ROBOT DRIVING SCHOOL

DRIVER'S LICENSE APPLICATION

When you complete a majority of these tasks, you will receive your Robot Driver's License. You may complete the tasks in any order.

CHALLENGE A:
CAUTION: SCHOOL ZONE

Drive at full "Speed Limit" until you reach the beginning of the "School Zone." Then reduce your speed through the zone. After the School Zone, return to the full Speed Limit.
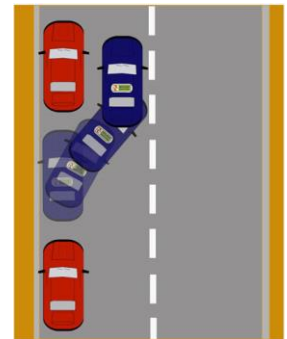
(Hint: Using a color sensor seems like the way to go!)

CHALLENGE B:
PARALLEL PARKING

When parallel parking, pull forward until you are even with the front vehicle. Then back into the space (without hitting the rear vehicle). Finally, pull forward to center yourself in the empty parking space.

(Hint: Maybe try an ultrasonic sensor?)

CHALLENGE C:
RAILROAD CROSSING

When you approach a railroad crossing, pay careful attention. Build a robot that can sense when the crossing arm lowers. If the arm is down, stop and wait for the train to cross. Drive across the tracks when the arm is up.
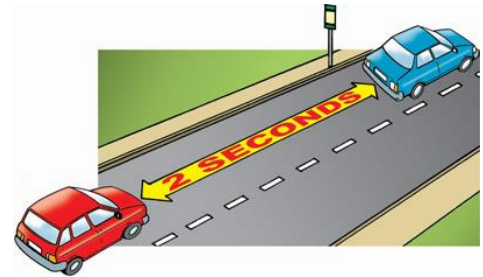
(Hint: What sensor could detect if the crossing arm is up or down?)

CHALLENGE D:
SAFE FOLLOWING DISTANCE

It is important not to get too close to other vehicles on the road.
Design a robot that can go forward when the object in front of it
is greater than 20 cm and stop if it is closer than 20 cm.

(Hint: I'm feeling good about an ultrasonic sensor here.)

CHALLENGE E:
STAY ON THE ROAD

Stay inside your lane on the road without crossing over the lines.

(Hint: Might need two color sensors here.)

CHALLENGE F:
BACK UP WARNING

Drive until you reach an obstacle. Then back up slowly with a beeping
warning and flashing a light. Now you can turn and head in another direction.
You should be able to repeat this action.

*(Hint: Touch sensor with a bumper or an ultrasonic sensor if you don't actually
want to hit anything. Flashing the EV3 button lights or color sensor could work.)*

CHALLENGE G:
REMOTE CONTROL CAR

Drive safely through our obstacle course without hitting anything. You
should control your robot remotely.

*(Hint: While you can control your robot using an Android or iPhone app for
a smart phone, for this challenge, you need to build a Bluetooth "remote control"
using another EV3 brick as a controller. THIS MUST BE DONE IN EV3 LAB SOFTWARE!)*
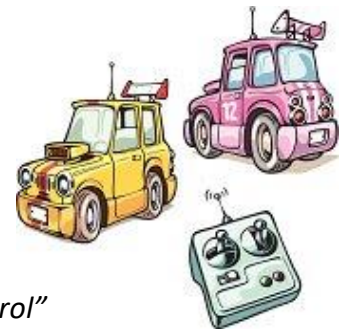
CHALLENGE H:
SPEED RACER

Create a dragster that will complete a course as quickly as possible. Use an internal timer to display your speed on the EV3 screen when you cross the finish line.

*(Hint: **Gearing up** can make your bot go faster. A **timer sensor** connected to a **display** brick can show your time.)*
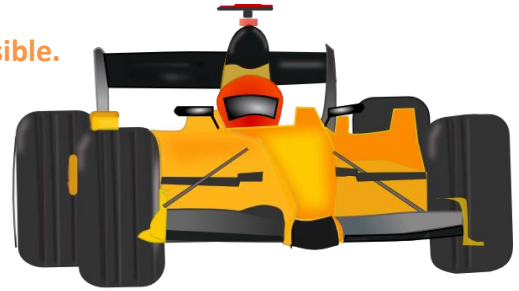
CHALLENGE I:
MOUNTAIN CLIMBING

Make a bot that can climb to the top of the hill and return safely to the bottom. Use an internal timer to display your speed on the EV3 screen when you touch the base.

*(Hint: **Gearing down** can make your bot climb better. A low center of gravity would also help! Use a **timer sensor** connected to a **display** brick can show your time.)*