

Title: A Suite: Pi
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Abstract: *A Suite: Pi* is seven musical compositions celebrating Pi Day. Each of the seven pieces is composed using a musical scale with the same number of notes as found in pi of the chosen base. The songs use pi in bases 5, 6, 7, 8, and 12, and the notation of pi is shown in each song.

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Date: January 15, 2019

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A Suite: Pi

Seven musical
compositions celebrating
Pi Day

March 14, 2015

9:26:53am

By Karama Neal

Forward

A Suite: Pi celebrates Pi Day 2015 with seven musical compositions based on the mathematical constant pi, the ratio of a circle's circumference to its diameter.

In our usual base ten, pi is the familiar 3.141592653. The digits go on both randomly and forever.

But in other number bases, pi is written with different digits. For example, in base five, pi is 3.032322143, again proceeding randomly and forever.

Just as base ten uses ten digits, base five uses only five digits: 0, 1, 2, 3, and 4.

Each of the seven pieces of *A Suite: Pi* is composed using a musical scale with the same number of notes as found in pi of the chosen base. So the songs for base five use a pentatonic scale with each note of the scale corresponding to one of the five digits used to write pi in base five. I chose the key and the rhythm, pi did the rest.

The seven pieces that follow are composed using pi in bases 5, 6, 7, 8, and 12, and the notation of pi is shown in each song. Thanks to Laurence Turner, PhD, for posting pi in various bases on his website.

The pieces use a pentatonic (5 note) folk scale, hexatonic (6 note) blues scale, heptatonic (7 note) major and minor scale, octatonic (8 note) jazz scale, and chromatic (12 note) scale.

Just as with the common major (heptatonic) scale - do re mi fa so la ti do - each scale used is set of musical notes ordered by their pitch. However, most of the chosen scales have more or fewer than seven notes. The notes and the intervals between them add to the character of each piece. Visit www.soundcloud.com/karamaneal to hear them.

Informed by the constraints presented by the math and the music, these seven pieces are my offering in celebration of the Pi Day of the Century.

I hope you enjoy these "*songs in the key of pi.*"

Karama Neal, PhD

March 2015

PiBase5 - Humble Pi

Karama Neal

♩ = 100

Musical notation for measures 1-5. The piece is in 4/4 time with a key signature of three sharps (F#, C#, G#). The bass line consists of a steady eighth-note pattern: C4, D4, E4, F#4. The treble line starts with a whole rest for the first two measures, then plays a half note G#4 in measure 3, followed by quarter notes A4, B4, C5 in measures 4 and 5. Fingering numbers are provided below the notes: 3. (triple), 0 3 2 3, 2 2 1.

6

Musical notation for measures 6-10. The bass line continues with eighth notes: G#4, A4, B4, C5. The treble line plays quarter notes: D5, E5, F#5, G#5 in measure 6; A5, B5, C6, D6 in measure 7; E6, F#6, G#6, A6 in measure 8; B6, C7, D7, E7 in measure 9; F#7, G#7, A7, B7 in measure 10. Fingering numbers are provided below the notes: 4 3 0, 3 3 4 3, 2 4 1, 1 2 4, 1 2 2.

11

Musical notation for measures 11-15. The bass line continues with eighth notes: C5, D5, E5, F#5. The treble line plays quarter notes: G#5, A5, B5, C6 in measure 11; D6, E6, F#6, G#6 in measure 12; A6, B6, C7, D7 in measure 13; E7, F#7, G#7, A7 in measure 14; B7, C8, D8, E8 in measure 15. Fingering numbers are provided below the notes: 4 0, 4 1, 4 0 2 3, 1 4 2 1, 1 1 4.

16

Musical notation for measures 16-20. The bass line continues with eighth notes: F#5, G#5, A5, B5. The treble line plays quarter notes: C6, D6, E6, F#6 in measure 16; G#6, A6, B6, C7 in measure 17; D7, E7, F#7, G#7 in measure 18; A7, B7, C8, D8 in measure 19; E8, F#8, G#8, A8 in measure 20. Fingering numbers are provided below the notes: 3 0 2 0, 3 1 0 0 2 2, 0 0 3 4 4, 4 1 3, 2 2 1 1.

0 1 0 4 0 3 3 2 1 3 4 4 0 0 4

3 2 4 4 4 0 1 4 4 1 0 4 2 3 3 4 1 3 3

0 1 1 3 2 3

PiBase6 - Blueberry Pi

Karama Neal

♩ = 173 Stomp or tap on beats 1 and 3.

6
3. 0 5 0 3 3 0 0 5 1 4 1 5 1 2 4

12
1 0 5 2 3 4 4 1 4 0 5 3 1 2 5 3 2 1 1 0

18
2 3 0 1 2 1 4 4 4 2 0 0 4 1 1 5 2 5 2

24
5 5 3 3 1 4 2 0 3 3 3 1 3 1 1 3 5 5 3 5 1

27
3 1 2 3 3 4 5 5 3 3 4

1 0 0 1 5 1 5 4 3 4 4 4 0

PiBase7 - Pibald

Karama Neal

♩ = 100

The first system of music consists of two staves. The upper staff is in treble clef with a key signature of two flats (Bb, Eb) and a time signature of 6/8. It contains five measures of music with various note values and rests. The lower staff is in bass clef with the same key signature and time signature, featuring a consistent eighth-note bass line. Below the upper staff, a series of numbers indicates the fret positions for the guitar: 3., 0 6 6 3, 6 5 1 4, 3 2 0 3, and 6 1 3 4 1 1 0.

