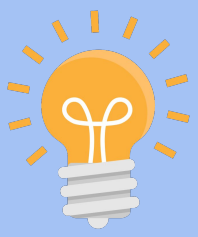
BACK to cover



# Unit 5: Programming in EarSketch

5.0 Marking Period Reflection:

This marking period, I did well in with assignments and participation. I always participated in class and I worked diligently to finish my assignments. When done, I never said no to being a mentor. The learning strategy that worked best for me was hands-on. Being able to put into practice what I learn helps me retain the content better. Obstacles I faced were having to match my pace with my groups. There were sometimes in group work when me and my partner weren't at the same place in our ProjectStem so they couldn't do the required work. Habits I want to improve in the next marking period is procrastination. During last marking period, I would often put work to the side because I would tell myself that I could get it done quickly at any time. However, things would come up and I wouldn't have the time to complete the work. I feel like my current grade could've been better as I lost most of my points with my notebooks and tests. I lost points in my tests because I wouldn't take my time and instead rush through them. When I realized how notebooks were graded, I understood why I got the grade that I did. I feel my current note-taking and study methods are effective for me because they meet my needs for retaining information. Thinking of the notebook as more of a journal would help my notebook fit the rubic. My three goals for this marking period are to stop procrastinating, regard my digital notebook as a journal, and utilize my time properly to get work done. So when I have extra time, I'll allocate it to working on anything in Web Development. That way I can ensure my work is getting done. This marking period served as an introductory period for me. It taught me the conditions and requirements of this class to keep up while maintaining a great score. It created my habits that would serve for the school year.

# Portfolio Peer Feedback Action Plan

## Kennedy Portfolio | Junior

NABILA RAISA

The layout is actually insane!! This is great, I love how the content pop up as you scroll. It's clean and neat, the colors looks professional. I would suggest that you add the project stem page that you have the navigation button for. The professional skills percentages of where you are at it is a creative move, and it looks really good!

Towaf Hossain

I like the animations and transitions you included in the webpage. The webpage is very professional and clear. To improve, you should fix the spacing in the CFU page heading. You should also add content to the Assignments and Notebook.

AARYA HAQUE

Your portfolio is absolutely amazing so far everything was structure and organized so well. It made learning about you more interactive. You made the portfolio personalized to you and not just information.

Vashti Dalchand

I love it, very professional. I like the hover over, I love the transitions and animations.

NATALY PARACHE

I love the transitions and i love how it looks so professional and i like the animations.

From the feedback, I got that my design was very nice but I focused on the design too much. Most of my feedback said that I was missing content in my pages. The navbar contained multiple pages but when a user would click on them, the page would be empty or not attached. There was also a spacing issue in one of my page headings. To meet these problems, I will allocate time on November 13 to add the missing content to my pages like CFUs and Labs. On the 14th, I will add my Notebooks and add finishing touches to everything there.

Goals:

- Add codeskulptor embedded iframes to CFU pages
- Add notebooks as PDF files
- Fix up any design aspects

Steps:

✅ Copy and paste CFUs into CodeSkulptor and save links in a document
✅ In portfolio on Github, add links to needed pages using iframes
✅ Download PDFs separately for each unit Notebook; use iframes to embed on Notebooks page in portfolio
✅ After this, look through GitHub directory to find any underlying errors

