Experiment 007 Buzzer

I Made This!

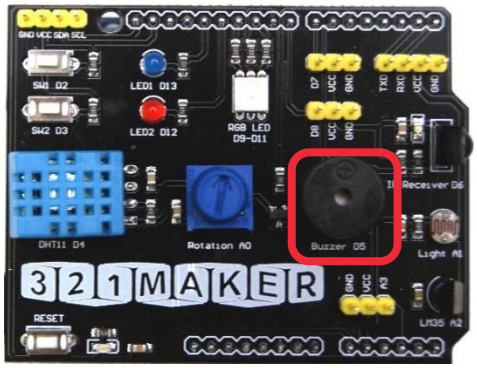
OVERVIEW

In this experiment you will control how the buzzer to play tones on the 321Maker Shield.

OUTCOMES

By the end of this experiment you will be able to:

- Apply the tone function to make a sound using a buzzer.
- Add a header file to a project.



REQUIREMENTS

- Arduino-Compatible board
- 321Maker Things Shield
- USB Cable
- Arduino Software

PREREQUISITES

- Getting Started Tutorial: http://321maker.com/start
- Source Code: https://git.io/vPZqS

VIDEO TUTORIAL

http://youtube.com/indevelopment

BACKGROUND

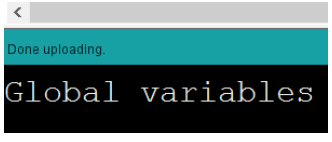
The tone() function generates a square wave of the specified frequency at a 50% duty cycle on a given pin. A duration can be specified as an optional argument, otherwise the wave continues until the noTone() function is called. The pin can be connected to a piezo buzzer or other speaker to play tones.

tone(pin, frequency, duration);

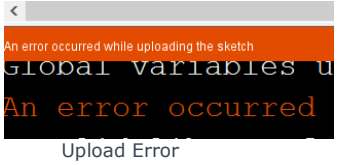
```
tone(6, 2000,100);   //Play a tone of 2000Hz for a duration of 100 milliseconds on pin D6.
```

LEVEL 1 PROCEDURE

- [ ] Connect your Arduino to your computer using the USB port. Open the Arduino software.
- [ ] Download the **Buzzer** program code from here: https://git.io/vPZqS
- [ ] Copy and paste the program code into the Arduino software editor.
- [ ] Make sure you have the correct Arduino Board and Communications port setup.
- [ ] Click the upload button in the upper left corner to compile and upload the code to the Arduino device. If you see an Orange error in the bottom of your screen, then something went wrong.



Upload successful



Upload Error

- [ ] Congratulations, when you push button one (SW1) the buzzer should play a tone.

Experiment 008 Buzzer

LEVEL 2 PROGRAM MODIFICATION

- [ ] Make the following modifications add this to line 9 of the code:
  #include "pitches.h";

- [ ] Remove line 20: ***tone(buzzerPin, 2000,50);***

  And replace it with the following:

```
tone(buzzerPin, NOTE_B4,408);
delay(408);
tone(buzzerPin, NOTE_A4,408);
delay(408);
tone(buzzerPin, NOTE_G4,408);
delay(408);
tone(buzzerPin, NOTE_A4,408);
delay(408);
tone(buzzerPin, NOTE_B4,408);
delay(408);
tone(buzzerPin, NOTE_B4,408);
delay(408);
tone(buzzerPin, NOTE_B4,408);
```

- [ ] Download the pitches.h library file located here. https://git.io/vPZqN
- [ ] From within the Arduino software click on the new tab button (below serial monitor) Or press the keyboard shortcut ctrl+Shift+n at the same time.
- [ ] Paste the code from the pitches.h library into this new tab.
- [ ] Click file, save and save this file as pitches.h

LEVEL 3 ADVANCED APPLICATION

- [ ] Create your own 15 second song that plays when the user presses the button using the pitches.h library.

LEVEL 4 PROJECT CHALLENEGE

- [ ] Modify the level 3 Advanced Application program to pulse the RGB light every time a note is played.
- [ ] Modify the previous project challenge to display a random color on the RGB led each time a note is played.
- [ ] Modify the previous challenge to map the different colors of the RGB to the different frequencies of the tones.
- [ ] What happens if you use the tone library on the RGB led pins? ***tone(9, 1,1000);***