Sonic Pi – Completing your training

1 Credits

These materials were created by borrowing liberally from:

https://projects.raspberrypi.org/en/projects/getting-started-with-sonic-pi

https://coderdojo-nijmegen.nl/wp-content/uploads/2015/04/LES-1-Sonic-Pi-Je-eerste-geluiden-met-Sonic-Pi.pdf

http://kata.coderdojo.com/wiki/Sonic_Pi_Doctor_Who

2 What you will make

Sonic Pi is an open-source programming environment, designed for creating new sounds with code in a live coding environment; it was developed by Dr Sam Aaron (http://sam.aaron.name/) at the University of Cambridge. He uses the software to perform live with his band. This resource will help get you started with the basics of Sonic Pi so that you can code your own music.

3 Before you begin

- Make sure you have installed Sonic Pi
- Make sure you have completed **Getting Started with Sonic Pi**
- Make sure you have completed **Next Steps with Sonic Pi**

4 What you will learn

By following this Sonic Pi tutorial on your computer, you will learn:

- How to change the sounds by using different samples
- How to add effects and use parameters to change the way notes sound
- How to use randomization within a composition.

5 Step by Step instructions

5.1 Sushi 6 - Use samples

Not only can you create music in Sonic Pi using single notes, you can also create music with samples. Samples are pre-recorded sounds or tunes that you can bring into your music. This is a really simple way to make your music sound amazing!

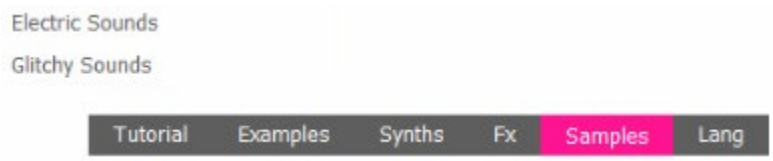
To use a sample, you need to add the code `sample :name of sample` in the sequence of your music program where you want it to play.

In this example, `loop_amen` is the name of the sample:

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

5.1.1 Samples to try

There are lots of samples included with Sonic Pi. To find the names of them, click on help followed by samples on the left-hand side of the help window. Click on any of the sample names to get more information on how to use it.



You can also create and use your own samples. Every audio file on your computer can be played as a sample; just record a sound using the microphone on your computer, save the file and play it later with the sample command.

```
sample 'C:/Windows/Media/Alarm04.wav'
```

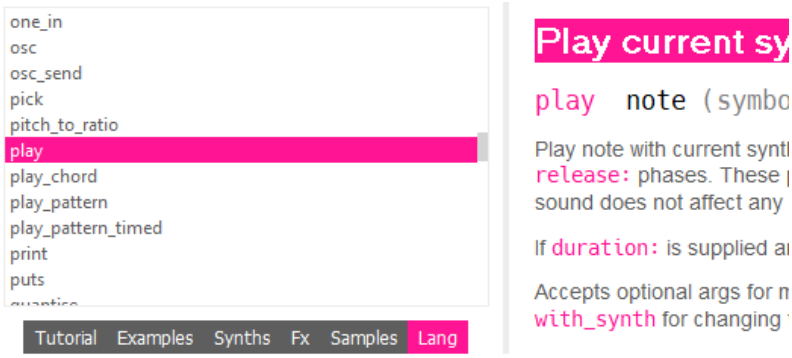
for example, plays a pre-installed windows alarm sound.

5.2 Sushi 7 - Modifying Parameters

On occasion, you might like to make sounds play for a longer time or at a different rate. This can be achieved easily by modifying the parameters of the code you are using.

Take `play 60`, for example.

Click on help to open the help documents, scroll down and select `lang` on the bottom, and scroll down to play.



You will see some examples of its use. So far you have used `play` without any parameters; let's use some now.

In a new worksheet type:

```
play 60, attack: 1, release: 3
```

Press the play button to hear how that one note sounds. Attack and release control the amplitude of a note over time, or in layman's terms, how loud a note will sound over time.

Now change the values for `attack` and `release` to see how those parameters affect the note.

There are lots of parameters that can also change the way samples or synths sound. Try changing the values for `cutoff:, pan:, rate: or amp:.`

For a full list of parameters for each sample, click on the Help icon, followed by Samples. Select a sample and scroll down to see a full explanation for each type of parameter that can be used with that sample. The same applies for synths!

5.3 Sushi 8 - Adding effects

Modern synthesizers can add effects to sounds. Sonic Pi is no different: you can add studio effects such as reverb, echo and distortion. Of course, you must use code to add the effects!

In a new worksheet find a sample that you like, for example `sample :guit_e_fifths`

Wrap the sample in an effects block like this:

```
with_fx :reverb do
  sample :guit_e_fifths
end
```

You can add effects on top of effects like this:

```
with_fx :reverb do
  with_fx :distortion do
  sample :guit_e_fifths
  end
end
```

Play around with some effects and add them to your music. Remember that a complete list of effects can be found in the help section of Sonic Pi under Fx.

5.4 Sushi 9 - Using rrand

Sonic Pi includes several functions that can add more interesting elements to your music. A fun function is `rrand`, which will return a value between two specified numbers. For a cool effect, use `rrand` to make the cutoff bounce around.

In a blank worksheet type:

```
loop do
  play chord(:a3, :minor).choose, attack: 0, release: 0.3,
                                                  cutoff: 80
  sleep 0.2
end
```

Instead of passing a number like 80 to the cutoff value, try `rrand(40, 120)` like this:

```
loop do
  play chord(:a3, :minor).choose, attack: 0, release: 0.3,
                                       cutoff:rrand(40, 120)
  sleep 0.2
end
```

Then you can start to experiment using `rrand` with other parameters. For example, add `pan:rrand(-1, 1)` to the play chord line and then press play. Pan selects the stereo position of the sound. -1 is left, 0 is in the middle and 1 is on the right.

6 What next?

Now you have the basics and you can make your own tune. Play around with some samples, make your own drumbeat using the sample loop_amen from above, add a bass line. Have fun.

If you are stuck for ideas, you can follow the CoderDojo York Sonic Pi Kata and write some code to do a Jungle version of the Doctor Who theme tune!

7 Day 4 – Challenge Number 3

- Use samples to add a cool beat to your creations
- Add effects to your synths and samples to make them sound cool
- Try looping some samples and use random notes to make weird music

As each day, save your work and give yourself a big hand for a job well done!