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Distance Instrument

Overview

We propose to create an instrument that plays a certain pitch based on the distance of your hand from two ultrasonic sensors facing each other. This will also output an audible sine wave through an amplifier.

Peripherals

1. 2 Ultrasonic Sensors
2. Amplifier
3. Arbitrary Wave Generator

Software Design

Our project will be based on a while loop that waits for an interrupt from the ultrasonic sensors. We will then handle the interrupt by calculating the pitch based on the distance of the user's hand from each sensor. If the distance added from both sensors is distance D then it will play a single sine wave. If the distance from both sensors does not equal D then it will play two sine waves added together. There will be a spectrum of pitch from low to high depending on where the hand is with respect to the main sensor. If it is close then a high pitch will be outputted and if it is far then a low pitch will be outputted.

Goals

1. Create a song using hand movement
2. Output the song using an amplifier and arbitrary wave generator

Group Responsibilities

Jennifer – Connect amplifier and wave generator

Fernando – Logic concerning pitch calculation and program flow

Blake – Interfacing ultrasonic sensor with LPC 4088 board