

# EarSketch: Loops and Conditionals

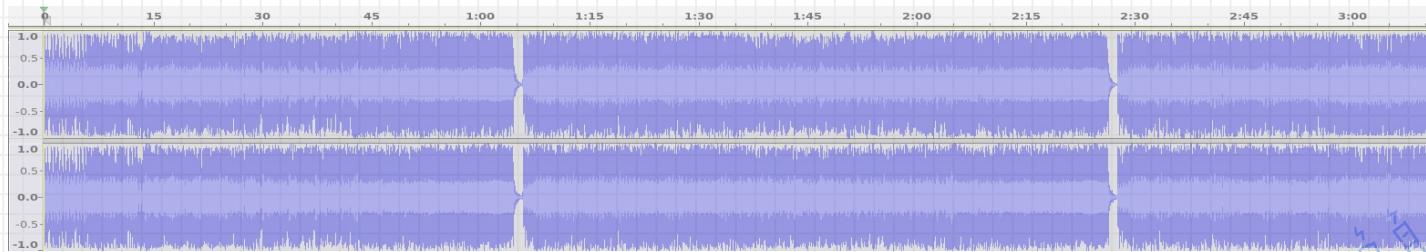


- Recap intro session
- Loops and conditionals to enhance your music

# Coding Repetition

## Looping Example 1:

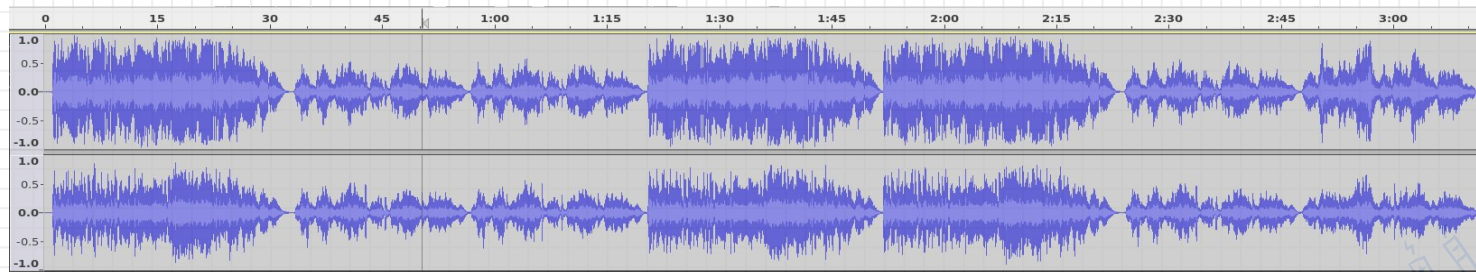
*Your favorite Song...which also happens to illustrate a few loops!*



# Coding Repetition

## Looping Example 2:

Here is another song...does it have loops?



# Looping Code Comparison

```
drum1 = ELECTRO_DRUM_MAIN_BEAT_008
drum2 = ELECTRO_DRUM_MAIN_BEAT_007

fitMedia(drum1, 1, 1, 1.5)
fitMedia(drum2, 1, 1.5, 2)
fitMedia(drum1, 1, 2, 2.5)
fitMedia(drum2, 1, 2.5, 3)
fitMedia(drum1, 1, 3, 3.5)
fitMedia(drum2, 1, 3.5, 4)
...
fitMedia(drum1, 8, 8.5)
fitMedia(drum2, 8.5, 9)
```

```
# loop_demo_1.py
drum1 = ELECTRO_DRUM_MAIN_BEAT_008
drum2 = ELECTRO_DRUM_MAIN_BEAT_007

for measure in range (1, 9):
    fitMedia(drum1, 1, measure, measure + 0.5)
    fitMedia(drum2, 1, measure + 0.5 , measure + 1)
```

# Loop Exercises (1)

- Run the previous loop demo after adding a print statement

```
for measure in range(1, 9):  
    fitMedia(drum1, 1, measure, measure + 0.5)  
    fitMedia(drum2, 1, measure + 0.5, measure + 1)  
    print measure
```

- Draw out what is happening on paper (or board)

measure	drums1 start = measure	drums1 end = measure + 0.5	drums2 start = measure + 0.5	drums2 end = measure + 1



