# < Object Oriented Programming - Assignments #1>

1. Write a program that helps a person decide whether to buy a hybrid car. Your program's inputs should be:
   - The cost of a new car
   - The estimated miles driven per year
   - The estimated gas price
   - The efficiency in miles per gallon
   - The estimated resale value after 5 years

   Implement a **HybridCar** class and compute the total cost of owning the car for five years. (For simplicity, we will not take the cost of financing into account.)

   **[Score Criteria]**
   - Comments in javadoc format for all classes and methods [0.5pt]
   - Defining the appropriate instance variables [1pt]
   - Implementing for setting and accessing methods about all instance variables (including constructors) [0.5pt]
   - Providing test class containing a main method [1pt]
   - Output appropriateness of output results including format (submission with external report) [1pt]
   - Code accuracy with the various input cases [1pt]

   **[Example Prompt]**

```
What was the cost of the car? 15000
How many miles per year will you drive the car? 10000
What is the cost of a gallon of gas? 4.0
How many miles per gallon does the car average? 10
What was the resale value of the car after five years? 5000
The total cost of ownership is 30000.0
```

2. In this project, you will perform calculations with triangles. A triangle is defined by the x- and y-coordinates of its three corner points. Your job is to compute the following properties of a given triangle:
   - the lengths of all sides
   - the angles at all corners
   - the perimeter
   - the area

   Implement a **Triangle** class with appropriate methods. Supply a program that prompts a user for the corner point coordinates and produces a nicely formatted table of the triangle properties.

**[Score Criteria]**

- Comments in javadoc format for all classes and methods [0.5pt]
- Defining the appropriate instance variables [1pt]
- Implementing for setting and accessing methods about all instance variables (including constructors) [0.5pt]
- Providing test class containing a main method [1pt]
- Output appropriateness of output results including format (submission with external report) [1pt]
- Code accuracy with the various input cases [1pt]

**[Example Prompt]**

```
Vertex x1? 1
Vertex y1? 2
Vertex x2? 3
Vertex y2? 4
Vertex x3? 5
Vertex y3? 6

---------------------
| index |  x   |  y   |
---------------------
|   1   | 1.00| 2.00|
---------------------
|   2   | 3.00| 4.00|
---------------------
|   3   | 5.00| 6.00|
---------------------

--------------------------
| index | length | angle |
--------------------------
|   1   |    2.83|   0.00|
--------------------------
|   2   |    5.66|   3.14|
--------------------------
|   3   |    2.83|   0.00|
--------------------------

--------------------
| perimeter | Area |
--------------------
|      11.31|  0.00|
--------------------
```