

- **All elements should be resized when the window size changes**
- **Active Preset Buttons**
  - Each preset button should be red initially.
  - When you click on a preset button, it will turn green indicating that it is enabled
    - There should only be one green button at any time
    - The synth sounds should always be based on the preset that is green
    - If you click a green button again, it should turn red.
    - If there are no green buttons, the synth should be using the default configuration.
  - If a preset is mapped, using the settings/load button, and is not enabled, then the button will turn blue.
    - If the mapping is cleared for the preset, the color should turn back to red
      - The generate button should clear the mapping
    - If the preset is mapped using the settings window, the button text should remain as a number
    - If the preset is mapped using the load functionality, the button text should change to the file name
      - If a file-loaded configuration is modified in the settings window, the text should also turn back into a number or indicate in some way that the configuration was modified
      - For loading multiple different configuration files using the same load button, the button text for that preset should show the latest file name
      - Larger file names should not overflow the button
    - If the preset is saved using the save button, the preset button text should now reflect the new file name
      - For saving multiple different configurations using the same save button, the button text for that preset should show the latest saved file name
      - Larger file names should not overflow the button
- **Settings Window**
  - Should not allow MIDI and shouldn't interfere with the main synth keyboard
  - The base frequency should only accept integers or decimal numbers from 1 – 50000.
    - Should require a value
    - Any other characters should default the input back to a number.
  - The notes per octave should only accept integers from 12 – 24
    - Should require a value
    - Any other characters should default the input back to a number
  - The generate button should always clear the mapping and add the correct number of boxes to the window
    - The layout is subject to change but the frequency boxes should not overflow the screen at any size
    - The text in the frequency boxes should only go to 1 decimal place and display “...” if overflowed
    - The number of frequency boxes should only change with the generate button
  - The quick map input should only accept 3 integers separated by spaces
    - The first two numbers are the start and finish index for the frequency boxes you want to map, the third parameter is for how many boxes to skip to map the next note
      - Ex. “0 11 2” would map every other box from the 1<sup>st</sup> to the 12<sup>th</sup> box

- No partial or empty inputs allowed
  - No inputs outside of the range of notes per octave should be allowed
- The quick map button should always map the notes accurately based on what's in the input box
- When mapping a note, the color should first turn yellow and/or have a black border indicating that it's selected
- Once a colored note button (one of the rainbow buttons) is pressed, the box color should be the same as the note color with a line connecting them
  - Remapping frequencies should also change the colors accordingly
- No two frequencies can be mapped to the same key and no two notes can be mapped to the same frequency.
- The sounds generated by the keyboard at any point should reflect the current mapping.
  - If a note is not mapped, the keyboard should play the standard note at that position
  - Clearing the mapping should return the key sounds to the standard notes.
  - Menu bar at the top should always reflect the numbered preset selected
  - The "+" button should maximize the window and keep everything spaced correctly
    - Toggling it should return the window to it's previous size
  - The "x" button should always save the mapping before closing. So, opening the window again should show what was previously mapped.
- **Save/Load Buttons**
  - Save and load should only allow XML files
  - Save
    - The save button should open the file chooser window and start in "Documents"
    - There shouldn't be any limitations to the name or location of the XML file
    - Canceling or closing the window should return to the application window without errors
    - Saving without specifying a file name should not be allowed
  - Load
    - Any XML file can be loaded
    - Modified XML files with incorrect syntax should not be loaded
    - Loading a preset should populate the microtonal window accordingly
    - An XML file can only contain one preset
    - Canceling or closing the window should return to the application window without errors
    - Loading without specifying a file name should not be allowed
  - Example for configuration file syntax (index is note position from C to B):

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<Preset base_frequency="440" total_divisions="24">
```

```
  <frequency index="0" value="440" />
```

```
  <frequency index="1" value="466.164" />
```

```
  <frequency index="2" value="493.883" />
```

```
  <frequency index="3" value="523.251" />
```

```
  ...
```

```
  ...
```

```
  ...
```

```
</Preset>
```