Skills and Experiences Gained

1. Arduino IDE Experience
This application required many library installations based on the components used first before being able to start writing the actual code for the air mouse. In this scenario, the ESP32 boards needed to be installed using a .json file, the correct model of the ESP32 used needs to be selected, and the designated COM port it is connected on.

2. KiCad Experience
This tool required knowledge on circuits and drafting since this is where the schematic and 3D visualization of the project is created. Since the ESP32 and MPU6050 are not basic components, they are not available in the symbols, footprints, and 3D models in KiCad unless installed. These components can be found on the internet or can be created manually. With the help of internet tutorials, I was able to simulate the actual visual of the air mouse model which was helpful in making that vision to reality.

3. Understanding on Microcontrollers and Sensors
The brain and senses of most electronic devices are the microcontroller and sensors. In this experience, I was able to intimately understand the ESP32 microcontroller and MPU6050 Gyroscope Sensor. ESP32 has many model varieties with different functions, each are able to be embedded with code via Arduino IDE to make them do things however I want them to. MPU6050 is a sensor that gathers input through the x, y, and z axis, which is ideal for making the air mouse.

4. Circuit Design
The circuit design required an insurmountable amount of considerations before it became functional after the etching process using sticker paper and ferric chloride. Some of the notable considerations were making sure circuit that the connections are correct as per the breadboard prototype, allowance in each pin for lead to stick during the soldering process, 45° angle if curves are needed since 90° angles can cause problems during the etching process, 90° angles first on each pin before curves to prevent possible short circuits on pins close to each other, and a designated Input Battery route to prevent possible short circuits.

5. Soldering and Desoldering
First-hand experience in soldering using solder flux, solder, and soldering lead is an essential skill learned in this project. Understanding heat temperatures, its conductive property, and importance in ensuring the circuit is connected accordingly is required to make sure that the electronic device can work independently and as it should be. Since it took multiple attempts, using the same tools but with a desoldering pump was used to salvage the components soldered in the PCB trials.