Project 4 - PID Controller

Compiling:
The code compiles without any errors.

Implementation:
Lesson instructions were used for implementation.

Reflection:
The hyper parameters were varied individually to understand their impact on the controller.

Proportional Gain Constant:
As proportional gain constant was increased the overshoots became larger and larger until the car went off the road and crashed or sunk into the lake.

Derivative Gain Constant:
The addition of the derivative gain helped stabilize the controller and damp out the oscillations. But as the derivative gain increased the speed of the car got restricted. The car slowed down and would not reach the throttle set speed even on a straight road. Also, the motion of the car became jittery for higher values of the constant.

Integral Gain Constant:
This constant helped in removing the steady state error which but only on relatively straight roads.

Hyper parameters were tuned manually by observations. It would be possible to get finer tuning using other techniques but it seems PID is not an optimal controller for this application.

Simulation:
Project goal met.