Culminating Assignment - RC Car

Instructions

1) Turn the switch on the battery box to on.
2) Check if the control components are blinking (Arduino UNO, L298N Motor Driver, HC-05)
3) Pull out a device and link it with the bluetooth chip
4) Open the created bluetooth application (RC_Car_Controller) and press the search button
5) Once found, button will display connected and car is ready to go
6) Use app buttons to control

Project Description

For the final project, I decided to create an RC car. It runs on four DC motors controlled by one L298N driver chip, with 2 motors connected to each side of the screw terminals. The driver receives information from the arduino, which receives its information from the HC-05 bluetooth chip. The chip is connected to my personal device (Can be any) and is used by an application I created in MIT App Inventor. The app has 4 arrow buttons, which each send a different value when they are held down that are read by the arduino code. When any of the buttons are released, another value is sent telling the arduino to stop the motors. The entire car runs on 8 AA 1.5V batteries and each motor consumes around 3-6V being sent through the driver chip, with top speeds of the motors reaching an estimated 10 full rotations per second. For future use, never install more than 12V as it will burn out the motors and if the car moves on its own even after releasing a button, check to make sure arduino wiring is secure (specifically the rx and tx pins).

Parts

- Wires
- 12V Battery Cartridge (With Switch)
- 4 DC Motors
- HC-05 (Bluetooth Chip)
- Arduino UNO
- L298N Motor Driver
- Plastic Car Frame
- Screws
- Bolts
- Copper Screw Rods
- Gorilla Tape
- 8 AA 1.5V Duracell batteries

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Issues/Problem	Attempted Solutions	Final Solution
Bluetooth chip not receiving inputs from app	-Resetting bluetooth chip -Changing app code -Sending different types of information	The bluetooth chip was actually wired incorrectly as the rx pin was supposed to go to the tx pin and vice versa. A quick wire swap fixed the problem and allowed to chip to begin receiving primitive data
Arduino and L298N Driver Chip were not powering on at the same time despite sharing a power source	-Switching out wires for new ones -Randomly wiring/un-wiring different screw terminals -Using a separate driver and arduino chip	The two chips must be sharing a ground for the 5V regulator in the driver chip to share its power to the arduino. I plugged two wires in the driver's ground outlet that stem from the ground of the power source and arduino, which powered the two chips on.
Arduino not reading information sent from Bluetooth chip	-Rewriting the arduino's receive code -Replugging in the rx and tx pins -Changing the information being sent from the arduino to a single character	For some odd reason (to which I still have yet to uncover), the arduino does not read the char values being sent from the app. When printed, the information looked perfectly fine, so instead of spending years trying to figure out how to fix this, I decided to change the variable that stores the information to a INT data type. The bluetooth chip now sends numbers as a string, which, when converted to an int, would produce a decimal value (for example 1=49 when converted). I then rewrote the if statements to fit the change and the code finally recognised the data, thus solving the issue.
Motors not powering on	-Using 9V battery -Testing all (and I mean all) points off error with multimeter -Wiring different power ports -Testing individual motors with 9V	When powered through the arduino power port, the car worked just fine, however, when I removed that source and connected a 6V battery cartridge, the motors would start stalling. This was solved by purchasing a 12V cartridge instead, allowing the motors to have ample power while also powering all the other components.

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Code not uploading	-Replugging upload wire -Unplugging some components -Testing arduino for damage	I looked up the problem online and found that, for some reason, the bluetooth chip inhibits the uploading of code to an arduino, so I just unplug its power before uploading
Not enough ports in the L298N Driver Chip	Final Solution was the first attempted solution	Very early on in the planning phase, I wanted to use two driver chips that control two motors each, however, as the project advanced, I realized I wouldn't have enough power ports to power all the components. I ended up tying both pairs of wires connecting the motors together and plugging them in their respective ports of the driver chip, which, to my surprise, worked on the first try.

