The PID parameters were tuned manually through trial and error..

The final PID values were set to be 0.25, 0, and -0.75, respectively. The car was able to successfully drive multiple laps around the track despite oscillating steering.

Here are the effect of each parameter:

* P( proportional control) generates a steering correction proportional to the cross track error (cte). The higher the P value, the larger and more responsive the correction is. However, a too large P would result in overshooting and oscillation in steering control.
* I (integral control) plays an indispensable role if there is a drift in the system. It generates a control signal that is proportional to the accumulation of the cte over time. Since the simulator doesn't seem to have a drift issue.
* D (derivative control) contributes a correction proportional to the changing rate of the cte. It helps 'damp' the overshooting caused by P. However, if D is overly large, it would induce too much damping and make the system hard to take prompt responses.