

HOW TO TURN DATA INTO CODE

AN INTRODUCTION TO SONIC PI



WHAT'S SONIC PI?

"The live Coding Synth for Everyone"

- Write code to make music
 - Open Source, created by: Sam Aaron
- Power of Code brought into music production

SOFTWARE WALKTHROUGH

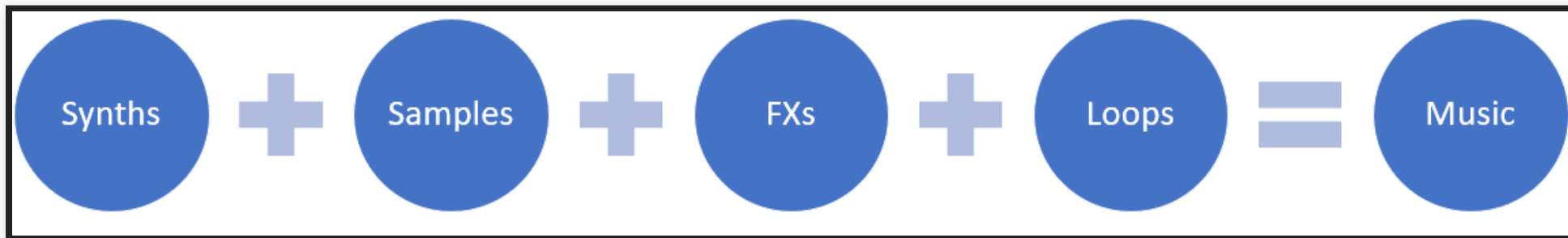
A woman with blonde hair, wearing a light blue sweater and a pink bow, is standing in a kitchen. She is pointing her right index finger towards a screen that is partially visible behind her. The kitchen has dark brown wooden cabinets and several round, metallic pendant lights hanging from the ceiling. In the foreground, there is a grey countertop with a small silver object on it. To the left, there are some green and yellow fruits in a bowl.

LET'S CODE A SONG!

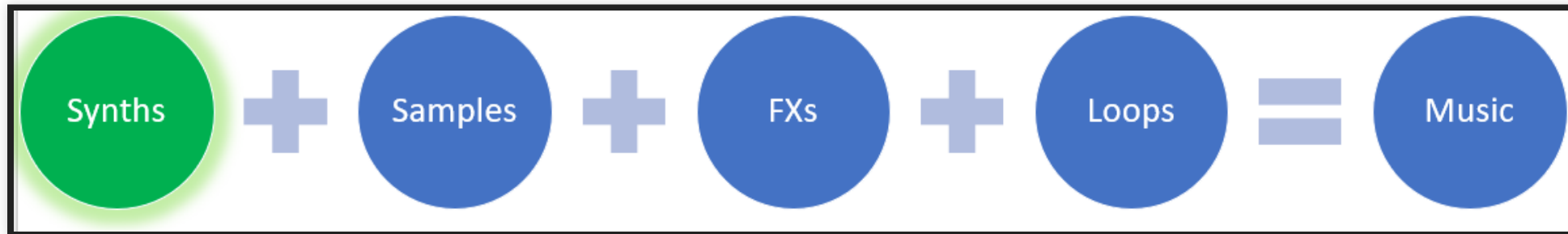
BASIC FEATURES

MUSIC PRODUCTION IN SONIC PI

Simple equation...



SYNTHS



WHAT'S A SYNTH?

- Electronic instrument that produces notes
- Sonic Pi brings 42 different synthesizers

A cartoon illustration of Daffy Duck in a tuxedo, playing a xylophone on a stage. He is holding mallets and looking at a music stand with a sheet of paper that says "ENDEARING YOUNG MAAME". The xylophone is on a green cloth-covered stand with "BBB" written on it. The background is a red curtain.

DEMO: SYNTHS



PROGRAMMING FEATURES

- Sonic Pi has all classic programming features

- Loops

```
N.times do .. end || live_loop :melody do .. end
```

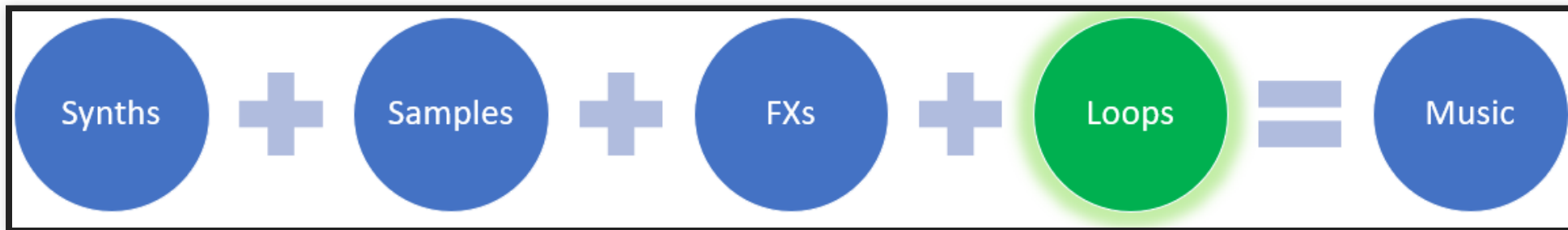
- Conditions

```
one_in(N) do .. end || if do .. end
```

