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%Test script for Car Steering Simulation

clc, clear

%straight line u=0
try
    [x,y,E] = Simulation(0, 1, 0, 0,0,0,0,0,0,15);
    assert(round(x(end)) == 15)
    disp("u=0 passed")
catch
    disp("u=0 Failed")
end

%circle u=constant
L=0;
try
    [x,y,E] = Simulation(0.5, 1, 0, 0,0,0,0,0,0,15);
    for i = 1:length(x) - 1
        L = L + sqrt((x(i+1) - x(i))^2 + (y(i+1)-y(i))^2);
    end
    assert(L - 15 < 0.5)
    disp("u=constant passed")
catch
    disp("u=constant failed")
end

%increasing u leads to decreasing radius test
try
    [x,y, E] = Simulation(0.25, 5, 0.1, 265, 8.3e-15, 1, -1, 1, 0, 15);
    r1 = abs((max(y) - min(y))/2);
    [x,y, E] = Simulation(0.5, 5, 0.1, 265, 8.3e-15, 1, -1, 1, 0, 15);
    r2 = abs((max(y) - min(y))/2);
    assert(r2<r1)
    disp("passed increasing u = decreasing radius test")
catch
    disp("increasing u test failed")
end

%auto test for straight line
try
    [x,y, E] = Simulation(NaN, 1, 0, 0, 0, 0, 0, 1, 0, 15);
    assert(E < 0.5)
    disp("u=auto passed")
catch
    disp("u=auto failed")
end

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