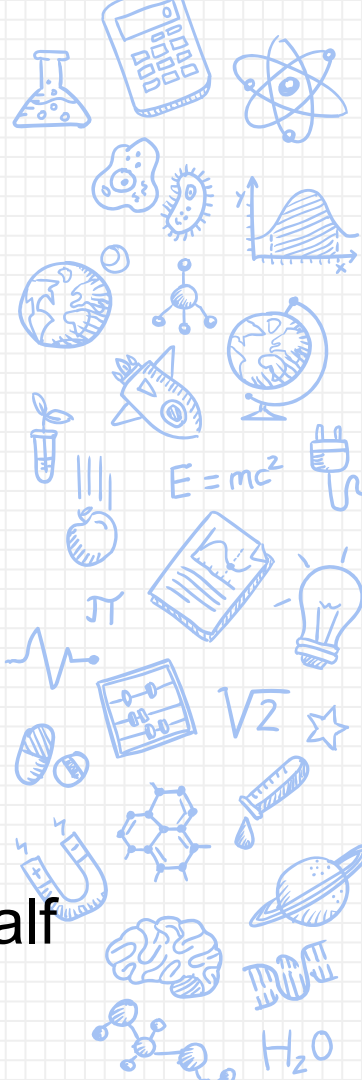
# Loop Exercises (2)

Draw the music for the following code:

```
#loop_demo_2.py
setTempo(128)
drum1 = ELECTRO_DRUM_MAIN_BEAT_008
bass1 = ELECTRO_ANALOGUE_BASS_003
bass2 =

for measure in range (1, 9):
    fitMedia(drum1, 1, measure, measure + 1)
    fitMedia(bass1, 2, measure, measure + 0.5)
```

Add another bass instrument to fill in the missing half measures







# For Loop

## (Control Flow Structure)

measure: Loop  
Counter Variable

Range Function  
(Note: goes through  
loop from 1 to 8)

Colon is used in  
Python to indicate  
indent of loop body

Loop Body  
(indented)

```
for measure in range (1, 9):  
    fitMedia(drum1, 1, measure, measure + 0.5)  
    fitMedia(drum2, 1, measure + 0.5 , measure + 1)  
  
fitMedia(piano1, 2, 1, 9)
```

Not in loop  
(not indented)

# Loop Exercise (4)

Play the following script. Note the difference from loop\_demo\_2

```
#loop_demo_3.py
init()
setTempo(128)
drum1 = ELECTRO_DRUM_MAIN_BEAT_008
bass1 = ELECTRO_ANALOGUE_BASS_020
for measure in range (1, 9, 2):
    fitMedia(drum1, 1, measure, measure + 2)
    fitMedia(bass1, 2, measure, measure + 1)
finish()
```

Third argument in range is the step size: 1,3,5,7

Again, add another bass in the empty measures (on the same track as bass1)

Our programs can make decisions based on some condition.



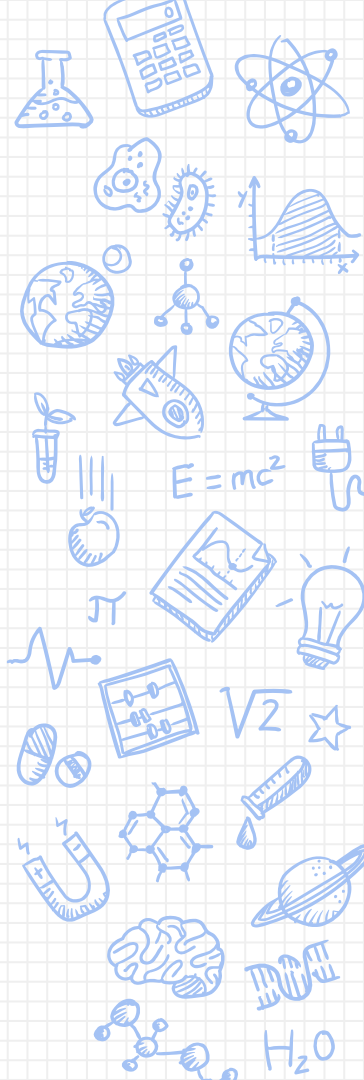
**Example:** To alternate behaviour every iteration of a loop to make the music more varied

