During the robot project, my main tasks were to implement the various movements of the robot.

At first, I start implementing the robot's basic movements: move forward, move backward, turn left, turn right.

After this implementation and further testing, we discovered that the robot is not able to reliably turn and there is a lack of more movements.

For the next iteration of the code, the goal was to make the robot more reliable while taking an angle I use the gyroscope sensor, and the way I did it was to launch 2 thread one for getting a continuous value of the gyroscope sensor and the second one to initiate the turning angle movement of the robot and monitor the actual value of the gyroscope sensor until it reaches the desired angle by taking in count the gyroscope sensor error plus the time to stop the motor. In the same timeline, I’ve added a timed based movement to the robot allowing him to move for a given period of time.

Now the robot has a more reliable way to move but still needed to detect when it gets stuck either by touching the cube or the fence. To solve this, we decided to use the touch sensor. During a robot movement, it will set command and start moving so when the command is set, we can check if the button is pressed or not if it is, the action will be to immediately stop the robot.

The last step was to convert centimeters to tacho count per meter so to achieve this we needed to take into account our robot environments, the wheels radius, and diameters from these parameters we were able to convert centimeters to tacho count. The issue was when we try to give the robot a longer distance ~100cm and plus, the robot starts to be less reliable it will reach the supposed target by some centimeters off. The solution to this issue was to move the robot at a small distance (e.g., 10 cm) and cumulate it until it reaches our desired centimeters. After using this approach, we are making sure that the robot can reach the destination reliably.