Computational Literacy Proposal
EarSketch
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Topic Area:
Want to learn how to code but find it boring? Does learning Python sound cool but intimidating? In this two hour workshop, you will learn the basics of python, all while creating music! We will use a program called EarSketch to teach computational ideas with the underlying motivation to create an awesome song!

Learning Objectives:
1. Learn the basic principles of coding in python.
2. Enter the mindset of a programmer.
3. See how code can be used in the arts and other fields.

What is EarSketch?
Earsketch is an NSF sponsored research project being run out of Georgia Tech in order to increase computational interest and understanding by incorporating music into computational theory. This falls in line with the STEAM philosophy (incorporating Arts into the teaching of STEM concepts). Earsketch[1] is a web-based program that is freely available online. It appears like many coding IDEs. Users can code in either Python or JavaScript.

Procedure:

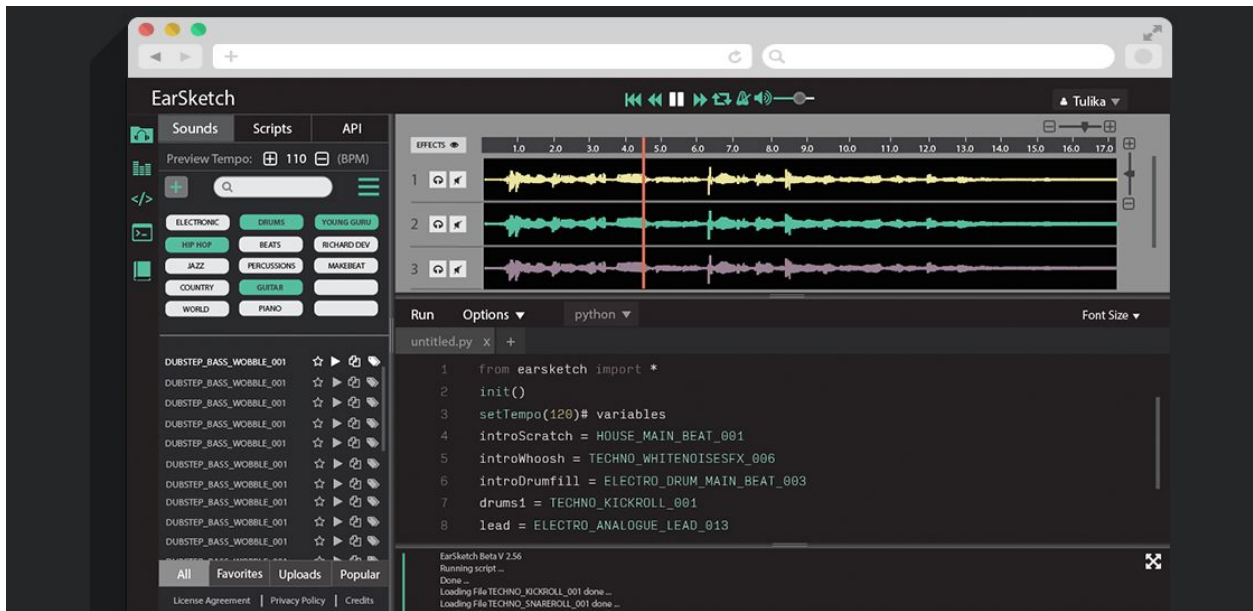| Elapsed Time (min)	Length of Section	What type of section	Description of section
0-5	5 Min	Talk to full class	Introduction to who we are
5-10	5 Min	Demo for class	Demo of Earsketch and what they will be able to do by the end of the workshop
10-20	10 Min	Talk to full class	Introduction to the IDE and what components are there (script, console, DAW)
20-25	5 Min	Talk to full class	Introduction to putting a sound clip in the script/DAW

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[1] https://earsketch.gatech.edu/earsketch2/

25-35	10 Min	5 minutes independent experiments, and then 5 minutes working as pairs	Student try putting a sound clip in the script and DAW
35-40	5 Min	Talk to full class	Introduction to loops
40-50	10 Min	5 minutes independent experiments, and then 5 minutes working as pairs	Student try putting a loop in their script
50-60	10 Min	Talk to full class	Introduction to functions
60-75	15 Min	5 minutes independent experiments, and then 10 minutes working as pairs	Students try putting functions into their script
75-85	10 Min	Talk to full class	Introduction to different data types
85-95	10 Min	Independent/small group experiment	Students try making a beat string in their code
95-105	10 Min	Independent/small group experiment	Students free to experiment with other coding principles in EarSketch
105-120	15 Min	Full class	Ask 2-3 students to volunteer to share their code/music with the class followed by discussions on different computational theory elements used/to be used in their code.

How components are achieving the learning objectives:

Bios:
Jamie and Elham are both PhD students in TIDAL (Tangible Interaction Design and Learning) Lab working under Michael Horn. Jamie is a 1st year in the Technology and Social Behavior Program focusing on the ways to use educational technologies for project-based and hands-on learning. She is also advised by Matt Easterday. Elham is a last-year PhD candidate in Computer Science and her research focuses on designing interactive learning tools and science museum exhibits for children. She also worked on an NSF sponsored research project at Northwestern on bringing computational thinking into STEM classrooms (http://ct-stem.northwestern.edu/) from 2011 to 2015.

EarSketch

Sounds | Scripts | API

Preview Tempo: ⊕ 110 ⊖ (BPM)

ELECTRONIC | DRUMS | YOUNG GURU
HIP HOP | BEATS | RICHARD DEV
JAZZ | PERCUSSIONS | MAKEBEAT
COUNTRY | GUITAR
WORLD | PIANO

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EFFECTS

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0

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untitled.py x +

```python
1  from earsketch import *
2  init()
3  setTempo(120)# variables
4  introScratch = HOUSE_MAIN_BEAT_001
5  introWhoosh = TECHNO_WHITENOISESFX_006
6  introDrumfill = ELECTRO_DRUM_MAIN_BEAT_003
7  drums1 = TECHNO_KICKROLL_001
8  lead = ELECTRO_ANALOGUE_LEAD_013
```

EarSketch Beta V 2.56
Running script ...
Done ...
Loading File TECHNO_KICKROLL_001 done ...
Loading File TECHNO_SNAREROLL_001 done ...

Key Features

Learn Python and JavaScript	**Create & Share Music**	**No Prior Experience Required**
Learn one of the most popular programming languages in the world.	Create music in popular styles like dubstep and hip hop and share the songs with your friends	You don't need to know anything about music or coding to get started.
Remix sounds	**Free**	**No software downloads**
Create your own music from a library of sounds by Young Guru (Jay Z's audio engineer) and Richard Devine, or record or upload your own sounds.	EarSketch is completely free to use.	EarSketch is web-based. There is nothing to download or install.