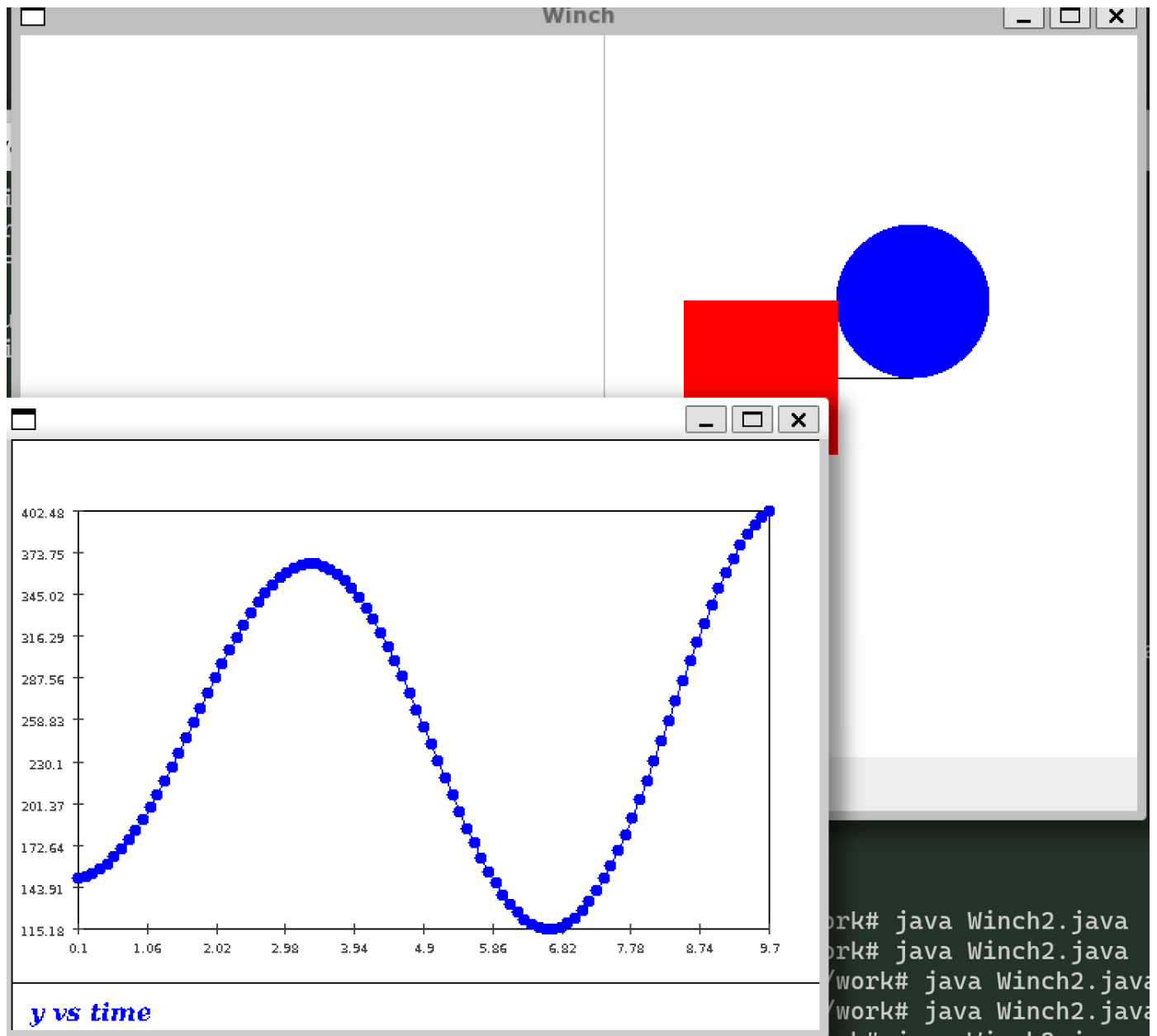


Exercise 1

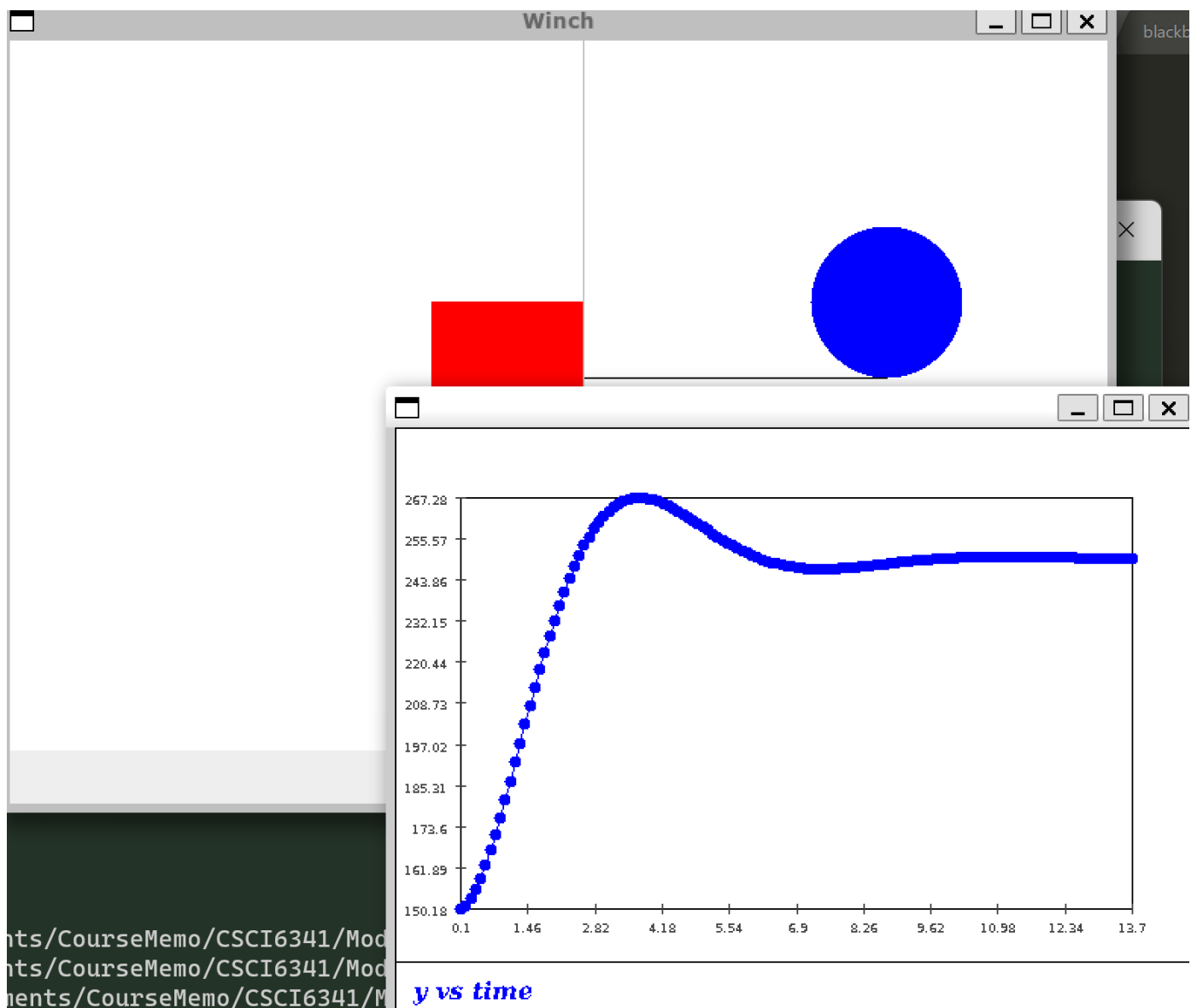
The elevator keeps speeding up and hit the winch

Exercise 2



- The winch will go up and down using this method
- If we use $V(t) = k_p(y_{Max} + y(t))$ The speed of the elevator will continue to rise and will not stop.