Troubleshooting Log – Memory Game Development

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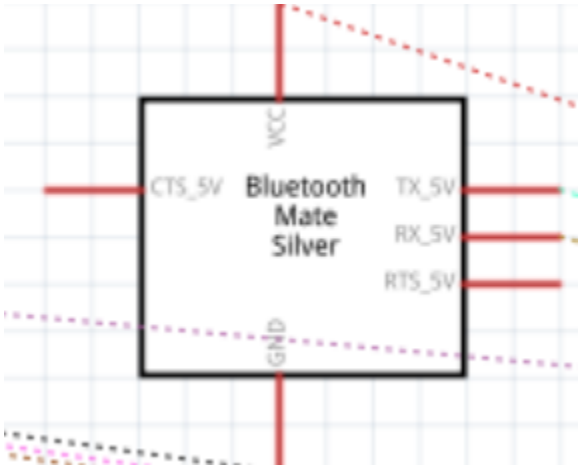
Arduino UNO	
Motor	
HC-05 Bluetooth Chip	

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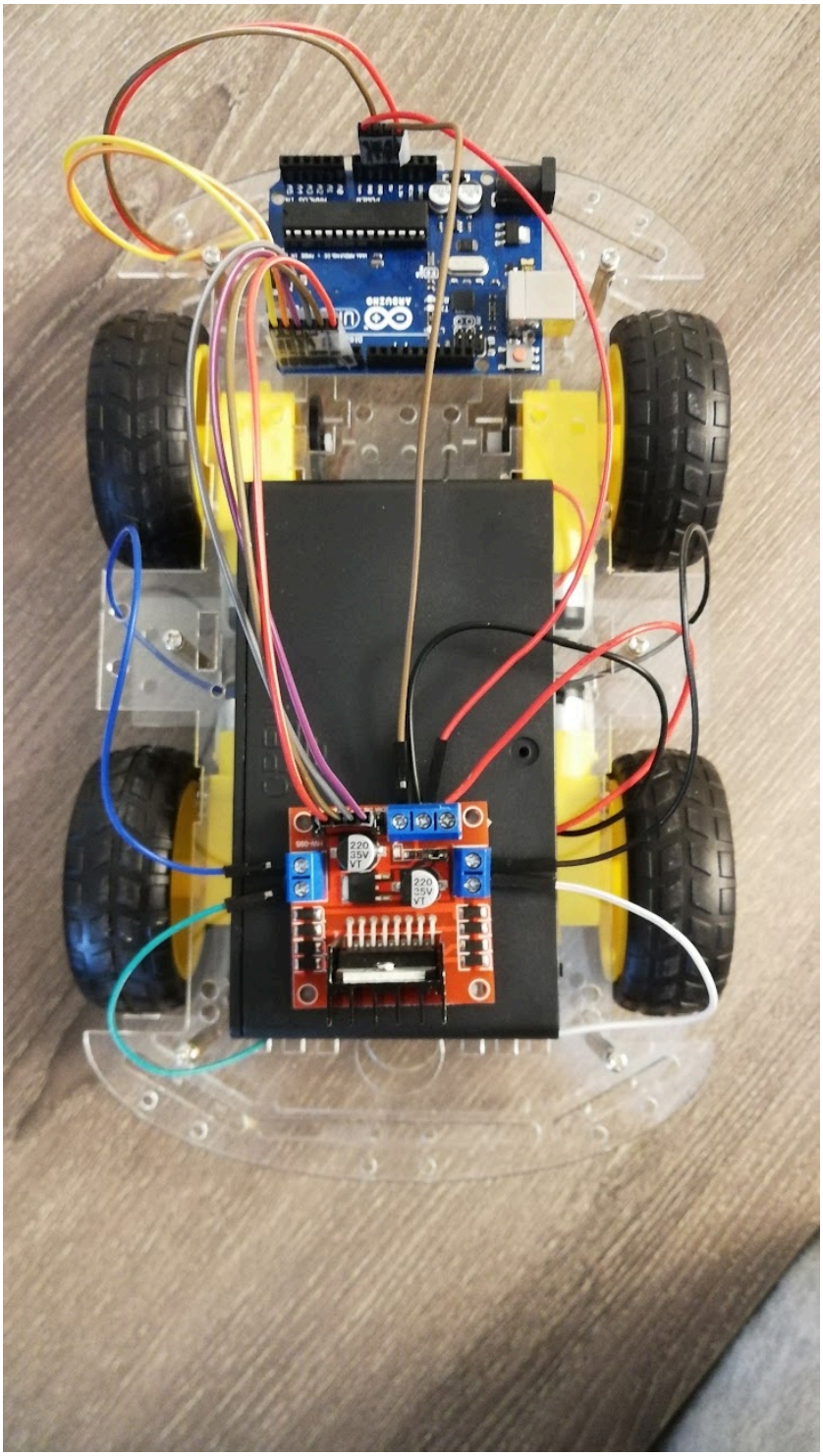