# Unit 5 Vocab & Links

⬅ BACK to divider

Unit 5 useful resources and links

How to access tutorials in Earsketch

Earsketch Curriculum

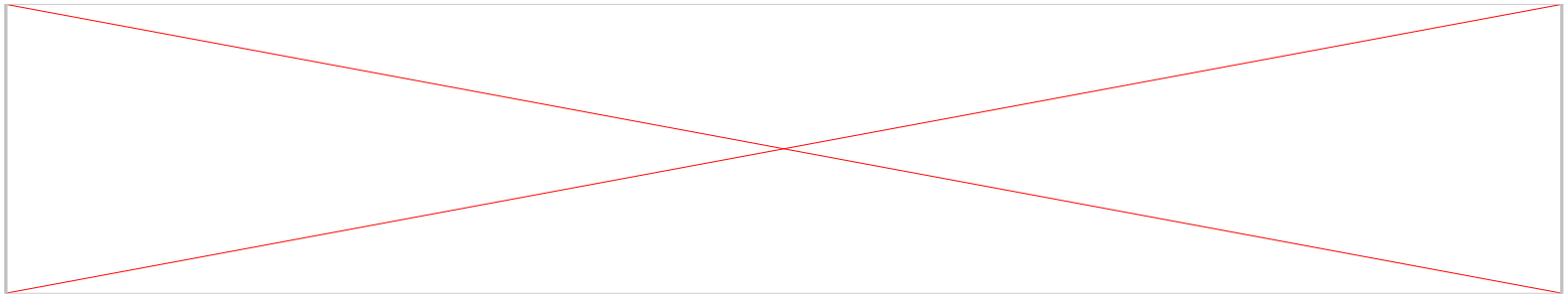
Vocab:

- Accent → An emphasis or “punch” at the beginning of a musical sound.
- Bar/Measure → A bar (or measure) is an amount of time containing a specific number of beats.
- Beat → A regular pattern within a bar or measure.
- Chord → When two or more notes or pitches are sounded simultaneously a chord is created.
- Composer → A person who writes music, especially as a professional occupation.
- Composition → A work of music, literature, or art.
- Conductor → The leader of a musical ensemble.
- Dynamics → How loudly or softly to play a piece of music.
- Ensemble → A group of people who sing or play music together.
- Form → The shape or organization of a musical composition.
- Genre → A category of artistic composition.
- Harmony → The simultaneous combination of pitches, especially when blended into chords that are pleasing to the ear.
- Instrumentation → The way in which a composer or arranger takes musical sounds and assigns them to specific instruments.
- Key → A group of pitches based on a particular tonic, and comprising a scale, regarded as forming the tonal basis of a piece or section of music.
- Major/Minor → The two types of keys, each with its own set of rules. Major keys offer an upbeat tone, while minor keys offer a gloomier sound.
- Measure → A measurement of time in music that contains a specific number of pulses defined by a time signature, and that is contained within bar lines.
- Melody → An identifiable succession of musical sounds.
- Music → Organized sounds based on musical elements.
- Music Notation → Music in written form.
- Musician → A person who writes, sings or plays music. That includes you!
- Pitch → The highness or lowness of a musical tone.
- Rhythm → A pattern of long and short sounds in music.
- Scale → An ordered group of pitches, arranged in a sequence stepping from one pitch to the next: for example, the major or minor scales.
- Sound → Vibrations that travel through the air and can be heard.
- Tempo → The speed or pace of a sound or piece of music. It is measured in BPM (beats per minute).
- Timbre → The perceived quality of a sound or musical note. Also known as tone color or tone quality.

# 5.1 - 5.4 Earsketch

to divider

GUI - graphical user interface
Digital Audio Workstation (DAW) - specialized computer software for recording, editing, and playing digital audio files
Application Programming Interface - API (a collection of tools provided by software)
Comments are done with #
Rhythm - the arrangement of sounds as music flows through time
* The tempo of a song affects the length of a beat, the basic unit of musical time.
Divisions of a beat are called sub-beats. Beats are grouped into measures.
Constants are in all uppercase
In EarSketch, measures always have four beats.
Common errors are misspelling, case sensitivity parentheses, initializing variables, script setup, and comments.



*The video shows how to set up Earsketch
The three main types of errors are syntax errors, runtime errors, and logic errors.
Syntax - code doesn't run at all
Runtime - The program stops due to an error midway through code execution
Logic - The program runs, but the output is unexpected

Earsketch->
Open Line → From earsketch import * (means import all from file)
setTempo(#) -> speed of music
variable = sound
fitMedia(variable sound, track number, start measure, end measure)
finish()

setEffect() uses 4 arguments
- Track Number: The track the effect is added to.
- Effect Name: The specific effect being used.
- Effect Parameter: The parameter, or setting, for the effect.
- Effect Value: The value of the parameter: a number in a specific range.

