

Jingle Bell

By Samantha Cornejo



It might be the middle of the year, but it's never too early—or too late—to jingle some bells and embrace the Christmas spirit! Now, with your very own jingling ornaments and a personal light show, the holiday magic is always within reach!

Showcase / Description of Finished Piece



No, it's not just a solenoid and a bell taped together—it's the pride and joy of countless children across America. Ironically, I don't celebrate Christmas myself, but I still find a deep sense of nostalgia in the holiday season.

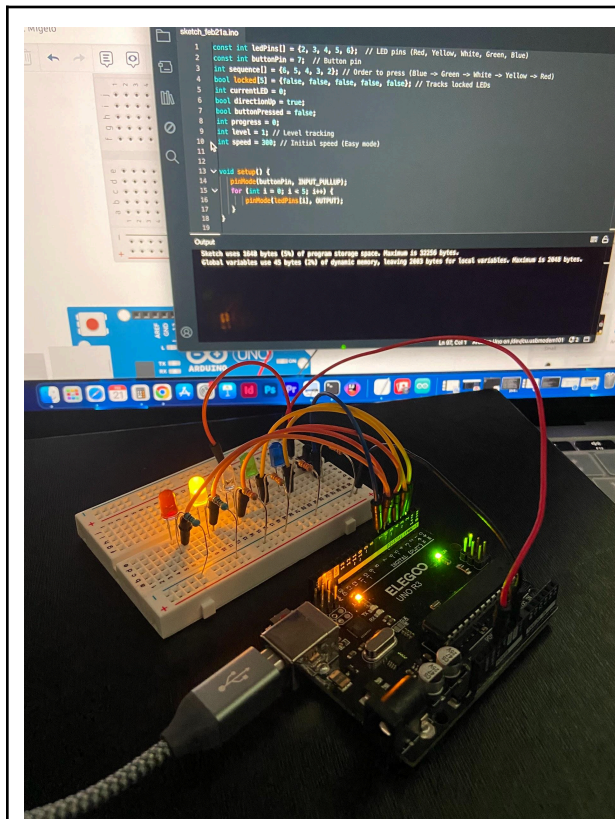
One of my favorite things about winter is the lights. There's just something about them—I always find myself drawn to them when

designing projects. That's why combining the cheerful sound of 'Jingle Bells' with a synchronized light show felt like the perfect way to capture the magic of the holidays. I think it would be amazing to see this idea brought to life in future ornaments—ones that not only light up but also fill the room with music.

This is the first piece that I have made that is not interactive, instead you just plug it in and enjoy the experience. I do not have a Christmas tree, but I do have a beautiful plant with vines capable of holding this concatenation. Enjoy the video :)

[The Incredible Experience](#)

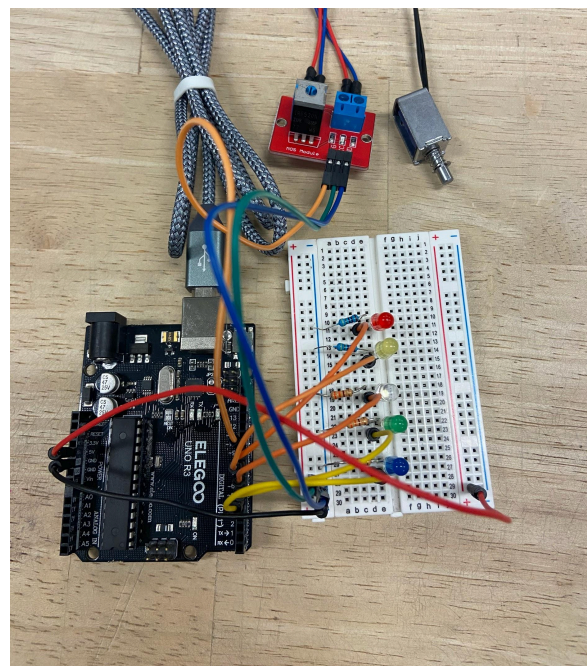
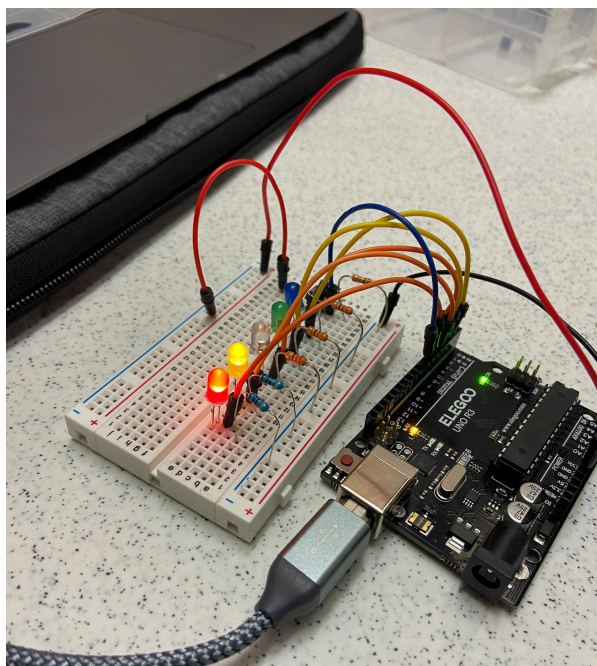
Process



Ideation/Design Process:

The first OG idea was inspired by my first project, an LED ladder game. I was thinking about creating a hot potato game where the solenoid would serve as a timer. I was going to have a button to indicate when users drop the 'potato' (or in this case, turn off the led), however, due to time constraints and the fact that I had midterms, I had to think quickly about how I could combine LED components with a solenoid.

