PID Controller

Compilation

CRITERIA	MEETS SPECIFICATIONS	STUDENT COMMENTS
Your code should compile.	Code must compile without errors with `cmake` and `make`. Given that we've made CMakeLists.txt as general as possible, it's recommend that you do not change it unless you can guarantee that your changes will still compile on any platform.	The code compiles and the executable(pid) is created.

Implementation

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The PID procedure follows what was taught in the lessons.	It's encouraged to be creative, particularly around hyperparameter tuning/optimization. However, the base algorithm should follow what's presented in the lessons.	Stick with the basic formulas of the pid controller and able to control the car very well. In the curves the car, looks aggressive (this is due to 2.795 value of d value) but that might be controlled with another pid controller to reduce speed. The car goes around the track with out any problems upto a speed of 35 miles

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		per hour for many many laps.

Reflection

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Describe the effect each of the P, I, D components had in your implementation.	Student describes the effect of the P, I, D component of the PID algorithm in their implementation. Is it what you expected? Visual aids are encouraged, i.e. record of a small video of the car in the simulator and describe what each component is set to.	P has the direct impact on how the car moved. It always tried to bring the car to the center of the road by driving it hard to the center. Unfortunately, in this trial there is no balancing act and eventually it cant control the speed and hence goes out of the road and cant come in. To counter P, we use D so that every time there car tries to go out of the lane/road, we use it to bring it to the center hard. The I counteract the bias in the CTE which prevents the PD

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		controller from reaching the center. But in this particular case since we are using a simulator, we can consider the bias negligible or zero.
Describe how the final hyperparameters were chosen.	Student discusses how they chose the final hyperparameters (P, I, D coefficients). This could be have been done through manual tuning, twiddle, SGD, or something else, or a combination!	The parameters are chosen with 1 individually to understand the behavior in isolation. Then I is made as zero to address zero bias. Then started at 0.2 for P as in the lesson and 0 for D and from then on slowly reduced P and increased D to achieve a state where the car is staying in the lane/road. Please take a look at the videos in the videos folder of the zip file.

Simulation

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The vehicle must successfully drive a lap around the track.	No tire may leave the drivable portion of the track surface. The car may not pop up onto ledges or roll over any surfaces that would otherwise be considered unsafe (if humans were in the vehicle).	Please take a look at the videos folder in the zip file.