Exercise 3

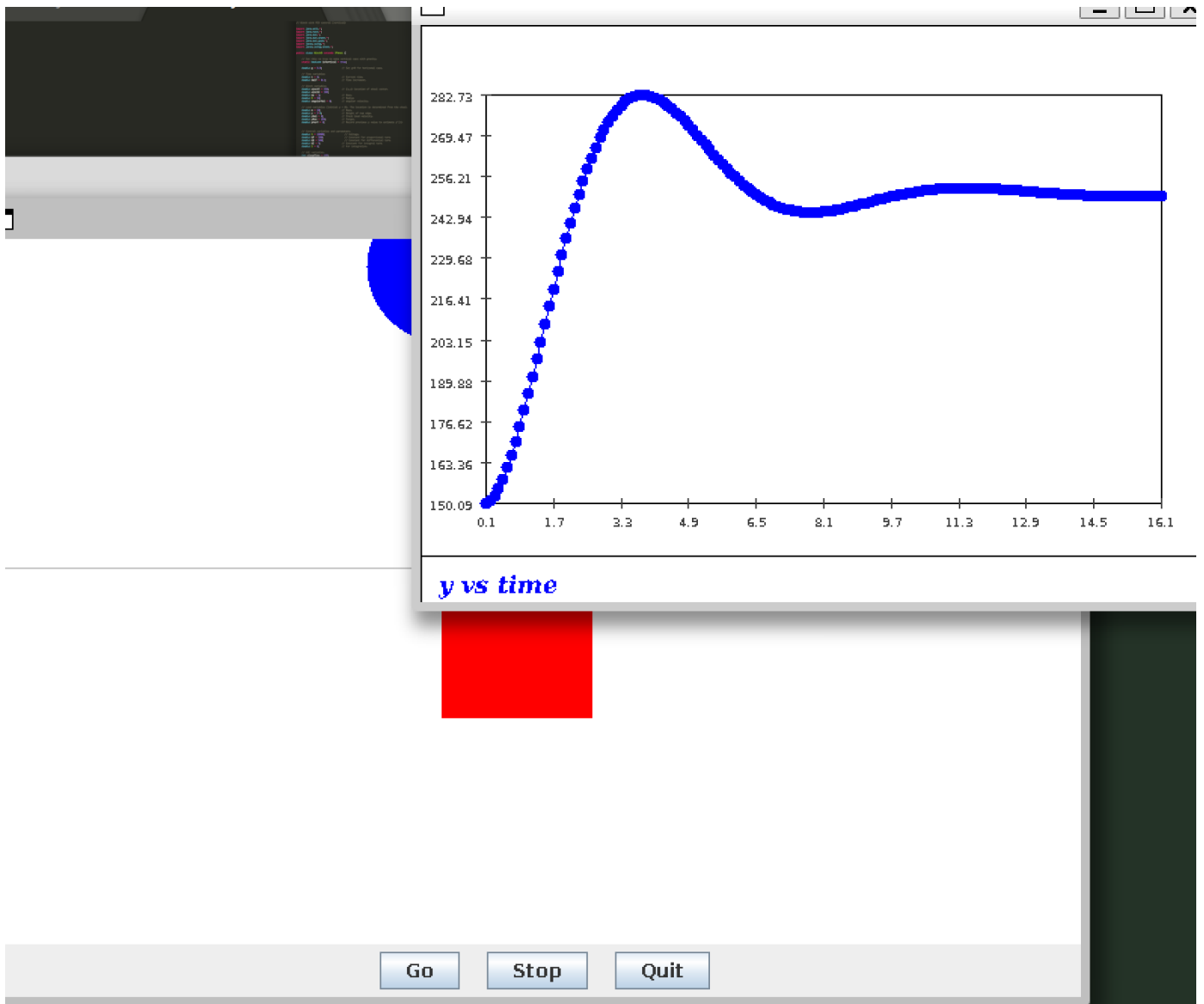


- The elevator now will stop at a certain point

Exercise 4

The Winch still moves up and down after we apply different k_p

Exercise 5



After Applying the PID, the elevator will stop.

