# Sonic Pi

*The Live Coding Music Synth for Everyone*

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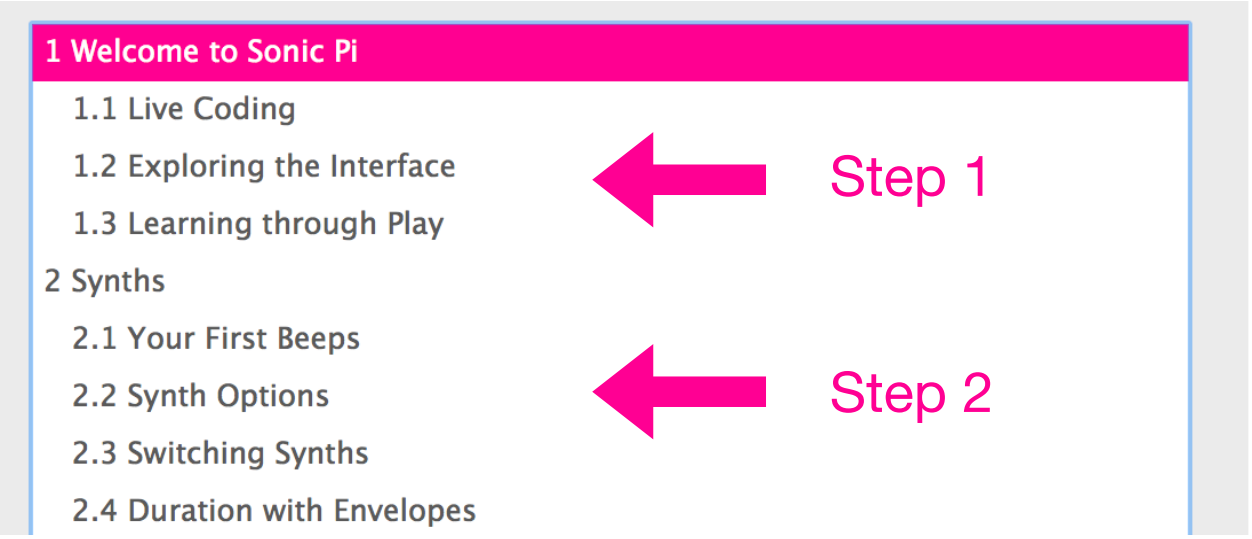
```
music_as :code
  code_as :art
```

There are no mistakes, only opportunities

C Major 7 arpeggio from ‘Stranger Things.’

```
use_synth :prophet
use_bpm 62

in_thread do
  with_fx :reverb do
    loop do
      play_pattern_timed chord(:C3, :M7), 0.2
    end
  end
end
```




**Starting Text Blocks to Code:**

Eminor Guitar Loop

```
live_loop :guit do
  with_fx :echo, mix: 0.3, phase: 0.25 do
    sample :guit_em9, rate: 0.5
  end
  #  sample :guit_em9, rate: -0.5
  sleep 8
end
```

---

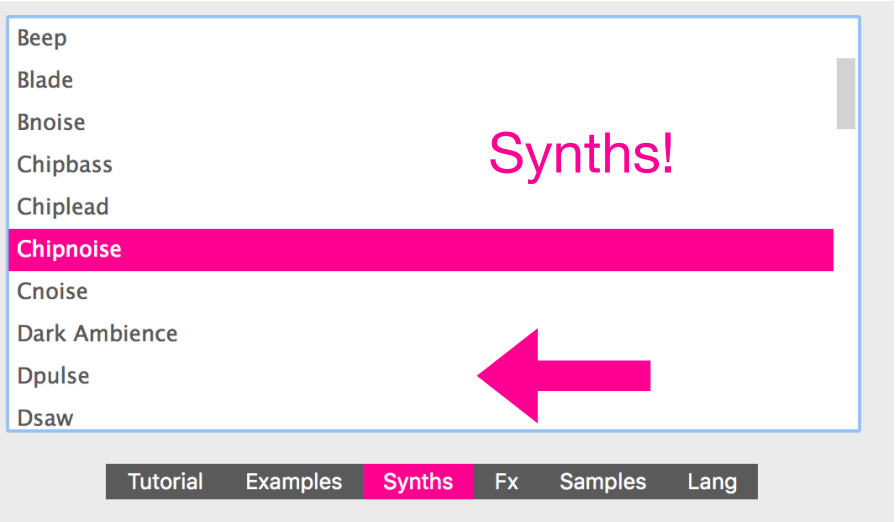
Repeats Twice

```
2.times do
  play 60
  sleep 0.5
  play 62
  sleep 0.5
  play 64
  sleep 0.5
  play 67
  sleep 0.5
  play 69
  sleep 0.5
end
```

