

ME 30 Project 2: Simple Game

Reflecting on Problems and Takeaways (anonymous)

What are some problems you encountered along the way of working on your game for Project 2, and what did you learn from them?

Problems or challenges you encountered	What you learned from dealing with that problem or challenge
I had issues getting the kb2040 to turn the motor on.	I learned that you need to make sure all the grounds are connected to each other. My 12v and kb2040 ground were connected and that caused the issue.
I attempted to use a potentiometer but found that the range of rpm it provided for the motor was not usable for my application	A beefier potentiometer may be required for my use case. I ended up splitting the circuit into a 12v and 3.3v line to achieve different RPMs.
I wanted to light up 24 LEDs around the edge of my wheel. I wired them all up by color then realized that 6 LEDs in series would not get enough voltage to light up with the 5v battery i was using.	I worked with Brandon and other TAs to create a bjt circuit that would power 3 LEDs. i learned that troubleshooting can be frustrating and that its important to take breaks and ask questions when ur confused.
My motor was spinning too fast for my game and I had issues slowing it down	I learned that you can slow a motor down by connecting it to a 3.3V regulator.
I had a lot of trouble with the spinning disk portion of my game, if it had even the tiniest bit of resistance, the disk would lose traction and the motor would continue spinning.	I made the cardboard stick more tightly around the motor, while also clearing up any and all loose edges. This made a slight gap between my game's circles, but with a larger marble, this wasn't an issue. Also in playing, I learned that if the disk isn't spinning at first, I can give it a manual little nudge and then it follows the motor spin.
I had trouble balancing my game and attaching my metal plate to my motor. If I physically bolted the plate and the motor	I created a motor hub that would hold magnets and used tape as support to hold the plate up. I learned the challenge of

hub together, it would interfere with the game.	attaching two parallel spinning plates.
I had trouble with wire management in my game. Trying to avoid getting alligator clips tangled by my motor and having jumper cables constantly come out of nodes on the breadboard was a pain	I learned that sometimes it may be more worth my time and effort to solder parts of my project onto a perfboard after testing, rather than breadboard every component
I wanted to make my motor turn on for just a short period of time with the press of the button and then have it slowly stop spinning. I could only get it to react to holding down the button instead.	The effect that I wanted was still somewhat achievable because by holding down the button and releasing, the motor didn't immediately stop. Next time I'll try to use a capacitor which could possibly create the desired effect.
I had issues making my motor stand up vertically to make sure all the pieces of my game were at the same "height"	I made sure to make the support friction fit so that the motor is able to be vertically flat without touching the ground.
I wanted to turn the motor in the opposite direction really fast.	Instead of making an h bridge circuit or using the kb2040, I figured out mechanically how to create a work around.
I had issues with my mosfet working even when it didn't have gate power	I remembered why the pulldown resistor exists
I had issues attaching my spinning disk to the motor and adjusting my design with the different tries it took.	
My motor would randomly not spin when I pressed the button.	I think the weight of the game was too much, and tilting the motor to generate momentum helped get it started spinning.
I had wiring issues. It seemed like a major component was broken, but it turns out one of my alligator clip wires was faulty.	It is good to use a multimeter to check all of your connections to make sure they are secure and working properly.
I couldn't figure out how to laser cut on my own.	I got help and learned how to laser cut.

I was having a hard time figuring out how to wire everything properly and overall troubleshooting	I used resources like class materials (from the website) and also asked the TAs
My circuit with the transistor wasn't working until multiple trials. I wanted my motor to go slower.	I learned/reviewed what needs to go on which sides of the MOSFET. I tried adding resistors, lowering the voltage, but ended up adding code with the KB2040.
I really tried to figure out how to incorporate the potentiometer into my circuit so that I could slow my motor down, but after many trials and configurations I wasn't able to figure it out. Another one of my goals was to figure out how to keep the motor running without having to hold a button down, which I achieved by using a capacitor.	By asking questions about how to do what I wanted my circuit to do, and troubleshooting many different configurations for my circuit board, I deepened my understanding of how certain fundamental circuit components work with each other and how I can make a circuit do what I would like it to do!
The motor kept running when it was attached to the BJT even when there wasn't power supplied	I learnt why the pull- down resistor was needed to make sure there wasn't any energy left in the capacitor of the BJT
Needed my motor to turn at a much slower rpm so I experimented with many different methods. Some worked, but heated up the circuit too much and eventually burned components... tried 5 or 6 different circuits.	Learned different options to slow the motor down and that it may be helpful to take a step back and calculate current draw through different components before testing them. Would avoid some broken components and singed fingers
Trouble with wiring management, four buttons needed a lot of alligator clips, and I couldn't troubleshoot my circuit easily	Drawing a diagram of the circuit really helped and color coding the alligator clips. Also if I had more time I would solder wires to the buttons to make it less spaghetti and more secure.
My motor spun too fast	I adapted the game to work with higher speeds.
I had a button inputting to the KB2040, but it was receiving voltage even when there was no wire connected	Have a resistor in parallel with the KB2040 input going into ground

10:30am Section

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