

# Practice: Understanding Interfaces

## 1 Problems

Here's a basic setup of classes and an interface for vehicles. Use this to answer the following question about interfaces.

```
interface IVehicle {
    // indicate how much a basic tune-up costs
    public double tuneUpCost();

    // determine whether vehicle can hold given num of passengers
    public boolean canCarry(int numPassengers);
}

public class Car implements IVehicle {
    int mileage;
    int year;
    int numDoors;

    // constructor goes here

    /**
     * indicate whether car was built before given year
     */
    public boolean builtBefore(int otherYear) {
        return this.year < otherYear;
    }
}

public class Bicycle implements IVehicle {
    int mileage;
    int numGears;

    // constructor goes here
}
```

1. What methods do you need to add to each of `Car` and `Bicycle` to get this code fragment to compile (setting aside the missing constructors)?
2. Does having a class implement an interface change how you write its constructor?
3. Should `builtBefore` be added to the `IVehicle` interface? Why or why not?
4. In the `VehicleTest` class, you want to define a `Bicycle` as follows:

```
_____ newKidsBike = new Bicycle(0, 1);
```

Which types can you use in the blank line (without causing a compile error just with this single line)?

5. Assume you defined a `Car` object as follows:

```
IVehicle oldCar = new Car(200000, 1995, 2);
```

Which methods can you call on `oldCar`, given the type that you gave it?

6. Assume you defined a `Car` object as follows:

```
Car oldCar = new Car(200000, 1995, 2);
```

Which methods can you call on `oldCar`, given the type that you gave it?

## 2 Answers

<https://brown-cs18-master.github.io/content/practice/03interfaces-sols.pdf>

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