

# Programming Technologies

## Lesson 1

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1. Create a **new** NetBeans Java **project**. The name of the project has to be your family name (if you have more family names you can choose). The name of the package has to be `testTwo`. The name of the main class is `Main`.
2. Create a **new class** named `Road` in the `testTwo` package. This class has the following attributes: `from`, `to` and `highway` (a `boolean` variable `true/false` for highways and ordinary roads). All these properties are `private`.
3. Create **getter and setter** methods for the above attributes.
4. **Add a constructor** that has 3 parameters with which the user can set all three properties of the newly instantiated `Road` object.
5. Override the **equals method** of the `Road` class so that two roads are equal if all their properties are the same.
6. Add the following **interface** to your project (into the `testTwo` package): (1p)

```
package testTwo;
public interface Map {
    public void addRoad(Road r) throws SameRoadException;
    public void printAllRoads();
}
```
7. Implementations of this interface can contain `Road` objects. The number of the `Roads` is not known in advance. `SameRoadException` is **an Exception that you have to add** to the `testTwo` package. The exception is thrown if one tries to add a new `Road` with the same parameters as a previously added road.
8. **Implement the** above **interface** in your project. The name of the implementing class is `CountryMap` and it is in the `testTwo` package. In the implementation make sure that `Roads` can be contained by instances of the class
9. New roads can be added using the `addRoad` method
10. All roads can be printed out using the `printAllRoads` method. All roads are in different lines. One line looks like this:

```
from to (highway)
```

where `highway` is an optional text, so if we have a road from `Debrecen` to `Budapest` that is a highway, and another from `Debrecen` to `Szeged` that is not a highway the following will be printed out:

```
Debrecen Budapest (highway)
Debrecen Szeged
```
11. In the main method instantiate a **new CountryMap object**. Add a new `Road` to the `CountryMap` instance with these data: `"Debrecen, Eger, true"`
12. In the main method read data for a road and add a new road to the `CountryMap` with these data. (The user has to type `"true"` or `"false"` for `highway` or not) (*It is advised to solve Ex. 10 before this exercise*)
13. Print out the `CountryMap` using the `printAllRoads` method.