Development Document

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Project: Race car

Project Goal: Develop an agent that can drive around racetracks as quickly as possible.

Development Steps: (Setup)

Cloned the GitHub repo

Added MyAgent.py

Ran the program using this:

python run.py MyAgent.py 8 -g 600

Development Log 1(Till June 4th)

- At first, I just tried to make the car move forward.
- If the obstacle is close to right or left turn away
- If stuck then action =right, accelerate.
- If road is clear go straight and accelerate.

Design Decisions

- Threshold: 1.7 detects close obstacles.
- Speed checks: if speed < 0.2, car is stuck.
- Stuck fix: after 10 steps stuck force the car to turn right and accelerate.
- Obstacles avoid: if front blocked then turn opposite and brake.

Performance Results:

Average speed	0.150
Maximum speed	0.200
Time taken to complete the track	2.03 min

Development Log 2 (June 5)

Goal: Improve speed and total distance covered by changing velocity behaviour.

Design Decisions :

- Set threshold to 1.5 it detects close obstacles. Works better than 1.7.
- Speed checks = If < 0.7, keep speeding.

Code changes:

1. Increased target speed:
   Threshold = from 1.7 to 1.5
   low_speed = from 0.3 0.7

2. Added Else block:
   if velocity<min_velocity:
   if ('straight','accelerate') in possibleActions:
   action=('straight','accelerate')
   elif velocity<low_speed:
   action=('straight','accelerate') if ('straight','accelerate') in possibleActions else action

Tested:

- Set low_speed =0.7 and min_velocity=0.3 =>carshed
- Set low_speed =0.7 and Threshold = 1.6=> carshed
- Set low_speed =0.7 and Threshold = 1.5 => Pass

Observed:

- Car speed
- Whether it crashed
- Time taken for turns

Performance and results:

- Car moved faster covered the track.
- Turns were smoother with much faster speed.
- No crashes in multiple runs.

Average speed	0.180
Maximum speed	0.260
Time taken to complete the track	1.3 min