Objective

This lab is intended to give you practice using variables with different data types and some of the arithmetic operators discussed in lecture. It also provides an introduction to coding standards.

Instructions

Write a program called ***racecar.c*** that calculates how far a racing car will travel in a given time, assuming that it is going at a specific, constant speed. The speed will be specified in *meters per second.* The distance should be displayed in *kilometers*. Your program must ask the user to enter the speed of the car and the number of seconds it travels.

A sample run of the program is shown below. Red text is entered by the user.

```
How fast is the car traveling (m/sec)? 10
How many seconds does the car travel? 30
In 30 seconds, the racecar will travel 0.3000 kilometers.
```

2. Before you write any code, make a plan for how you will solve this problem. Make sure you know the equation you will use for calculating distance.

3. Think about what kind of numbers you need for each quantity. Use the appropriate data types for your variables (`int` or `double`). Write your code. Compile your program. Test it and fix any bugs that you find.

4. Make sure that your program follows the coding standards on the website at:

http://windu.cpe.kmutt.ac.th/CodingStandards.html

This will be part of your grade. In particular, be sure to include a comment at the top of the program with your name, nickname, student ID and date.

6. Test your program with the following sets of values. Does it work correctly? If not, fix the problems. (Note: do not enter the commas. You also do not have to print the commas.)

Speed	Seconds traveled	Distance traveled (expected result)
20	5	0.1000 kilometers
200	100,000	20,000 kilometers
15.5	4	0.0620 kilometers
0.5	20	0.0100 kilometers
10.5	1	0.0105 kilometers

https://forms.gle/hvxaYPQfGo2774557

7. Now copy the program **racecar.c** to a new program called **racecar2.c**. Change **racecar2.c** to handle a car that is accelerating (going faster each second). You will have to ask for the *rate of acceleration* (m/sec^2) plus the starting speed, and use a different equation for calculations.

8. Test **racecar2** on the following sets of values. Notice that with a non-zero, positive acceleration, the result will always be larger than assuming constant speed (as in **racecar.c**).

Starting speed	Acceleration	Seconds traveled	Distance traveled (expected result)
20	1	5	0.1125 kilometers
200	1	100,000	5,020,000 kilometers
15.5	0.5	4	0.0660 kilometers
0.5	4	20	0.8100 kilometers
10.5	10	1	0.0155 kilometers

9. Upload **racecar.c** and **racecar2.c** using the link on the CPE100 web site. Be sure you include the header comment with your name and ID and that you follow the coding standards!