Final project submission answers.

2. List the modifications and extensions you made to the template file (400 words).
    a. New visualisations.
        i. New visualisations list:
            1. Ridgeplots.
            2. NoiseLines.
            3. Fireworks.
            4. Circle.
            5. Sandstorm.
        ii. Function:
            1. Provide new visualisations to the application.
        iii. Structure:
            1. All visualisation extends the Vis abstract class.
                a. This class has a public property name and a public method draw.
            2. Fireworks and Sandstorm visualisation:
                a. These visualisations follow a factory pattern, where a factory class is implemented that creates and depletes the particles drawn.
            3. The visualisations belong to the visuals array of the Visualisations class.
                a. This class serves as a controller of the visualisations.
    b. File Input.
        i. Function.
            1. Allow users to upload their own songs to interact with the application.
        ii. Structure.
            1. The feature extends the Control abstract class.
            2. It is declared as a global variable and included in the controls list of the ControlsAndInput class.
            3. It has public getters and setters functions in order to interact with other Controls in the application.
    c. Playlist Control.
        i. Function.
            1. Allow users to interact with predefined music of particular genres.
        ii. Structure.
            1. The feature extends the Control abstract class.
            2. It has a playlist array, which stores Playlist classes.

a. These classes have 2 properties, name and songs.

3. It has public getters and setters functions in order to interact with other Controls in the application.

d. BPM Control.

  i. Function.

   1. Allow the user to set on the fly a playback rate for the sound file, which makes the song slower or faster.

  ii. Structure.

   1. The feature extends the Control abstract class.
   2. The class has a GUI property that uses the p5.gui library.
      a. The GUI interacts with the global variable “bpmParams” to adjust the playback rate.
   3. Then, if the BPM control is being interacted with, the sound file rate changes according to the bpm params in the GUI.

e. MIDI keyboard.

  i. Function.

   1. Allow users to interact with a virtual keyboard. They can play different notes with an oscillator that goes from C4 to D5 notes.

  ii. Structure.

   1. The feature extends the Control abstract class.
   2. It has a property “osc” that represents a p5.TriOsc class, that starts with a 0 amplitude.
   3. It has a property “notes”, that represent a mapping of the keyboard numeric values, the MIDI note number for the oscillator and the actual music key.
      a. This mapping could be made thanks to the inspired acoustics table: LINK.
   4. The draw function creates a KeyBubble class, which is a drawing for the actual note that is being played mapped in the horizontal axis of the application.

f. Effects Pad.

  i. Function.

   1. Allow users to apply different sound effects to the playing sound file of the application.

  ii. Structure.

   1. The class has an “effects” property, which is an array of Effect classes.
   2. The Effect class is an implementation of the p5.Effect class of the p5 Sound library.

3. Describe how effective your plan was in completing your project (250 words).

a. The plan was executed with a 92% effectiveness.

- i. This was calculated by dividing the number of days I was on schedule (66 days) by the whole days of the Gantt Chart (71 days).

b. Division of work.
  - i. I decided to divide the project into 3 main categories:
    1. Enhancement.
       - a. This includes tasks that involve:
         - i. Code refactoring.
         - ii. Project planning and deliverables.
         - iii. Testing.
         - iv. Bug addressing.
    2. New features.
       - a. Include development tasks that were part of the interaction of the user with the application.
    3. New visualisations.
       - a. Include development tasks to implement new visualisations.
  - ii. For each of these categories, I divide the work into different tasks and subtasks (when needed).
    1. Each task involves a different branch in the GitHub repository.
    2. Whenever a task was completed the branch was merged with the main branch (master) and a new branch was created with the following task.
       - a. This allowed the separation of concerns of work, the possibility of revert if needed, and a good workflow.

c. Unexpected difficulties.
  - i. The implementation of the Effects Pad.
    1. I was expecting the behaviour of the Effect class of p5.Sound library, was the same for all the children in that class.
    2. This was not the case, and so, I could not implement other effects in the same way I implemented the Delay effect.
       - a. In the end, I decided to only implement the Delay effect in the final deliverable.

4. Evaluate the process of completing the project and how effective the final product is. (250 words).
   - a. Self-evaluation.
     - i. Stickness to the plan.
       1. I was effective to stick on the plan I made for the project.

            2. There were some unexpected difficulties, and in order to address them the plan needed to change, however, this was a change of no more than 5 days.
        ii. Extensions.
            1. The main focus of the project was to provide extensions for user interaction on the application.
            2. However, I believe that the visualisations and the design of the application were not a point of focus.
                a. The next time, I would make this different by:
                    i. Think longer on the visualisations, and provide more extensions of them.
                    ii. Apply more styling on the application, enhance the User Interface, and not only the User Experience.
                    iii. Use a CSS file to provide custom styles.
    b. User testing evaluations.
        i. I uncover some bugs and errors found in the user testing on the application.
            1. Several of these bugs were addressed for the final deliverable.
            2. A bug that could not be addressed, was the sudden change of playlists, which make the sound loop not end correctly.
        ii. The user responded well to the application, and they found it intuitive.
            1. This could be observed, since the users were explained the features at the beginning, and after some interactions, they could interact with the application by themselves.
        iii. User expectations.
            1. I've found that for the direction of the project, the users were expecting an application to mix songs.
                a. This was interesting since from the beginning that was an inspiration for the project, I could not implement that for the complexity of it.
                b. For a future version, I could come up with a feature that does this.
5. List any external sources that you have actively utilised in your project.
    a. For the project, I decided to keep any external libraries (except p5) outside of it.
    b. Some resources were used that helped me, including:
        i. Lessons from the course.
        ii. p5 library and documentation.
            1. LINK
        iii. p5 sound library.

iv. p5 GUI library.

   1. This library was extremely helpful in the implementation of BPM controls. It made the implementation very straightforward.
   2. The examples included in the GitHub repository of the library were also really helpful.
      a. LINK.

v. Inspired acoustics MIDI note numbers table.

   1. This table was helpful for the implementation of the MIDI keyboard.
   2. LINK.