

**New York City College of Technology**

**Electrical and Telecommunication Engineering Technology Department**

**Workshop:**

**Designing an keyboard Instrument using**

**Using the Arduino Microcontroller**

**Course:** EET 3120 Sensors and Instruments

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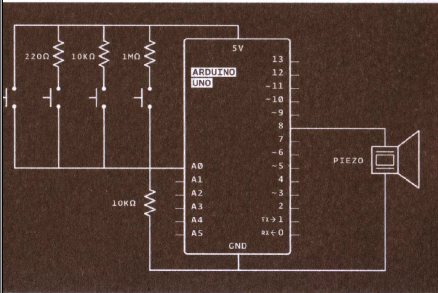
**INTRODUCTION**

This workshop that I attended is an introduction on how to use the Arduino Microcontroller to build circuit that behaves like a keyboard. There are going to be four push buttons that will when press will give off different sounds. For this to happen we have to program the microcontroller with a source code and build the circuit associated with this code.

**Components needed for the circuit**

1. Arduino /Chipkit UNO 32.
2. Breadboard.
3. Desktop computer.
4. MPEID or Arduino software
5. Jumpers (wire).
6. 2 – 10 KΩresistors
7. 1 – 220Ω resistors.
8. 1 – 1MΩ resistor.
9. 4- Switch.
10. Buzzer, Piezo

**Procedures**

1. First we build the circuit shown below on the breadboard.
2. Then we make the necessary connections using jumper wires to Arduino board.
3. We write the source code inside MPLabIDE software which will be uploaded on to the Arduino Microcontroller.
4. Connect the arduino microcontroller to a computer then upload the source code.
5. When you finish uploading the source code press the reset button then check if the circuits works by pressing the button.

**Source Code**

int buttons[6];

// set up an array with 6 integers

int buttons[0] = 2;

int notes[] = {262, 294, 330, 349};

//corresponds to the notes C, D, E and F

void setup() {

Serial.begin(9600);

}

void loop () {

int keyVal = analogRead(A0);

Serial.println(keyVal);

if (keyVal == 1023){

tone(8, notes[0]);

}

else if (keyVal >= 990 && keyVal <= 1010) {

tone(8, notes[1]);

}

else if(keyVal >= 505 && keyVal <= 515) {

tone(8, notes[2]);

}

else if(keyVal >= 5 && keyVal <= 10) {

tone(8, notes[3]);

}

else{

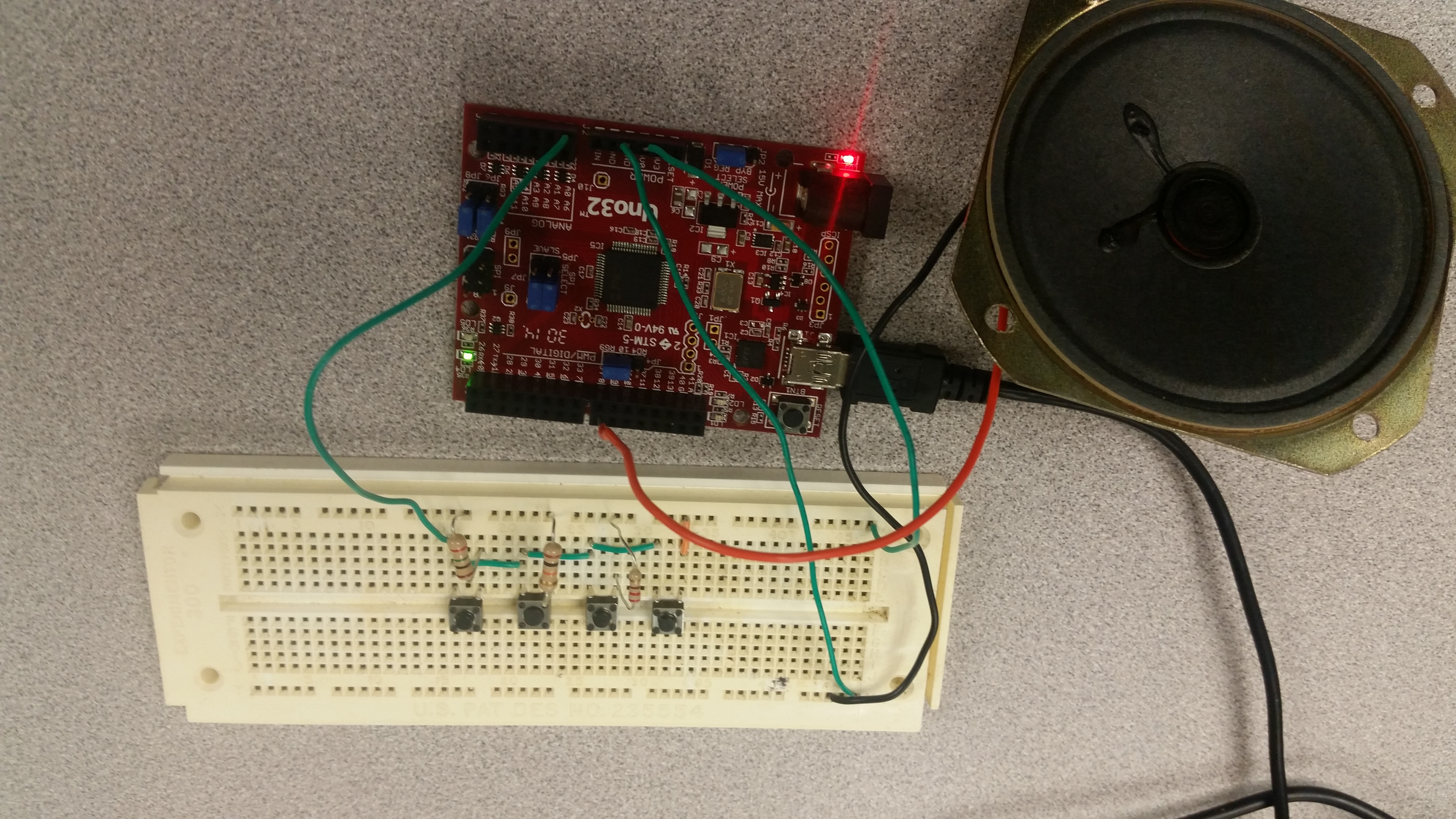
noTone(8);

}

}

**Result**

.



**Figure 2**; above shows the result of the Keyboard instrument

**CONCLUSION**

From this experiment we learned how to design a circuit that can produce different frequency. We used an arduino Microcontroller board to control the circuit and it function. There is a speaker that is part of the circuit which will emit the sound. In order for the microcontroller board to work a code must be written and uploaded to the board.