat major scale descending from the third scale degree (second column) with a standard fingering of 1-2-3-1-2-3-4-1. These pitches could also be interpreted as a G minor scale descending from the fifth scale degree (first column) with a standard fingering of 1-2-3-4-1-2-3-1. The configuration of black and white keys is the same in each case, but three different standard fingerings exist for the pattern.

Table 3: Standard Scale Fingerings

LH Descending ($\hat{5}$ to $\hat{5}$)		LH Descending ($\hat{3}$ to $\hat{3}$)		RH Ascending ($\hat{1}$ to $\hat{1}$)		RH Ascending ($\hat{3}$ to $\hat{3}$)	
g	1-2-3-4-1-2-3-1	B♭	1-2-3-1-2-3-4-1	D	1-2-3-1-2-3-4-1	b	3-1-2-3-4-1-2-3
f♯	3-1-2-3-4-1-2-3	A	3-4-1-2-3-1-2-3	E♭	3-1-2-3-4-1-2-3	c	3-1-2-3-4-1-2-3
f	1-2-3-4-1-2-3-1	A♭	1-2-3-1-2-3-4-1	E	1-2-3-1-2-3-4-1	c♯	1-2-3-1-2-3-4-1
e	1-2-3-4-1-2-3-1	G	3-4-1-2-3-1-2-3	F	1-2-3-4-1-2-3-1	d	3-1-2-3-4-1-2-3
e♭	2-3-4-1-2-3-1-2	F♯	2-3-4-1-2-3-1-2	F♯	2-3-4-1-2-3-1-2	e♭	2-3-4-1-2-3-1-2
d	1-2-3-4-1-2-3-1	F	3-4-1-2-3-1-2-3	G	1-2-3-1-2-3-4-1	e	3-1-2-3-4-1-2-3
c♯	3-4-1-2-3-1-2-3	E	3-4-1-2-3-1-2-3	A♭	3-4-1-2-3-1-2-3	f	3-4-1-2-3-1-2-3
c	1-2-3-4-1-2-3-1	E♭	1-2-3-1-2-3-4-1	A	1-2-3-1-2-3-4-1	f♯	1-2-3-1-2-3-4-1
b	4-1-2-3-1-2-3-4	D	3-4-1-2-3-1-2-3	B♭	4-1-2-3-1-2-3-4	g	3-1-2-3-4-1-2-3
b♭	1-2-3-1-2-3-4-1	D♭	1-2-3-1-2-3-4-1	B	1-2-3-1-2-3-4-1	g♯	1-2-3-1-2-3-4-1
a	1-2-3-4-1-2-3-1	C	3-4-1-2-3-1-2-3	C	1-2-3-1-2-3-4-1	a	3-1-2-3-4-1-2-3
g♯	2-3-1-2-3-4-1-2	B	2-3-1-2-3-4-1-2	D♭	2-3-1-2-3-4-1-2	b♭	2-3-1-2-3-4-1-2

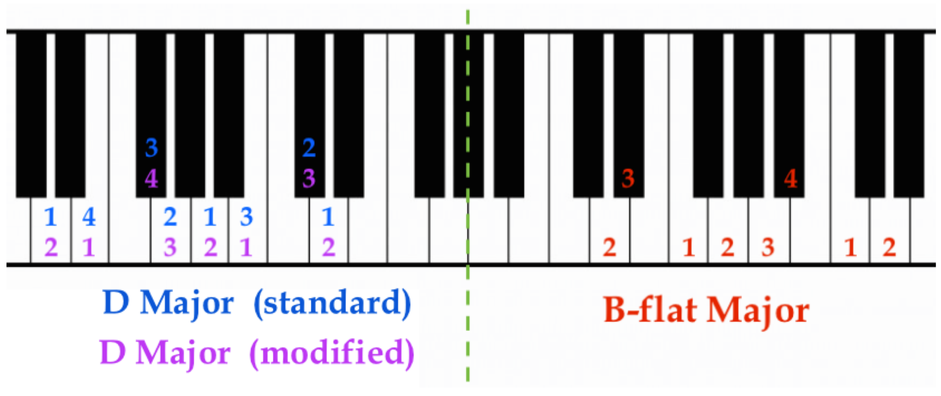
Scales that contain greater numbers of black keys have more fixed fingering traditions, with uniform fingerings across all four approaches to each pitch collection. Conversely, the scales that use the fewest black keys present unique fingerings for each of the four approaches (see **figure 6**). Variation in scale fingering stems from the prevailing tendency to place the thumb on scale degree 1 if it is a white key. This often forces the thumb to turn under finger 3 or 4 as it plays a white key, though a nearby black key may have provided an easier place to shift. In contrast, when the tonic pitch is a black key, traditional fingerings place the thumb on the first available white key.

Figure 6: Maximum fingering asymmetry demonstrated in right-hand G Major/E Minor and left-hand F Major/D Minor



Right-hand scale fingerings consistently coordinate the turning under of the thumb to follow finger 3 or 4 playing a black key. Left-hand fingerings more frequently require the thumb to turn under a white key, even when black keys are present. For example, in a D-major scale, the right hand thumb turns under when finger 3 plays F-sharp and finger 4 plays C-sharp. In the left-hand descent, the thumb turns under 3 on B and 4 on E. However, if the left-hand adopts the approach of B-flat major, its symmetrical counterpart, the thumb will then turn under C-sharp and F-sharp as shown in **figure 7**. The following left-hand scales could benefit from this approach: G, D, A, f, c, and g.

Figure 7: Left-hand D major scale fingering modified to match its symmetrical counterpart, right-hand B-flat major scale



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