CPE 301 1104 - Lab Report 8

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1   Abstract/Introduction

For this lab, we implemented the ISR macro function that we covered in the lecture. Moreover, we familiarized ourselves with using interrupts for the time overflow flag. Here, we made a piano-like keyboard program (as we have done in a previous lab) with a speaker and the ATmega2560 timer1 in Normal mode.

2   Experimental Design

Here, we created a program to receive a character from the serial port. This input character corresponded to a tone that would play on an external speaker.

We used an Arduino Atmega 2560 connected to a computer with the Arduino IDE. Altogether, we utilized a solderless breadboard, a speaker, and a 100 ohm resistor connected in series, and a jumper kit.

Our breadboard setup can be seen in Figure 1. The speaker was connected to the kit via Port B Bit 6 (Digital 12) and to ground. Basically, we would read in a character from the serial port (A, B, C, D, E, or F). When 'q' was pressed, PB6 would go low. PB6 was low to start with. Since 'q' (as instructed in the lab instructions) was lowercase, we used lowercase characters as the input for letters A-F as well.
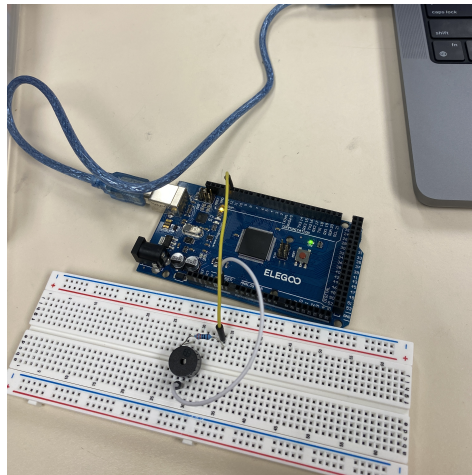

Figure 1:   The setup of the Arduino and breadboard (including the photoresistor)

3   Results

When a character was entered into the serial monitor, the speaker would play output a square clock signal to play the frequency of tone corresponding to that note in the provided toble. When 'q' was entered, the speaker would not output anything (PB6 was low). The speaker was silent to begin with.