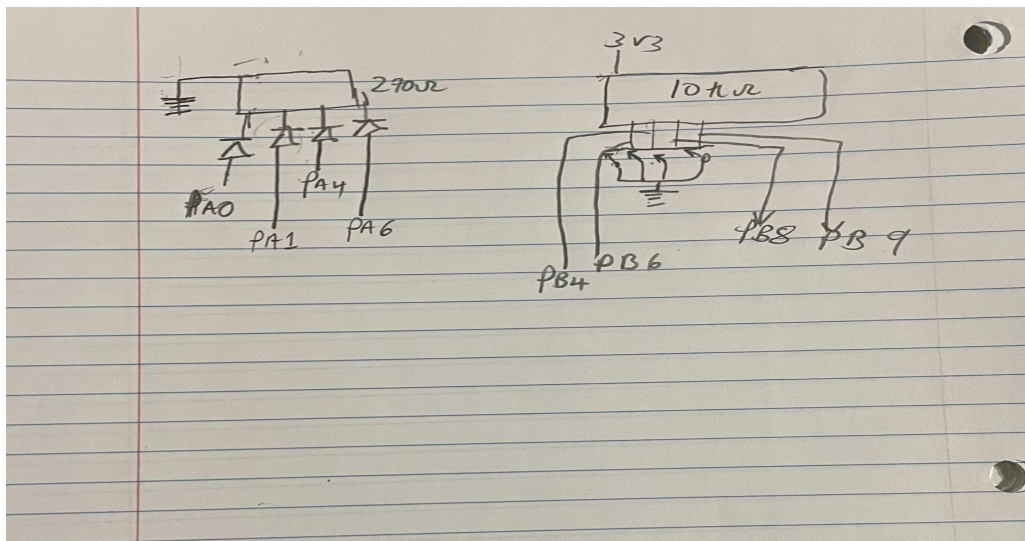
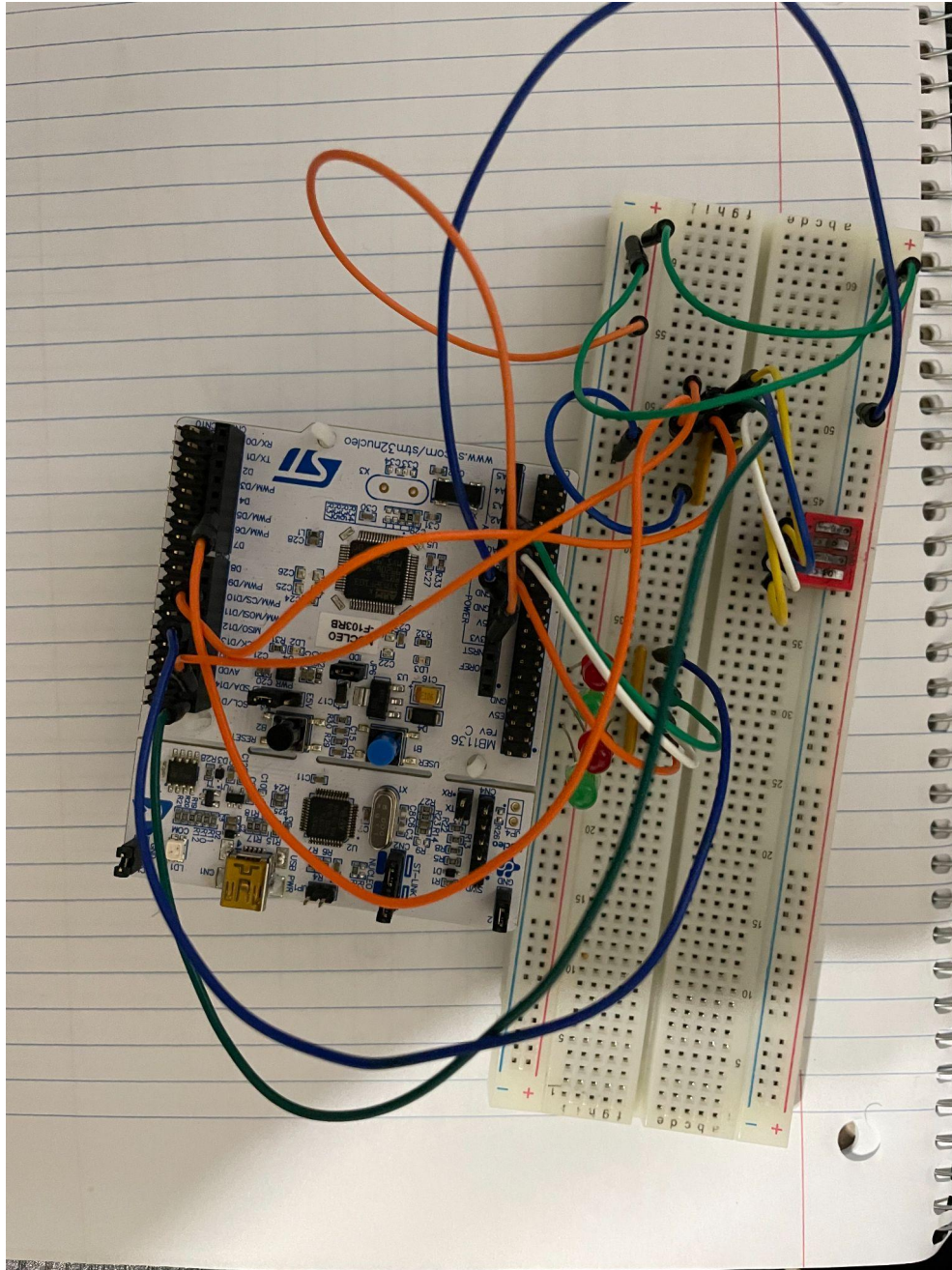