That led me to Jingle Bells! I was listening to music when I realized that the solenoid could mimic the backtrack of a song through its clicking. I spent a while trying to figure out how to trigger a solenoid click to make a song, and once I did, I realized it would be difficult to mimic a soundtrack made by any of my favorite artists like Drake or Rihanna. So I looked for simple songs and there came Jingle Bells. It worked nicely in my head once I connected the ideas of using the LEDs to create a Christmas season light show.



Binary 0 and 1

0

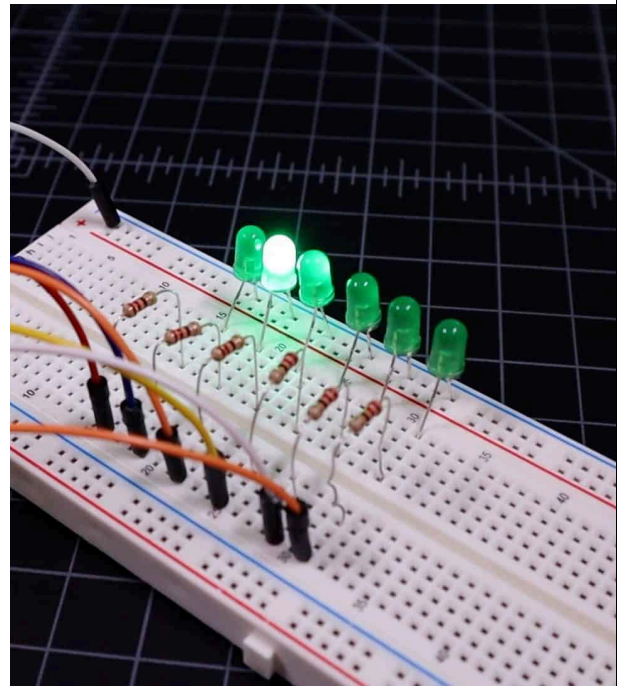


A binary 0 means OFF.
No current is flowing through
the light bulb, so it is off.

1



A binary 1 means ON.
Here, current flows through
the light bulb to turn it on.



Prototyping/Building Process:

I already had the wiring for the LEDs figured out, and with the help of the lecture slides, I was able to wire the solenoid without much trouble. The hardware setup went smoothly—most of the challenges came from the coding side.

I probably spent two hours just trying to get the solenoid to match the tempo of 'Jingle Bells.' It wasn't my proudest moment, but after a bit of frustration, I realized I could simplify the whole thing using a basic pattern of 1s and 0s—1 to trigger a click, and 0 for silence. Once that clicked, I had the solenoid playing the melody.

Then came the next challenge...syncing the LED light show. I went through several iterations trying to get the lights to blink in time with the music. While I did manage to align them to the tempo, it left no room for more cooler effects. I had hoped for randomized patterns to add some variety, but in the end, I had to settle for a constant light show. Still, everything came together nicely in the end.

Conclusion / Reflection

It can be nice to have a bit of a closing message. (You don't have to answer all of these questions. These are just some suggestions. Ultimately, you should write about whatever you feel is relevant to your piece and its goals, characteristics, message, etc.)

The goal of this piece was to create something fun and festive—a small “ornament” that could light up and chime to the tune of “Jingle Bells.” I saw it as a playful way to merge basic electronics with a bit of holiday cheer. In that sense, I feel pretty successful. The solenoid “sings” the melody, the LEDs shine bright, and even though I couldn’t get the randomized light effects I wanted, the piece still captures the spirit I set out to achieve. I learned a lot—especially how simple logic (like 1s and 0s) can do a lot more than it seems, and how sometimes simplicity is key in getting something to actually work.

The final result reminds me of my childhood, even though I don’t celebrate Christmas. There’s a certain universal feeling in the winter season that brings people together, and I think this piece taps into that. In terms of what’s next, I’d love to refine this concept further. Maybe create a set of ornaments, each with a different sound and light personality, or explore how to make it more interactive.

For future projects, I’ll definitely carry forward the lesson of prototyping in small steps, testing early, and embracing happy accidents. Shoutout to my bestie Chat, we definitely went back and forth a lot during this project but it brought us closer together.

Links

Code	<link>
Final video	<link>

Sources

If you used tutorials, Stack Overflow code, or other third-party materials, you should cite them here! It's good practice and this way you'll be able to find it again in the future :-)

If there are sections of your code that are from third-party sources, try to directly cite them in your code using a *//comment*, too.

Lecture Slides	<link>
My bestie	 ChatGPT