Assignment 1: Music Storage Format

In the first lecture, we briefly introduced the technologies that changed the music industry, such as phonograph, vinyl, radio, tapes, MTV, compact discs, and digital computers.

Please choose one of these technological inventions, based on the readings and media content this week and incorporating your own research, **state its working principles, histories, and impacts on the music industry in your own words**. Minimum 400 words.

Assignment 2: Vinyl vs. Digital

Many people argue that vinyl has better sound quality than digital media such as MP3 and computer speakers. From a scientific perspective, we know that human hearing is bandlimited (20Hz - 20000Hz) thus digital sampling theoretically doesn't change our perception of sound. Why do you think this argument was brought up? Why do many people who used to listen to vinyl records have criticism towards digital players or digital music? What makes them believe that vinyl is better engineered and has better sound qualities? Have you ever listened to vinyl records, if so, what's your perceptive difference between vinyl music and music played through your phone or computer?

Please reflect on the questions above. Do some research, combine your own experience, and write a short statement addressing these questions. Minimum 400 words.

Assignment 3: Streaming Music

Watch the video below and answer the questions:

1. What influence have streaming services exerted on the music industry?
2. How the calculation of streaming revenue might affect the creative process (i.e. songwriting) of music artists, thus changing the music we listen to?
3. How streaming music might change people's listening habits and aesthetics? Do you think our listening, perception, and tastes are adaptive? If so, how long do you predict it will take to tame our ears?
4. How do you evaluate these changes music streaming brought? Do you think they are good or bad, acceptable or unacceptable? What actions people should take accordingly to facilitate or prevent these changes?

Grade breakdown:

- (12 points) Please address all the points above in your response. Minimum 400 words in total.
- (3 points) Read your classmates' responses and make at least one reply. Your reply should be substantial and contribute to the conversation, which helps you both to attain a better understanding of the topics. At least 3-4 sentences.

Assignment 4: Audacity

Download the free, open-source audio software Audacity and experiment with its various functions as illustrated in Lectures 6-8. Here are two helpful resources: Sampling Theorem.; Understanding Aliasing.

Submit a write-up summarizing what you did and what effects you observed. Make sure to cover the following points:

1. Create tracks with different sampling rates and compare the sound quality of the same tone sampled under different sampling rates (Sampling Theorem).
2. Observe aliasing using a generated pure sine tone.
3. Produce a beating pattern by mixing two tracks of sine waves.

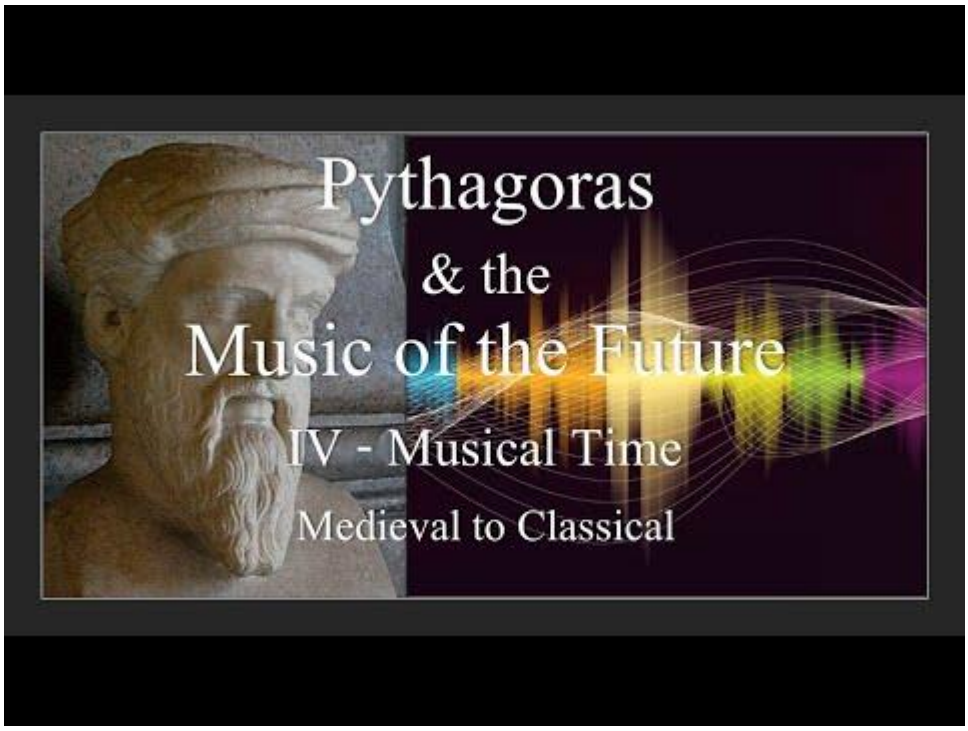
4. Compare the generated square waves with and without aliases. What are their auditory differences and why?
5. Record a piece of audio and experiment with various built-in effects in Audacity (the "Effect" menu).

Mandatory submission: a write-up summarizing your experimentation at a minimum of 400 words, with a screenshot of your Audacity interface showcasing your work.

Supplementary materials (optional): Audacity project files; exported audio files; anything you'd like to provide.

Assignment 5: Pitch-Rhythm Continuum

Watch the "pitch-rhythm continuum" part of the following video (1:44 - 5:18). Here is a blog illustrating the same idea.



Answer the following questions:

1. What is the pitch-rhythm continuum?
2. Have you ever thought about unifying pitch and rhythm?
3. How did the "pitch-rhythm continuum" statement challenge or change your perception of different musical entities such as pitch, rhythm, etc.?

4. The "pitch-rhythm continuum" theory is heuristic. What inspirations did you draw from it? What does it illuminate? Write down your thoughts.

Grade breakdown:

- (12 points) Please address all the points above in your response. Minimum 400 words in total.
- (3 points) Read your classmates' responses and make at least one reply. Your reply should be substantial and contribute to the conversation, which helps you both to attain a better understanding of the topics. At least 3-4 sentences.
- (Instructor bonus) Can you simulate the pitch-rhythm continuous phenomenon as illustrated at 5:00-5:17 in the video using some programming skills in your favorite software (Audacity, pure data, Max, MATLAB, Python, C++, Java, etc.)? Programming is not difficult, but it might be challenging how you design such a sound system. If you choose this bonus task, please don't post your results in this thread. Instead, please submit your work to the Instructor Channel so that the instructor can examine your results. Based on your algorithm performance, a bonus of 1-5 points will be awarded.