MUBARAK ABIOLA KESHIRO
200443413

BATTLESHPIS PROCESS EXPLANATION

The game battleships is a game where two players play against each other. Both players set up their ships, and my program configuration acts as one players' set up. Both players take turns calling out coordinates and my configuration shows if it's a hit or miss. After a couple of misses, the configuration shows if a ship has been sunk. When all ships have been sunk, my setup displays gameover. In my hardware configuration, I used the STM chip, 4 LEDs, 2 resistors and a 4 input DIP switch. My output ports were PA0, PA1, PA4, PA6 and input ports were PB4, PB6, PB8, PB9. I connected the 4 outputs to a 270k ohm resistor and to ground, I connected the 4 inputs to a 10k ohm resistor and to 3.3 volts. My schematic below shows the connection between my chip, the connection to the chip picture is included too.





HOW MY SYSTEM WORKS

The DIP switch takes the coordinates inputs in binary, in the order of row, then column. The row is read once the system is started and the blue button is pressed, then the light on the chip (PA5) comes on to signify the row has been read. Then when the blue button is pressed the second time, the column is read and the PA5 light blinks to signify the column has been read. At this time the coordinates are complete, then the first (green) LED on PA0 comes on if the coordinates missed all ships. The second (red) LED on PA1 comes on if the coordinates hit a ship, the third LED (green) on PA4 comes on if a ship has been sunk and the fourth LED on PA6 comes on if all ships have been sunk and the game is over.

TABLE SHOWING OUTPUTS

GAME MODE	LED color	Port	Order on circuit
Ship missed	Green	PA0	First
Ship hit	Red	PA1	Second
Ship sunk	Green	PA4	Third
Game over	Red	PA6	Fourth

PROBLEMS FACED

Although my system is fully functioning now, I had a massive problem that my circuit was only working when it was in debug mode on Keil, however when I downloaded it to my board, it ran so fast it was reading row and column at the same time and it made the game display miss all the time. However with the appropriate placement of my delay functions, it worked fully when I downloaded the code to the board. It was very frustrating as I was stuck on this for 3 days.