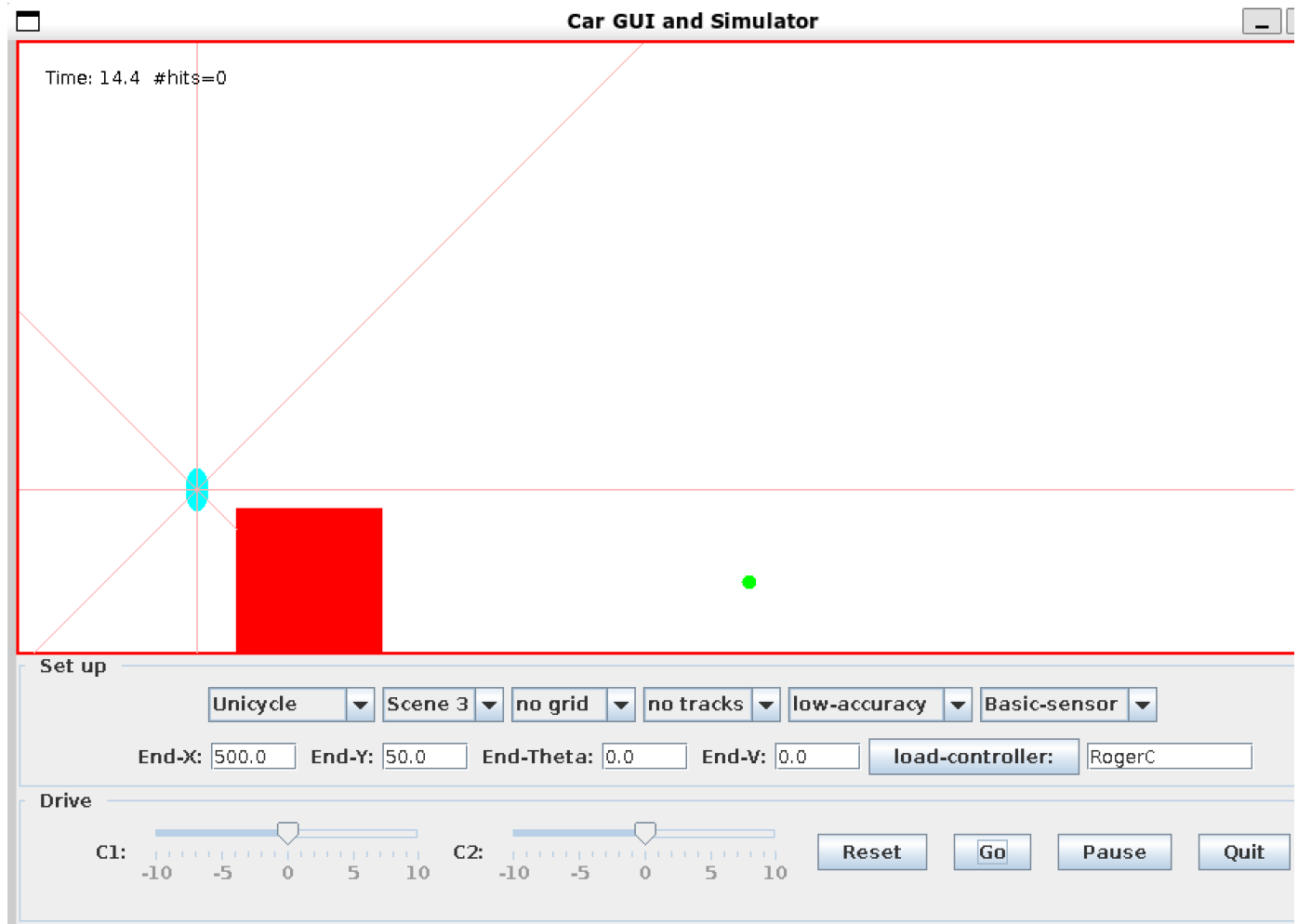
Exercise 8

The Unicycle will stuck while it's turning

Exercise 9

Yes It does, its not stuck anymore

Exercise 11



The Unicycle can turn smoothly now.

