

Unit Tests

1. Test Velocity Task Calculation.
 - a. Cut around the velocity task to isolate and test the physics calculations. Input pretend 16-bit gyro numbers, as well as previous x and y velocities. Check that the updated velocities are as expected. PASSED
2. Test Position Task Calculation
 - a. Cut around the position task to isolate and test motion calculations. Input pretend velocities, previous positions, obstacles enabled boolean, and map. Early on there will probably not be any obstacles, only a ball moving around the screen, so the first unit tests will reflect this (only have the first two mock inputs). Check that position is updated correctly, or (later on) that game status is updated correctly in case of win/loss. PASSED

Functional Tests

1. Test ball control. Set board still on table. Begin the game and observe that the ball does not move. Tilt the board along the y-axis and hold still again (at angle). Observe that the ball accelerates in the y-direction. Tilt the other way and observe the ball slow down and eventually move in the opposite direction. PASSED
 - a. Repeat for x-axis. PASSED
2. Test that walls impede motion. Begin game. Tilt board to move the ball towards a wall. Observe that the ball moves in that direction until it hits the wall. Observe that a corner can stop the ball's motion in both directions. PASSED
3. Test that the ball can fall in holes. Begin game. Move the ball towards the hole. Observe that when the ball's center crosses over the hole, the game is lost. PASSED
4. Test game loss for falling off edge. Set HARD_EDGED to 0. Begin game. Steer towards the edge of the map and eventually off the edge. Observe that game is lost. PASSED
5. Test disruptor effect on wall. Move the ball towards the wall until the wall stops its motion. Ensure the disruptor is charged (check that green LED is on and red is off). Hold the button and observe that the ball moves through the wall. PASSED
6. Test disruptor effect on hole. Ensure the disruptor is charged (check that green LED is on and red is off). Place the ball near the hole. Hold the button while moving over the hole. Observe that the game is not lost. PASSED
7. Test that waypoints are recorded. Begin game. Go to waypoints in order until game win/loss. Observe that the correct number of waypoints reached is displayed on the game end screen. PASSED
8. Test green LED. Begin game. Observe that the green LED is on. Hold button. Observe that the green LED becomes gradually dimmer until it is completely off. PASSED
9. Test red LED. Begin game. Hold button to deplete disruptor energy (green LED is off). Observe that the red LED blinks with decreasing period until it is off. Observe that the green LED is on again at this point. PASSED

Testing Status

Both unit tests passed, and all functional tests are now passing.