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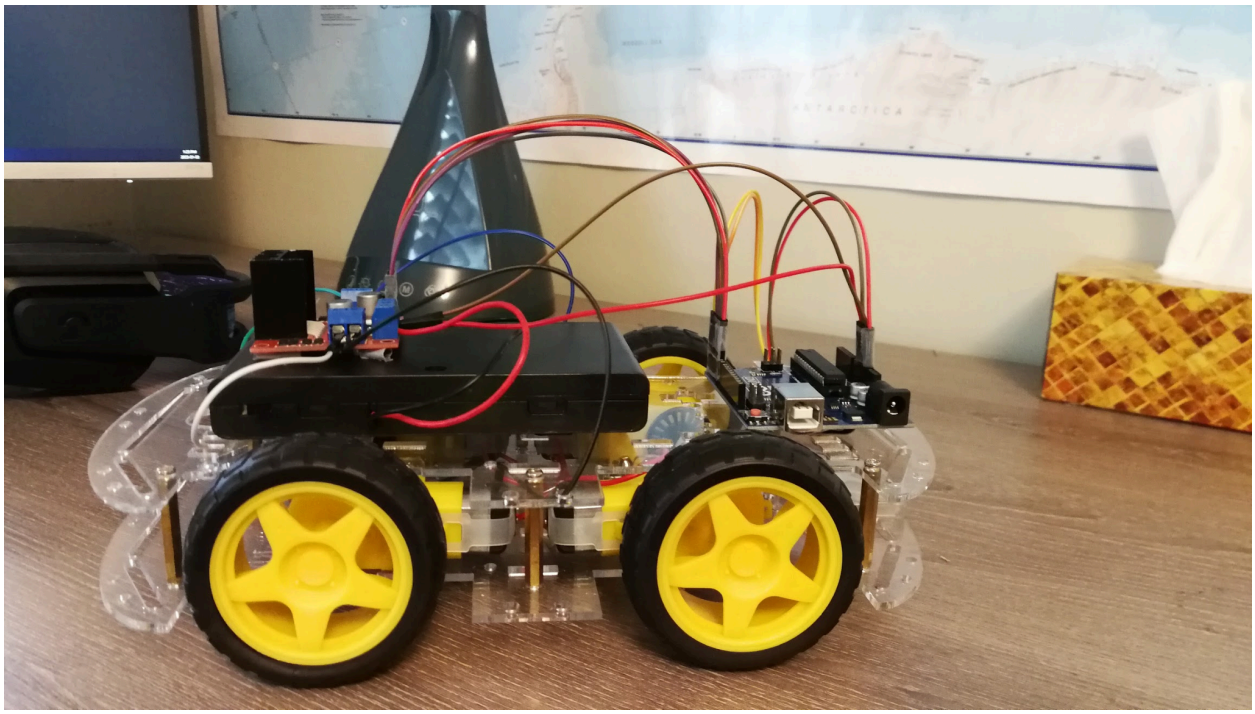

