

Program 3

We will make some changes to our second program. If you recall Program #1 began with, A car's gas mileage or miles-per-gallon (MPG) can be calculated with the following Formula:

$$\text{MPG} = \text{Miles Driven} / \text{Gallons of gas used}$$

Then Program #2 added a class called **Mileage** with two private member variables called miles and gallons of type double. The class had four public methods: **setMiles** and **setGallons** used void return types; **getMiles** and **getGallons** used double return types. It had one more method called **getMPG** that performed the math calculation and returned the double **mpg**

The **MPGMain** asked the user for the number of miles driven and the gallons of gas used. It called the Mileage class to calculate the car's MPG. Then the class returned the MPG to the MPGMain where it was called and displayed the value on the screen. (Formatted display and limited the miles-per-gallon to 2 decimal places)

Program #3

Begin with Program #2 Solution file. You will need to add two more classes to the Java Project. One called **Distance** and one called **Speed**. Similar to Mileage, Distance will have two private member variables, **speed** and **time** (both doubles); Speed will have two private member variables **distance** and **time** (again both are doubles). They will need sets and gets (also called accessors and mutators). Distance should have one more method called **getDistance** that performs the math calculation and returns the double **totalDistance**. Speed should have one more method called **getMPH** that performs the math calculation and returns the double **mph**

Add a menu like the following to MPGMain:

```
Enter 1 to Determine Miles-per-Gallon
Enter 2 to Determine Distance
Enter 3 to Determine Miles-per-Hour
Enter 4 to Exit
```

The program should switch on the user's choice. The program should continue until the user enters 4. If the user enters a number greater than 4 or less than 1 the program should display an error message and prompt the user to reenter a number between 1 and 4. The program will continue to display the error message allowing the user to reenter their choice until they enter a number within the correct range.

Each case in the switch statement should create an instance of the appropriate class (for example, case 1: Mileage, case 2: Distance, case 3: Speed), and set the variable values using the set methods of the class. Each case statement should also display the results of the appropriate mathematical calculations by calling the getMPG, getDistance, or getMPH methods.

Attach the compressed folder containing the program files and folders you created. Submit it through Blackboard for grading.