# 5.5 - 5.6 Earsketch

to divider

Envelopes

- A way to add effects to smaller portions of a track and define how an effect's parameters change over time
- can be used with any effect parameter
- (-60, 1, -10, 5) means a point is placed at measure 1 at value -60, and another at measure 5 with value -10
    - You'll see a line resembling a ramp between the points representing a smooth transition
- Arguments for Effects with Envelopes: trackNumber, effectName, effectParameter (optional), effectStartValue (optional), effectStartLocation (optional), effectEndValue (optional), effectEndLocation (optional)
    - The last five parameters are optional parameters so if left unspecified, they are set to the default value.

More Effects:

- Fades can be used to start and end a piece, or even to transition between tracks
- Mixing is the process of balancing multiple audio tracks to sound cohesive when played together
- Filtering is the process of removing certain components of a sound
- Reverb is an effect in which a sound persists after it is initially played

Tempo is the speed at which a piece of music is played, specified in beats per minute (bpm). Often different genres adhere to a particular tempo range as shown:

- Hip Hop 85–95 BPM
- Latin 95–105 BPM
- Techno 120–125 BPM
- Pop/Top 40 115–130 BPM
- Electronic 120-130 BPM
- Dubstep 130-140 BPM
- Drum and Bass 170-180 BPM

Pitch is a quality of sound that determines how high or low it sounds.
Scale - set of musical notes
Key - indicates the scale, or group of pitches, in which the music is composed
Transitions - passages of music that combine neighboring musical sections
* Major keys tend to sound pleasant, while minor keys sound darker, although this is not always the case.

# 5.7 Earsketch

to divider

Intellectual Property - ownership of things you create
Copyright - the part of law that covers ownership of creative work

- It keeps people from using your work in ways you would not want, like selling it without your permission.
- It lets you know when and how you can use other people's work when creating your own music, like remixing and sampling.

In the United States, having a copyright gives you six exclusive rights over what you create:

1. to make copies
2. to make derivative works - making a new work based on the original, like a movie adaption of a book or a remix of a song
3. to distribute copies - give them to your friends or sell them (if it's not under a label)
4. to perform publicly - dramatic readings, plays, and songs
5. to display publicly - especially for visual works
6. to digitally transmit - the rights to stream a song or movie

Copyright infringement - when someone violates any of the above with your work, unless it is covered by some exception
*Two copyrights exist in music: the rights to a song itself, and the rights to a sound recording. A pop artist who does a cover of a song from the Eighties would have rights to their sound recording, while the original artist would have copyright to their original song.
Sampling - the act of taking part of a sound recording and using it in a new piece of music
Fair use - the part of law that acts as a "safety net" to keep copyright from going too far
Fair use is decided on a case-by-case basis by a judge through four factors:

- The purpose and character of the use
- The nature of the copyrighted work
- Amount used
- Market harm

To license is to give permission
Creative Commons licenses - let creators specify what rights they keep and what rights they give away
Here are the possible parts of a CC license:

- "You can use this work however you like, EXCEPT..."
  - "...you have to put my name on it." - Attribution (BY)
  - "...you can not change it at all." - No Derivatives (ND)
  - "...you can not make money from it." - Non-Commercial (NC)
  - "...you have to share whatever new thing you make under the same license." - Share-Alike (SA)

# 5.8 - 5.10 Earsketch

BACK to divider

- Evaluation - assessment, is a judgment about the quality or value of something
- Objective assessment - only considers the facts, something that can be measured
- Subjective assessment - focuses on an individual's personal perception or feeling
- Correctness defines criteria for code that is free of bugs and performs its intended task. Evaluating correctness is objective.
- Complete code accomplishes all of the objectives set by the programmer, assignment, or project. Evaluating completeness of code is a subjective process.

