# Synth-esthesia
Intro to Embedded Systems→ Executive Summary

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Introduction

Synesthesia is a neurological phenomenon where different sensory pathways activate simultaneously. An example of this is when someone interprets numbers as colors, letters as colors or colors as musical tones. Musician Jimi Hendrix reported experiencing synesthesia symptoms when playing guitar. The main objective of this project is to translate colors into musical tones.
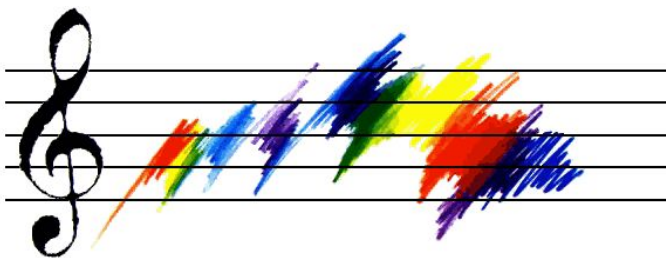
Theory of Operation

In order to interpret colors as audible tones, we must look at the nature of these two ingredients. Colors can be expressed as a wavelengths ranging from the smallest, red's wavelength, to the largest, violet's wavelength. Tones are represented by wavelengths as well. Since both can be represented by waves, we can translate color waves to specific audible pitch waves. A bit of musical theory is needed for the division of notes to colors. Since there are seven notes in a major scale, we need seven distinct colors. Luckily there are seven colors in the color palette; Red, orange, yellow, green, teal, blue, and violet. So the mapping is as follows; Red (1st note), Orange (2nd note), yellow (3rd note), green (4th note), teal (5th note), blue (6th note), violet (7th note).
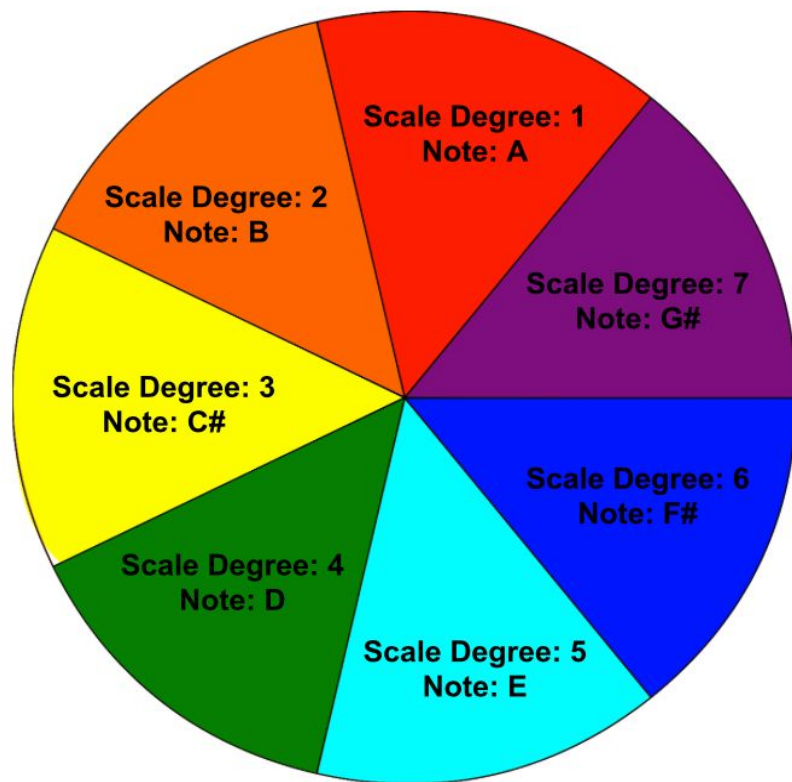
Synth-esthesia color to pitch conversion chart

General Description

The project requires the implementation of a color sensor, microcontroller, three buttons, LEDs and a speaker. The microcontroller will read the Red, Green, and Blue values from the color sensor. These values are then translated into a specific colors. Finally this color is then translated into a musical pitch. This pitch will be outputted through the speaker attached to the microcontroller. The objective is the ability to perceive color sequences as musical tone sequences. One will be able to hear their favorite painting and see what their favorite melodies look like.