Exception Handling

This assignment is designed as a standalone application. You do not need to incorporate into your earlier work. You are required to implement and embed some exception handling mechanisms into this application.

Your assignment is a simple Client registration application. There will be a single `Client` class with the following fields:

```
Name

Lastname

Age

ID

Phone Number
```

Age can be an integer and the rest can be String.

1. Implement set and get methods for all fields.
2. Write a test method that will read `Client` fields from the user.
3. For `Age` field make sure that the user enters a valid integer between 20 and 99 and check the validity by `checkAge()` method. When the `Age` is not valid, your `checkAge()` method should throw an `NotValidAgeException` which should be <u>implemented by you</u>.
4. When adding a new client to your application, you should check whether the given `ID` number is valid by `authenticateID()` method. If `ID` ("TC Kimlik No" in this context) is composed of 11 digits, with each digit identified by x_i;

$$x_1 \; x_2 \; x_3 \; x_4 \; x_5 \; x_6 \; x_7 \; x_8 \; x_9 \; x_{10} \; x_{11}$$

The following algorithm is used for authentication;

- ID must be 11 digits
- Must start with non-zero integer

- $x_{10} \equiv \left(7 * (x_1 + x_3 + x_5 + x_7 + x_9) - (x_2 + x_4 + x_6 + x_8)\right) (mod\,10)$
- $x_{11} \equiv (x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9 + x_{10}) (mod\,10)$

When the `ID` is not valid, your `authenticateID()` method should throw an `IDMismatchException` which should be <u>implemented by you</u>.

5. For the phone, the user should enter the phone in one of the following formats:
   a. XXXYYYYYYY
   b. XXX-YYYYYYY
   c. 0XXXYYYYYYY
   d. 0XXX-YYYYYYY

where XXX (3 digits) is the area code and YYYYYYY (7 digits) is the phone number. All X and Ys should be a digit. Dash (-) can be in between the area code and the phone number. Zero (0) may lead the phone number. Check the validity of the phone number by `checkPhone()` method. When the `ID` is not valid, your `checkPhone()` method should throw an `InvalidPhoneException` which should be implemented by you.

If an exception occurs during the registration, the exception handler should re-ask the problematic field again and continue gracefully.