| C | D | E | F | G | A | B |
|---|---|---|---|---|---|---|
| 60 | 62 | 64 | 65 | 67 | 69 | 71 |

Notes use numbers as above.

```
use_synth :fm
2.times do
  play 60
  sleep 0.5
  play 67
  sleep 0.5
end
```



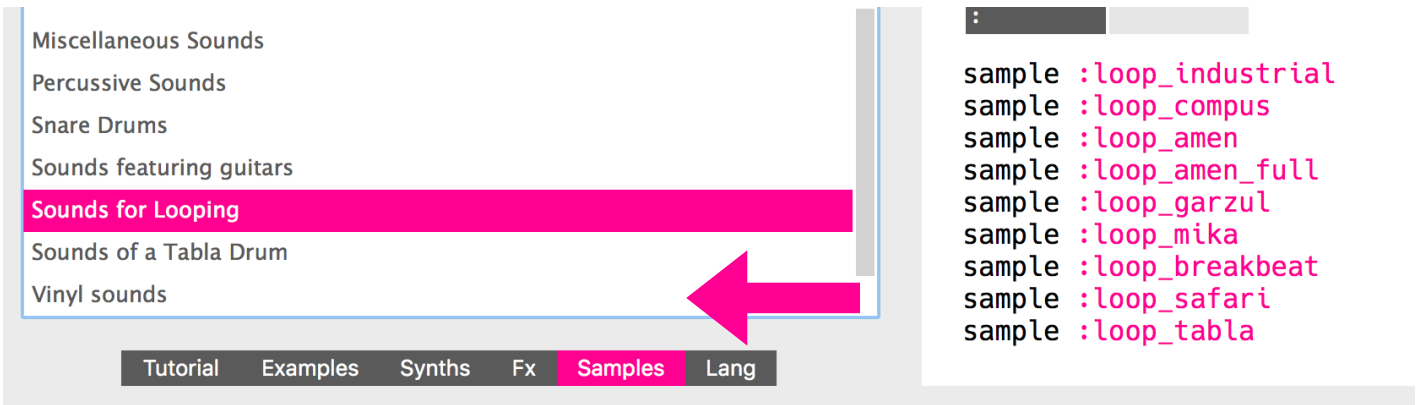

**Loops and Synths:**

Loops and Synths can be added to your patterns using the following commands.

To use a synth, you need to add the code `use_synth :name of synth` above the sequence of code you want to use it in.

To use a sample, you need to add the code `sample :name of sample` in the sequence of your music program where you want it to play. Just by typing **sample: loop_** a series of options will open up.

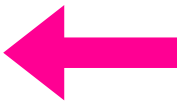
```
2.times do
  sample :loop_amen
  sleep 1.753
end
```



The code we use to play two tunes at the same time needs to be between `in_thread do` and `end`.

**More than one loop at once:**

```
in_thread do
  loop do
    sample :loop_amen
    sleep 1.753
  end
end
```



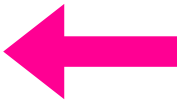
See how each time a ‘do’ is referenced there is an ‘end?’