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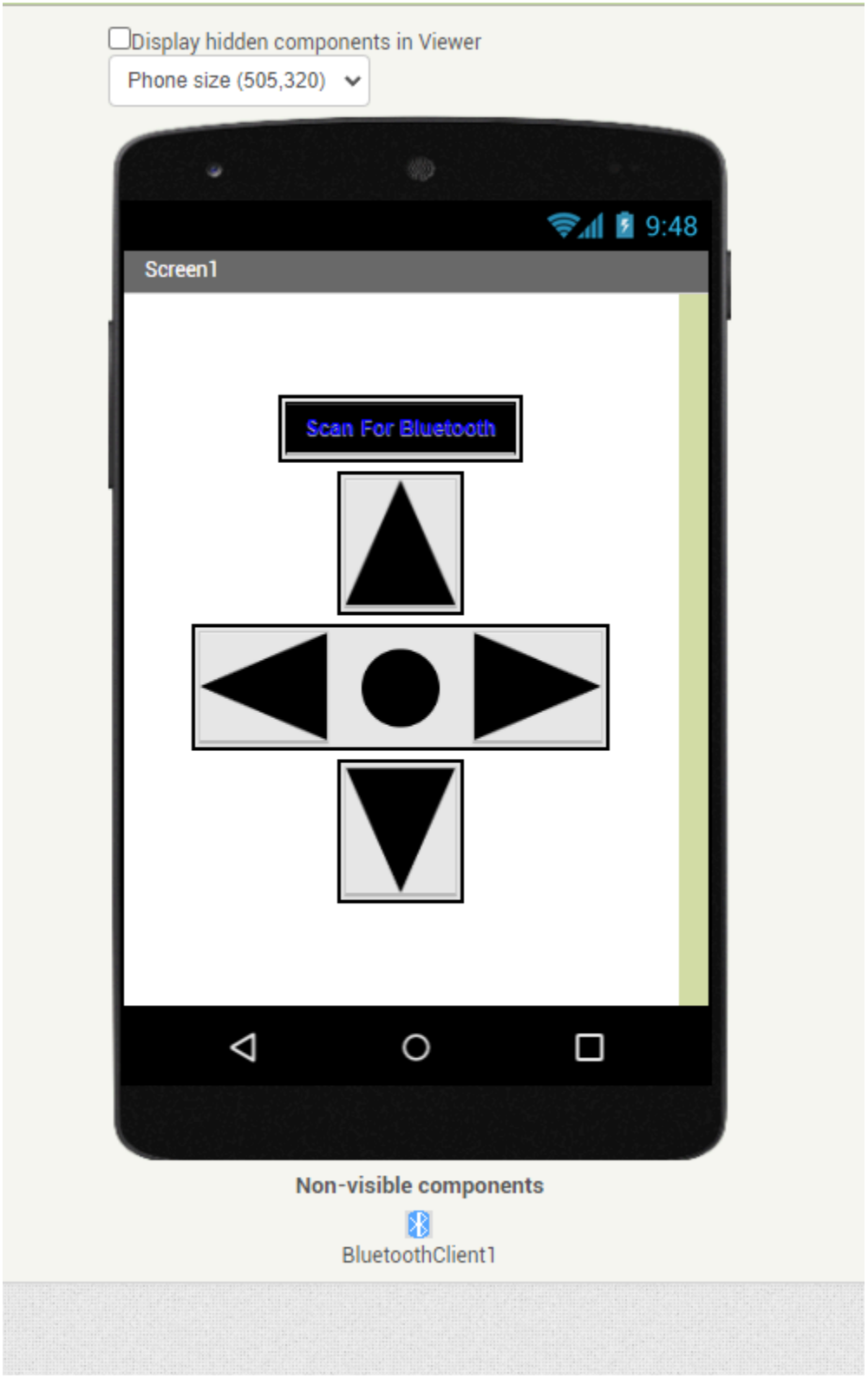
