Build a Band Card 1

How do you build up your own tune? Can you code your own band? Let's take it a step at a time.

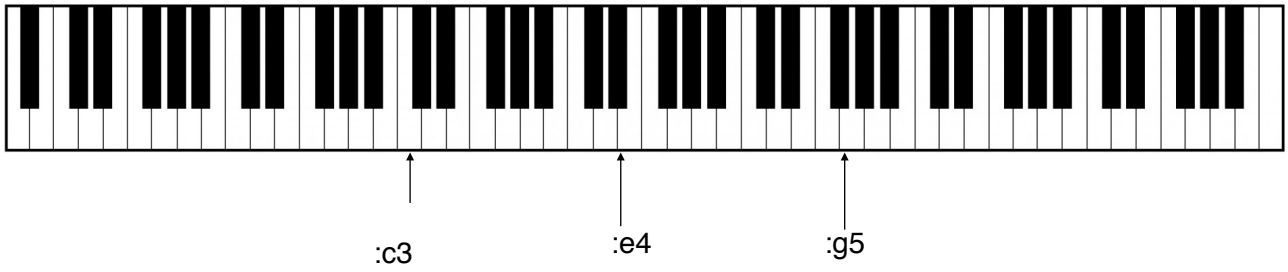
Write a tune

Start by clicking into a **buffer 1**, choosing a synth and playing a couple of notes using it:

Type in the commands:

```
use_bpm 90
use_synth :tb303
play :e3
sleep 2
play :d3
sleep 0.5
play :e3
sleep 1
play :c3
sleep 1
```

This will play the note E, followed by the note D, then E, then C. The 3 means that it's the 3rd C, D, and E you'd find on a piano.



Click the **Run** button to hear it and the **Stop** button to stop

Try changing the note name (:a,:b,:c,:d,:e,:f,:g) or how far along the keyboard it is (1, 2, 3, 4, 5, 6, 7).

The command `sleep 1` means the computer waits 1 beat before playing the next note.

What happens if you make this number **smaller** (between 0.05 and 1.5)? Or **larger** (between 3 and 10)?

Code some beats

Most bands have a drummer. So in **buffer 2** let's add a drummer using some samples:

```
sample :drum_heavy_kick
sleep 0.5
sample :drum_tom_mid_hard
sleep 0.25
sample :bd_haus
sleep 0.25
```

If you want you can change the samples or the numbers after the `sleep` commands.

Add some bass

In **buffer 3** code a bass player for our band:

```
sample :bass_trance_c, rate:1
sleep 2
```

The `amp:` setting controls how **loud** the sample is.

The `rate:` setting controls the **speed** the sample is played at.

What happens if you change the number after `rate:` ? Try:
- a **higher** number (between 1 and 5)
- a **lower** number (between 0 and 1)
- a **negative** number, e.g. -1

We've now got all the parts of our band, but:

1. they're a bit lazy (only playing a couple of notes/samples)
2. they appear to have fallen out and are all playing in different rooms

In the next card we'll see how to fix these problems!

We can use something called a **loop** to make our musicians keep on playing rather than stopping after a couple of notes.

A loop is a command that does something over and over again (which saves a lot of typing).

Loop it - Tune

The particular sort of loop we'll use is called a `live_loop`. Each live_loop needs a name, and it has to be different from the name of any other live_loop. So that we know what our loop is doing we'll give it the name `:tune.`

```
use_bpm 90
live_loop :tune do
  use_synth :tb303
  play :e3
  sleep 2
  play :d3
  sleep 0.5
  play :e3
  sleep 1
  play :c3
  sleep 1
end
```

Everything between the words `do` and `end` will be repeated over and over until you click **Stop**.

The best thing about a `live_loop` is that you can edit it and change the sound **without stopping the music**.

Make a change to the code - a different synth, or different notes - then just hit **Run** to update the sound as it plays (it might take a few seconds).

Loop it - Beats

Lets add a `live_loop` to our drum sound and call it `:beats`

```
live_loop :beats do
  sample :drum_heavy_kick
  sleep 0.5
  sample :drum_tom_mid_hard
  sleep 0.25
  sample :bd_haus
  sleep 0.25
end
```

Loop it - Bass

Now add a `live_loop` to our bass sound and call it `:bass`

```
live_loop :bass do
  sample :bass_trance_c, rate:1
  sleep 2
end
```

Get the band together

We've now got all three members of our imaginary band playing - but they're still each in a room by themselves.

Bring them together by copying and pasting the `:tune` loop, the `:beats` loop, and the `:bass` loop all into **buffer 4**. Now click **Run** and see how they sound!

You can hear that all the loops are now playing at the same time, like a real band. But it sounds a bit repetitive after a while. Lets look at a few things you can do to make it more interesting.

Add FX

Add some Effects (FX for short) to your live_loops using `with_fx`

```
live_loop :beats do
  with_fx :echo  do
    sample :drum_heavy_kick
    sleep 0.5
    sample :drum_tom_mid_hard
    sleep 0.25
    sample :bd_haus
    sleep 0.25
  end
end
```

Options

Remember that because you're using live_loops you don't have to stop the program to hear the effect of your changes. Just click **Run** again.
Options (or Opts for short) let you adjust the sounds of synths and samples. We saw some in the last card with amp: and release: Some others to try are:

`pan:` changes what speaker the sound comes from
-1 is left, 0 is both, 1 is right

```
sample :bd_haus, pan: -1
```

`cutoff:` A low cutoff lets you hear only lower frequencies in the sound, a high one lets through high parts of the sound. Try values between 50 and 120

```
sample :drum_tom_mid_hard,cutoff: 90
```

Randomise

The **`choose`** command chooses one of the notes in between the square brackets at random each time round the loop:

```
live_loop :tune do
  use_synth :hoover
  play [:c4,:e4,:g4].choose, release: 0.25
  sleep 0.25
end
```

The Opt `release:0.05` makes the note sound for only 0.05 beats so that the notes are very short, with a bigger gap between them. Try removing `release: 0.05` and see what happens.

The notes played aren't actually random - Sonic Pi uses a maths function to make it seem random to humans.

This means that your piece will sound the same every time it's run.

Make it yours

Now it's time to change what the band are playing - add more drums, change samples, add FX.

Write your own tune, use a bit of "Shake it Off", or have a go at typing in the code for a song you like by your favourite singer.

Here are some other songs you could look at for ideas:

"Running up that Hill" http://bit.ly/sonichill

"Get Lucky" http://bit.ly/luckypi

"Let it Go" http://bit.ly/letgopi