HW 1: Publishers and Turtlesim

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Repository: https://github.com/michaeladeleke2/hw1-turtlesim

Circle Publisher

For the circle program, I used a publisher that constantly sends both a forward linear velocity and a steady angular velocity to the turtle. This combination makes the turtle move forward while continuously turning, which produces a circular path. I calculated the time needed for the turtle to make a full circle based on the angular velocity. Once the circle is completed, the node stops sending commands so the turtle comes to a halt.

Rectangle Publisher

The rectangle program switches between moving the turtle straight and making 90-degree turns. Each side of the rectangle is drawn by publishing a forward velocity for a set amount of time, followed by a timed angular velocity that rotates the turtle. This sequence is repeated four times to complete the full rectangle shape. At the end, the program sends a stop command to keep the turtle still.

Diamond Publisher

The diamond program is very similar to the rectangle, but it starts by turning the turtle 45 degrees to change its orientation. After that, it follows the same logic as the rectangle by moving forward and then making 90-degree turns. Because of the initial angle offset, the shape appears as a diamond with equal sides rather than a square. Once all sides are complete, the turtle is stopped with a final zero-velocity command.

Random Publisher

For the random program, I created a publisher that sends forward velocity while occasionally adding a random angular velocity. This makes the turtle wander in unpredictable patterns instead of following a strict shape. To prevent it from leaving the turtlesim boundaries, the node also checks the turtle’s position and forces turns back toward the center when it gets too close to the edges. The program runs for a set amount of time and then stops the turtle.

Build & Run Instructions

Build:

1. Go to your workspace: cd ros2_ws
2. Build the package: colcon build --symlink-install --packages-select hw1
3. Source the workspace: source install/setup.bash

Run:

- In Terminal A: ros2 run turtlesim turtlesim_node
- In Terminal B: ros2 run hw1 circle (or rectangle, diamond, random)