

## Problem Description

Please write a program that can identify vehicle types by their components. Vehicle types are identified by their properties, such as frame material, number and material of the wheels, and power train. Given an input containing this information the program should be able to say what the vehicle type is (Big Wheel, Bicycle, Car, ...).

Your solution should expect an XML file as input. An XML file containing records specifying sample vehicles will be provided. It is reproduced below as well. The expected output of the solution is a report that lists each vehicle id and its type. The report should also provide a summary saying how many vehicles of each type are in the XML.

The program should be written in Java. Please provide the source code and unit tests in a runnable state. Feel free to use the accompanying Maven based project, but its use is not required if you are not familiar with Maven. Your unit tests should be written in either JUnit or TestNG.

You can spend as much time as you like on the project, but typically, we expect you to spend about an hour or two to come up with a solution and a backlog of ideas on how to improve the system.

Types of Known Vehicles by their Characteristics Use the following table as the basis for your vehicle identification. The table indicates the unique characteristics for know vehicle types.

Vehicle Type	Frame	Powertrain	Wheels
Big Wheel	Plastic	Human	3 plastic (front, rear left, rear right)
Bicycle	Metal	Human	2 metal (front, rear)
Motorcycle	Metal	Internal Combustion	2 metal (front, rear)
Hang Glider	Plastic	Bernoulli	None
Car	Metal	Internal Combustion	4 (front right, front left, rear right, rear left)

## Sample Data

In the following sample data, vehicle 1 is a Big Wheel because it has a plastic frame and 3 plastic wheels. Vehicle 2 is a bicycle because it has a metal frame, 2 metal wheels and is powered by a single human.

```
<vehicles>
  <vehicle>
    <id>vehicle 1</id>
    <frame>
      <material>plastic</material>
    </frame>
    <wheels>
      <wheel>
        <position>left rear</position>
        <material>plastic</material>
      </wheel>
      <wheel>
        <position>right rear</position>
        <material>plastic</material>
      </wheel>
      <wheel>
        <position>front</position>
        <material>plastic</material>
      </wheel>
    </wheels>
    <powertrain>
      <human/>
    </powertrain>
  </vehicle>
  <vehicle>
    <id>vehicle 2</id>
    <frame>
      <material>metal</material>
    </frame>
    <wheels>
      <wheel>
        <position>rear</position>
        <material>metal</material>
      </wheel>
      <wheel>
        <position>front</position>
        <material>metal</material>
      </wheel>
    </wheels>
    <powertrain>
      <human/>
    </powertrain>
  </vehicle>
</vehicles>
```