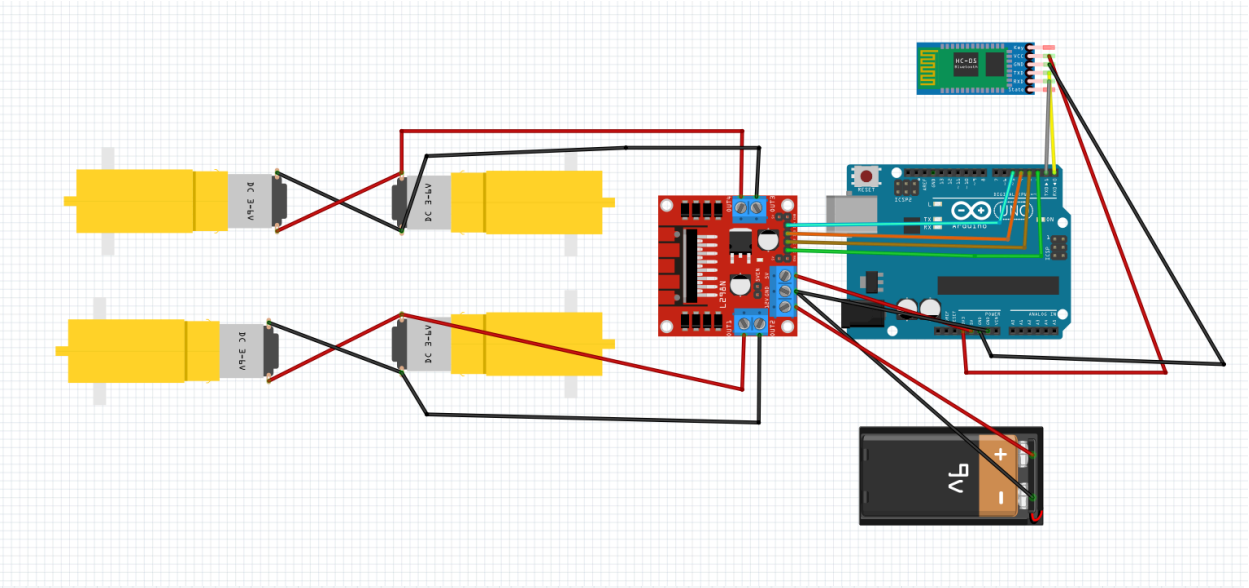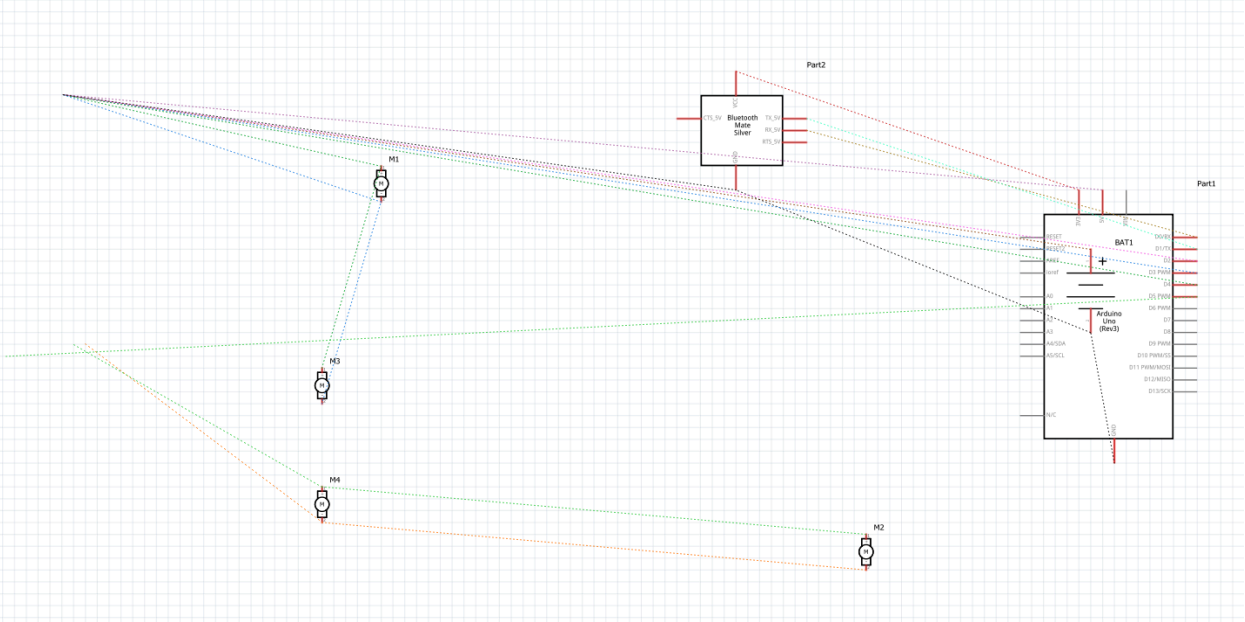
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