

TASK 6

Dead reckoning - Using the of motor encoder values, calculate the robot's position and pose for the motor basic test.

1. Install latest Arduino IDE, open “Sketch” menu, “Include Library”, then “Manage Libraries..”, and install “Romi32U4” library
2. Open “DeadReckoner.ino” found within the GitHub repository for Task 6.
3. In this case, the parameters are the same as those established for Task 5. However, within this code there are several while loops utilized to perform movements that allow Romi to move forward for a specified distance and to rotate a specified angle. Unlike Task 4, an additional header known as Romi32U4Odometer.h was utilized to obtain the estimated position along the X and Y axis, as well as the orientation with respect to this same X-Y plane. In turn, the X-Y plane utilized represented Romi’s position with respect to the global frame.
4. As a result of (3), the square maneuver for Romi was found by moving Romi along any given axis a specified distance to be determined by the odometer library. The rotation angle was also found through the odometer library. In turn, Romi’s position was always with respect to the global frame. However, it is worth noting this did lead to error in the final position as is illustrated in the video. This error was only compounded by the stopping tolerance used for both angular and linear maneuvers. The tolerances for the movements was defined by the variables tolForDist and tolForAngle, which in the video allows for the tolerance for the distance to be within ± 20 ticks and the angle to be $\pm 2^\circ$.

Video:

<https://www.youtube.com/watch?v=SvEHHPOv3NA>