Section - several measures that express an idea or feeling
Form - variety and structure
The most common form is A-B-A. The B section adds variety, while returning to the A section invokes familiarity. The code below creates an ABA form:
Section A: measures 1-4.
Section B: measures 5-8. Features contrasting sounds to Section A.
Section A (repeated): measures 9-12.
Custom functions allow you to write your own functions and avoid repetitive code:
Example:

```
# Setup
from earsketch import *
setTempo(100)

# Music

# Defining our new function with two parameters
def myFunction(startMeasure, endMeasure):
    fitMedia(ELECTRO_DRUM_MAIN_BEAT_003, 1, startMeasure, endMeasure)
    fitMedia(ELECTRO_ANALOGUE_PHASERBASS_003, 2, startMeasure, endMeasure)

# Calling our function, passing it two arguments: 1 and 17.
myFunction(1, 17)
```

Abstraction - a bundling of ideas to form a single concept
A process is a task running on a computer. Processing is carried out by a computer's CPU, which is responsible for executing program instructions.
Memory (a.k.a RAM or primary storage) holds data and processing instructions temporarily for the CPU to use.
Secondary storage refers to long term storage of data, often in high volumes. Data from secondary storage must be put into memory before the CPU can access it.
A computer communicates with the external world with I/O, a term for collectively referring to input and output.

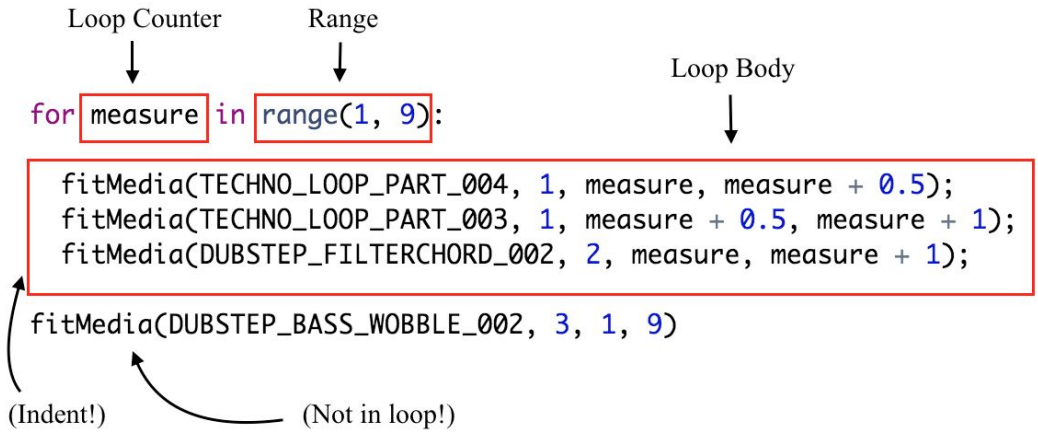
# 5.11 - 5.14 Earsketch

to divider

String - a data type that consists of a series of characters encapsulated by single or double quotes
Strings are used with the makeBeat() function to create rhythmic patterns in EarSketch. makeBeat() takes a beat string to define each sixteenth note sub-beat of its pattern. A 0 starts playing a clip, a + extends the note for the next sub-beat, and - creates a rest. makeBeat() takes four arguments:

- clipName: The clip a beat is constructed from.
- trackNumber: The track on which music is placed.
- measureNumber: The starting measure of the beat. The beat string determines the total length.
- beatString: A string that specifies the rhythm created.

A for-loop instructs the computer to execute a code section repeatedly, creating more efficient code. For-loops consist of a loop body, loop counter, and range. The code in the loop body must be indented.
The interpreter reads and executes a script in a particular order, which is called control flow.
The repetition of the loop body, or its repeated execution, is called an iteration.




Concatenation is a means to link strings together, effectively forming a new string. Substrings are partial strings sliced out of a larger string. The syntax for Python's slice notation is myString[startIndex, endIndex].
An index refers to a character's position within a string. Python indices start at 0.
Repetition - repeated sounds or sequences of music
Contrast - the differences in neighboring sections of music
Anacrusis - a series of notes that lead into the first beat of a melody
insertMediaSection() allows partial segments of a sound clip to be inserted into the DAW. It take five arguments: fileName: The sound clip that is used; trackNumber: The track on which music is placed; measureNumber: The starting measure of the clip; startLocation: Starting location within the clip; endLocation: Ending location within the clip