- Variables

- Randomization allows explorative creation of music

LOOPS



DATA STRUCTURES

SCALES

```
(scale :C3, :major) # => :C3,:D3,:E3,:F3..
```

```
(scale :C3 , :major, num_octaves: 2) # => :C3,:D3,:E3,.. :C4,.
```

CHORDS

```
(chord :C3, :major) # => :C3, :E3, :F3
```

```
(chords :C3 , :major, num_octaves: 2) # => ..
```

RING/LISTS

```
(ring :C3, :F3, :G3) # => [:C3, :F3, :G3, :C3 , :F3 , ..]
```

```
(ring :C3, :F3, :G3).tick # => one note after the other
```

```
(ring :C3, :F3, :G3).choose # => random note
```

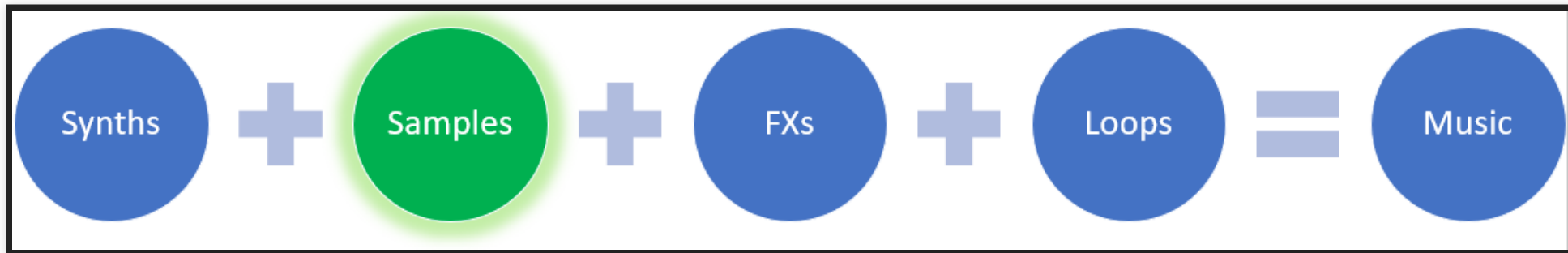
RANDOMIZATION

```
use_random_seed 2497
```

```
rrand(1,10) # => random number
```

```
rrand_i(1,10) # => whole random number
```


SAMPLES



- Sound pieces used in music (*sampling*)
- Sonic Pi brings 150 samples from various sources

Examples:

- Vocal Samples
- ambient sounds
- played instruments

SAMPLING IN POPULAR MUSIC

WhoSampled.com reveals samples in popular songs

- [Example 1: Gorillaz - Feel Good Inc.](#)
- [Example 2: Kate Perry ft. Nicky Minaj - Swish Swish](#)
- [Example 3: Michael Jackson - Beat It](#)

MANIPULATING SAMPLES

- loudness of sample:

```
amp: 0.5
```

- position of sound:

```
pan: -1
```

- play rate:

```
rate: -1
```

MANIPULATING SAMPLES

- beat_stretch:

```
beat_stretch: -1
```

- ADSR:

```
attack: 0.1, release: 0
```

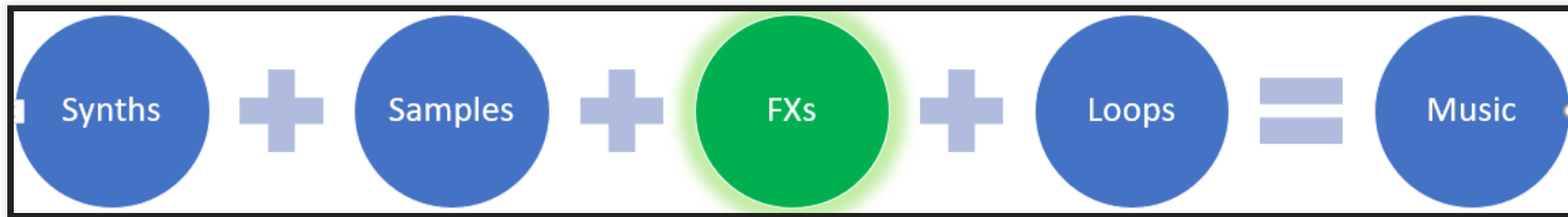
- Slicing sample:

```
start: 0.25, finish: 0.
```

A person is sitting at a bar, leaning forward with their head resting on their hand. In the background, a dartboard is visible on the wall, and a bottle of beer is on the bar counter. The scene is dimly lit, with light coming from a window or doorway in the background.

DEMO: SAMPLES

FX



- Additional effects for your composition, e.g.:

- ```
with_fx :reverb do .. end
```

- ```
with_fx :echo do .. end
```

- ```
with_fx :distortion do .. end
```

- ```
with_fx :slicer do .. end
```

- can be customized by options
- can be nested
- ~40 effects

DEMO: FX

OSC: A PEEK UNDER THE HOOD

OPEN SOUND CONTROL

- Sonic Pi starts a (local) server (standard port: 4559)
- Send/Receive messages from external sources
 - clients in the same network
 - local scripts

POSSIBLE USE CASES

- sensor-based instruments
- mapping non-music data to music
- sensors that influence aspects of music
- lan/wan "orchestra"

DEMO: OSC

