Project Abstract: *Oscilloscope Guitar Hero*

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Guitar Hero is a classic rhythm game involving the coordination of button presses with some rhythmic pattern of notes. In this project, we intend to reproduce a simplified version of this game containing 4 distinct notes on an oscilloscope. The circuitry to accomplish this task will consist of a few components:

- Storing note patterns (4-bit songs) on an Arduino (Only digital component)
- Generating appropriate waveforms to display the game
- Detecting user input to determine if a note is hit (with some error)
- Mixing the audio of the notes hit

One major challenge to make the game more easily playable will be to ensure that the user input is given some margin of error from the precise point at which the note should be hit. To implement this project, we first plan to construct the circuit components that will generate the display for a single note on the ‘scope with a detection mechanism to see when the note should be hit. Then, we will add the necessary parts to read user input and generate a sound when a note is hit. Once these basic components are functioning, we will replicate the circuit 4 times. Finally, we will create the audio mixer that will combine the sounds of the four notes and play the song.