6

The second system of music continues from the first, also consisting of two staves. The upper staff in treble clef contains five measures of music. The lower staff in bass clef continues the eighth-note bass line. Fret numbers are provided below the upper staff: 2 6, 3, 4 0 2 2 4 4, 6 5 2 2 2, 6 6 4 3, and 5 2 0. The system concludes with a double bar line.

PiBase5 - Mudpi

Karama Neal

♩ = 200

3. 0 3 2 3 2 2 1 4 3 0 3 3 4 3 2

5

4 1 1 2 4 1 2 2 4 0 4 1 4 0 2 3 1

9

4 2 1 1 1 4 3 0 2 0 - 3 1 0 0 2 2 0

13

0 3 4 4 4 1 3 2 2 1 1 0 1 0 4 0

Musical score for guitar, consisting of two staves. The top staff contains a melodic line with notes and accidentals. The bottom staff contains a bass line with notes and accidentals. Fret numbers are written below the notes in the top staff. The score is divided into two measures by a vertical bar line.

Measure 1 (Left):
Notes: G4 (0), A4 (5), B4 (6), C5 (4), D5 (6), E5 (8), F5 (8), G5 (0), A5 (1), B5 (8), C6 (1).
Fret numbers: 0 5 6 4 6 8 8 0 1 8 1

Measure 2 (Right):
Notes: G4 (7), A4 (7), B4 (7), C5 (7), D5 (7), E5 (7), F5 (7), G5 (7), A5 (7), B5 (7), C6 (7).
Fret numbers: X 3 6 8 3 0

PiBase7 - Pi in the Sky

Karama Neal

♩ = 100

The first system of music consists of five measures. The treble clef staff contains a melody with various note values and rests. The bass clef staff contains a bass line with a steady eighth-note accompaniment. Fingerings are indicated by numbers 0-4 below the notes. A triplet of eighth notes is marked with a '3.' in the first measure.

6

The second system of music consists of five measures. The treble clef staff continues the melody. The bass clef staff continues the accompaniment. Fingerings are indicated by numbers 0-4 below the notes. The system concludes with a double bar line.

PiBase8 - Piphilology

Karama Neal

♩ = 157

Musical notation for measures 1-7. The piece is in 3/4 time with a key signature of one sharp (F#). The notation includes a treble clef and a bass clef. Fingerings are indicated by numbers 1-5 below the notes. Measure 1 has a triplet of eighth notes (3. 1 1) in the treble and a whole note (0 3) in the bass. Measures 2-7 continue the melodic line in the treble with various fingerings, while the bass line provides harmonic support with whole notes and rests.

8

Musical notation for measures 8-14. The treble clef continues the melody with eighth and sixteenth notes, while the bass clef plays whole notes. Fingerings are indicated by numbers 1-5. Measure 8 starts with a triplet (2 1 5 1) in the treble and a whole note (4 2) in the bass. The piece concludes with a whole note (7 0) in the treble and a whole note (0 6) in the bass.

15

Musical notation for measures 15-20. The treble clef features a melodic line with eighth and sixteenth notes, and the bass clef plays whole notes. Fingerings are indicated by numbers 1-5. Measure 15 begins with a triplet (1 6 3) in the treble and a whole note (2 1 1) in the bass. The piece ends with a whole note (2 1 0) in the treble and a whole note (2 1 0) in the bass.

21

Musical notation for measures 21-26. The treble clef continues the melody with eighth and sixteenth notes, and the bass clef plays whole notes. Fingerings are indicated by numbers 1-5. Measure 21 starts with a triplet (5 1 4 7 6 3) in the treble and a whole note (0) in the bass. The piece concludes with a whole note (7 3 7 2 4 6) in the treble and a whole note (2) in the bass.

A musical score for guitar, consisting of six measures. The notation is written on a grand staff with a treble clef on the upper staff and a bass clef on the lower staff. The key signature has one sharp (F#). The notes in the treble staff are: Measure 1: G4, A4, B4; Measure 2: C5, B4, A4, G4; Measure 3: F#4, G4, A4; Measure 4: B4, C5, B4, A4; Measure 5: G4, F#4, E4, D4; Measure 6: C4. The bass staff contains: Measure 1: F#2; Measure 2: a whole rest; Measure 3: F#2; Measure 4: a whole rest; Measure 5: a whole rest; Measure 6: F#2. Fingerings are indicated by numbers 1-5 and 0 (open string) below the notes.

Measure	Treble Staff Notes	Bass Staff Notes	Fingerings
1	G, A, B	F#	1, 6, 6
2	C, B, A, G	Rest	1, 1, 6, 3, 3
3	F#, G, A	F#	1, 0
4	B, C, B, A	Rest	4, 5, 0, 5
5	G, F#, E, D	Rest	1, 2, 0, 2
6	C	F#	0