TASK 4

Unidirectional & Bidirectional Square Path Experiment - In this task the robot, follows a path comprising of four straight line segments and four pure rotations about the robot's center point, at the corners of the square. The robot's end position visualizes the dead-reckoning error.

1. Install latest Arduino IDE, open “Sketch” menu, “Include Library”, then “Manage Libraries..”, and install “Romi32U4” library
2. Open “SquareMove.ino” found within the GitHub repository for Task 4. Note that there are several parameters established within the code which include motor_power, motor_offset, wheel_d, wheel_c, and counts_per_rev. These parameters are described in Task 3.
3. Two additional parameters include separate drive_distance values - one for the function goStraight() and one for the function turn90(). These values ultimately determine how far the robot must drive straight and the distance needed to make a 90 degree turn. The 90 degree turn distance is found by multiplying the degree of a turn wanted (in radians) by the radius of the Romi - measured from the center of a wheel.
4. Following these parameters, the number of wheel revolutions needed to obtain a each certain distance was found and stored in the variable num_rev which was then converted to a tick count and stored in the variable target_count forthe functions goStraight() and turn90().
5. A PID version of the square move utilizing dead-reckoning is shown for Task 6.

Video:
https://www.youtube.com/watch?v=9JrKoQNQo2g