Copy and paste the code below to now hear both at once:

```
in_thread do
  16.times do
    play 75
    sleep 1.753
    play 74
    sleep 0.25
  end
end
```

Can you add a synth sound above the 16. times do code?

```
in_thread do
  use_synth :tb303
  16.times do
    play 75
    sleep 1.753
    play 74
    sleep 0.25
  end
end
```



The synth option is up to you.

Here is an example of two loops playing at once.
**You can copy and paste them into the program**:

```
in_thread do
  use_synth :prophet
  16.times do
    play 75
    sleep 1.753
    play 74
    sleep 0.25
  end
end
in_thread do
  loop do
    sample :loop_amen
    sleep 1.753
  end
end
```

**Try to change the following**:

1. The synth sound
2. The loop sound
3. The timing of the notes or loop
4. The actual notes themselves

**Extension option**:

- Could you code a piano left hand pattern with a melody?
- Can you code a series of ostinato patterns?

Don't forget that copy & paste is a powerful tool. You can edit code, experiment and test ideas with this handout as your reference material.

The following two examples combine piano pieces with coding! The first is *Etude No.1* by Philip Glass and the second is *I'm going to make a Cake*.

```
use_synth :piano
use_bpm 80

in_thread(name: :triplets) do
  loop do
    4.times do
      play :G3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :D4
      sleep 0.2
    end
    4.times do
      play :G3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :Eb4
      sleep 0.2
    end
    4.times do
      play :Gb3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :Eb4
      sleep 0.2
    end
    4.times do
      play :Gb3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :F4
      sleep 0.2
    end
    in_thread do
      with_fx :reverb do
        play :G1
        sleep 2.4
        play :G1
        sleep 2.4
        play :Gb1
        sleep 2.4
        play :Gb1
      end
    end
  end
end
```


```
use_synth :piano
use_bpm 80

in_thread(name: :triplets) do
  loop do
    4.times do
      play :G3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :D4
      sleep 0.2
    end
    4.times do
      play :G3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :Eb4
      sleep 0.2
    end
    4.times do
      play :Gb3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :Eb4
      sleep 0.2
    end
    4.times do
      play :Gb3
      sleep 0.2
      play :Bb3
      sleep 0.2
      play :F4
      sleep 0.2
    end
    in_thread do
      with_fx :reverb do
        play :G1
        sleep 2.4
        play :G1
        sleep 2.4
        play :Gb1
        sleep 2.4
        play :Gb1
      end
    end
  end
end
```

This example uses the alternating minor 3rd of A and C in the left hand. What other notes can you play over this ostinato pattern?

```
use_synth :piano
use_bpm 126
play [:A3, :C3, :E3]

in_thread do
  32.times do
    play :C4
    sleep 0.5
    play :A3
    sleep 0.5
  end
end
use_synth :pretty_bell
in_thread do
  with_fx :reverb, room:8 do
    play :E4
    play :E5
    sleep 8
    play :F4
    play :F5
    sleep 8
  end
  use_synth :piano
  in_thread do
    with_fx :reverb do
      play :A6
      play :A5
      sleep 4
      play :E6
      play :E5
      sleep 4
      play :F6
      play :F5
      sleep 4
      play :C6
      play :C5
      sleep 4
    end
  end
end
```

```
use_synth :piano
use_bpm 126
play [:A3, :C3, :E3]

in_thread do
  32.times do
    play :C4
    sleep 0.5
    play :A3
    sleep 0.5
  end
end
use_synth :pretty_bell
in_thread do
  with_fx :reverb, room:8 do
    play :E4
    play :E5
    sleep 8
    play :F4
    play :F5
    sleep 8
  end
  use_synth :piano
  in_thread do
    with_fx :reverb do
      play :A6
      play :A5
      sleep 4
      play :E6
      play :E5
      sleep 4
      play :F6
      play :F5
      sleep 4
      play :C6
      play :C5
      sleep 4
    end
  end
end
```