# Conditionals

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In Python

```
if(x == 5):  
    fitMedia(piano1, 3, start, end)  
else:  
    fitMedia(piano2, 3, start, end)
```



```
#see loop_demo_4.py
```

```
drum2 = HOUSE_BREAKBEAT_022
```

```
for measure in range(start,end):
```

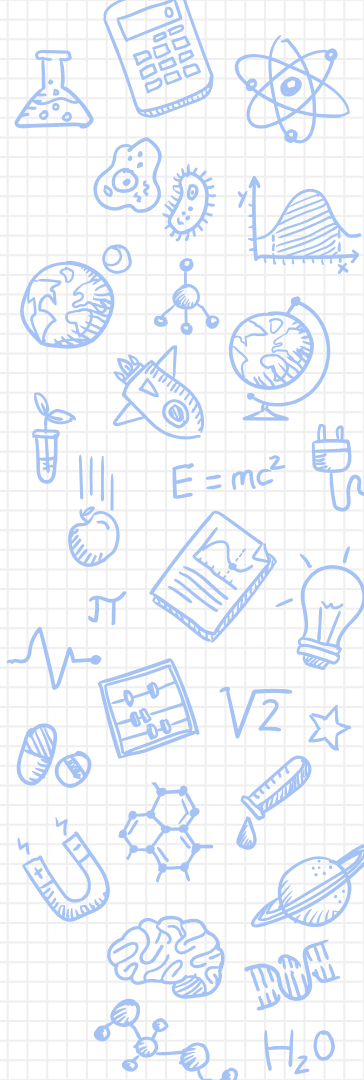
```
fitMedia(drum2, 2, measure, measure + 1)
```

We want to vary the piano part every other measure

# Conditionals Exercise (1) contd.

Pick another piano and use an if statement to alternate between the two every other measure

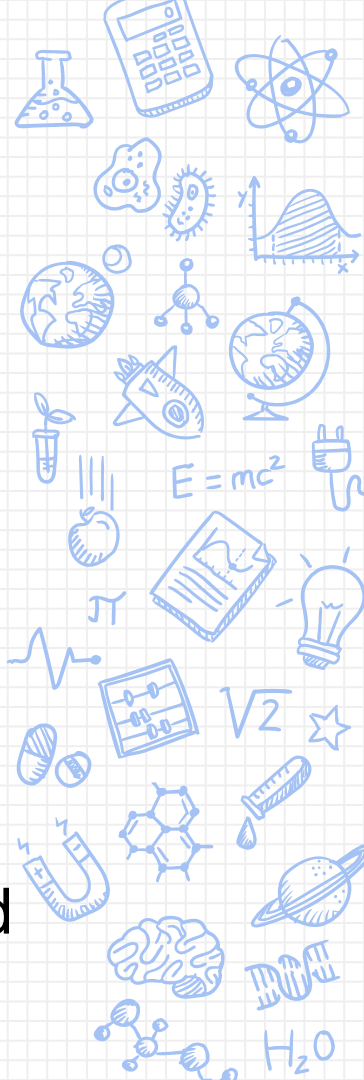
```
// the code before same as before
piano2 = HOUSE_ACOUSTIC_PIANO_005
for measure in range(1, 9):
    fitMedia(drum1, 1, measure, measure + 1)
    fitMedia(drum2, 2, measure, measure + 1)
    if (measure % 2 == 0):
        fitMedia(piano1, 3, measure, measure + 1)
    else:
        fitMedia(piano2, 3, measure, measure + 1)
```



# Conditionals Exercise (2)

---

1. What if we want to switch to the second piano every *third* measure?
2. What if we want to switch between `piano1` and `piano2` every other measure during measures 1-8 and then switch between `piano1` and `piano3` during measures 9-16?
3. Add a volume gain effect to have the drums start up slowly and fade away at the end
4. Another nice effect is to stagger the start and end of instruments (See `loop_demo_5.py`)



## More info on loops

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Tutorial section Unit2, Ch 12 - Looping.