See `carSimJar/RogerC.java`

Adding a filter like `do not turn when dNE >= 40` Will solve the problem for very large dNE noise for turning

Exercise 16

See `carSimJar/MySimpleCarController3.java`

Exercise 17

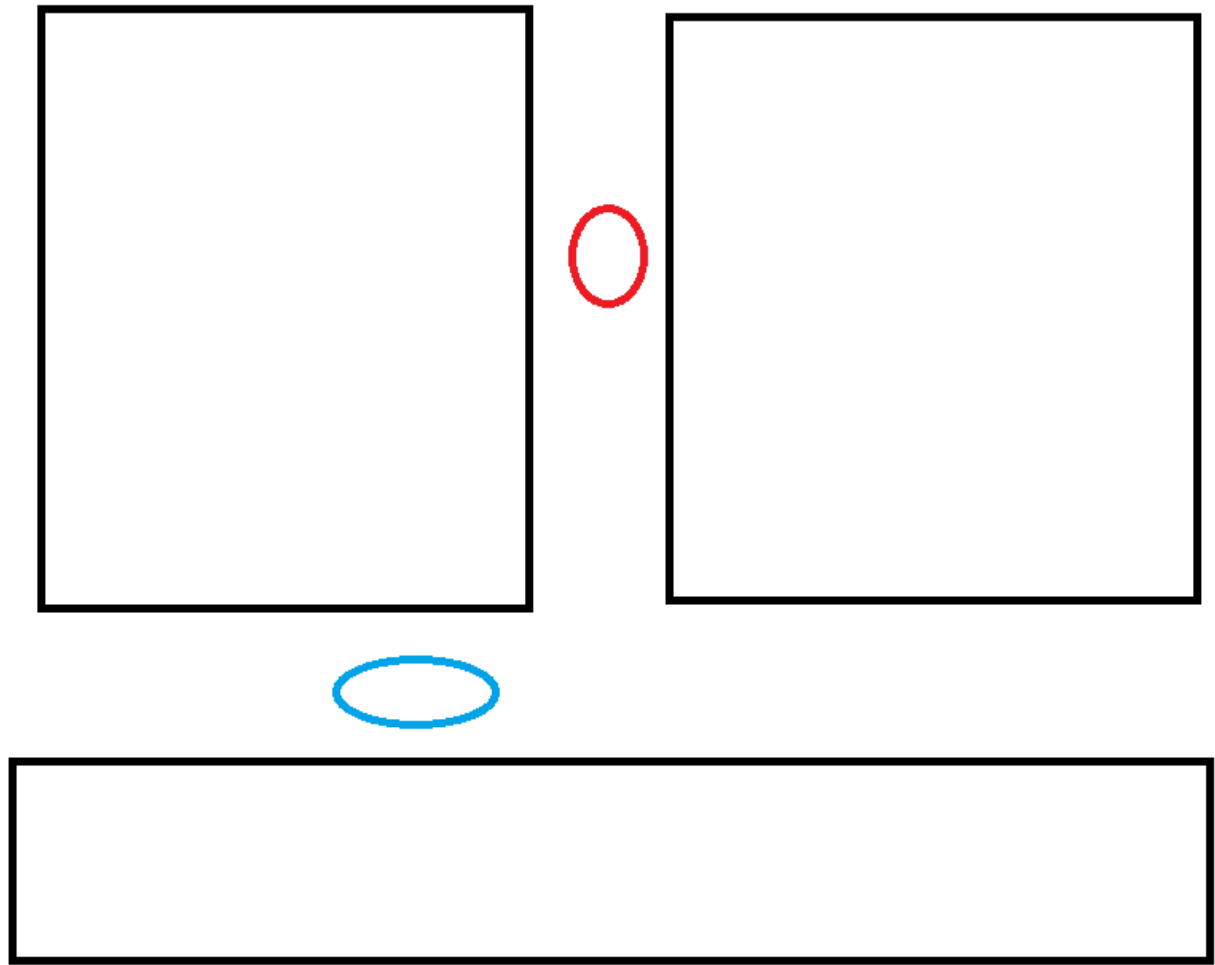
We can compare the target theta and current theta to determine which way of turning is closer.

Exercise 18

If the left size is too close, then `open-to-goal` won't trigger, result in missing the target

we can add if the goal is not on left size then we can ignore the distance from left sensors. For better trigger `open-to-goal`

Exercise 19



- The algorithm will still fail on this scenario. For following the left hand obstacle will never come to a case where distance to obstacle is less than distance to goal. So open-to-goal will never be triggered.
- We can improve the algorithm in the way that to check if there's on obstacles between car and goal. instead of distance.