ISO2-2023-A04-Testing-P1

Implementation

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Variable definition

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1. **Write, at least, the pseudocode of the identified method or methods.**

For this exercise, it is necessary to create a class 'Persona', which will have as attributes: name, last name, nationality, education, English certification, phone number, email and birthdate. And it will initialize objects with valid states

```
public Persona(String name, String lastName, europeanCountries nationality, String education, boolean englishCertification, String phoneNumber, String email, Date dateOfBirth) {
        super();
        this.name = name;
        this.lastName = lastName;
        this.nationality = nationality;
        this.education = education;
        this.englishCertification = englishCertification;
        this.phoneNumber = phoneNumber;
        this.email = email;
        this.dateOfBirth = dateOfBirth;
}
```

For the problem's semantics, we need to include methods that will help to determine if the person is of legal age and if they are European.

```
public boolean isLegal() {
        Date currentDate = new Date();
        long millisInYear = 1000L * 60 * 60 * 24 * 365;
        long ageInMillis = currentDate.getTime() - dateOfBirth.getTime();
```

```
                int age = (int) (ageInMillis / millisInYear);


                return age >= 18; // Check if age is 18 or older for legal age
 }


public boolean isEuropean() {
                for (europeanCountries European : europeanCountries.values()) {
                   if (European == this.nationality) {
                      return true;
                   }
                }
                return false;
}
public enum europeanCountries {
                SPAIN,
                FRANCE,
                GERMANY,
                ITALY,
                UNITED_KINGDOM,
                PORTUGAL
}
```

2. **Identify the variables that should be considered to test the method of interest.**

   In this case we have 2 variables that should be considered: age (from the isLegal method) and nationality

3. **Identify the test values for each previously identified variables mentioned above.**

	Equivalence class	Equivalent class values	Lightweight variant	Heavy variant	Error guessing
age	(-∞, 18), [18,+ (∞,)	2, 27	18	17,19	$-2^{31}-1$, $2^{31}+1$, 419
nationality	European Countries, Non European Countries	SPAIN, CHINA			NULL, ASDF

4. **Calculate the maximum possible number of test cases**
   The maximum possible number of test cases is: 4 from nationality x 8 from age = 32 test cases.

5. **Define a set of test cases to fulfill each use**

   The set of test cases following the format {age,nationality} will be:

   - SC1: {2, SPAIN}
   - SC2: {27, CHINA}
   - SC3: {18, NULL}
   - SC4: {17, ASDF}
   - SC5: {19, CHINA}
   - SC6: {$-2^{31}-1$, SPAIN}
   - SC7: {$2^{31}+1$, SPAIN}
   - SC8: {419, NULL}

6. **Define test suits to achieve pairwise coverage**
   Using Pairwise Pict Online we have generate the pairwise coverage.
   The input is the following one:

```
age:2, 27, 18, 17,19, -2^31-1, 2^31+1, 419

nationality: SPAIN, CHINA, NULL, ASDF
```

   The output is the following one:

age	nationality
419	SPAIN
-2^31-1	SPAIN
-2^31-1	ASDF
17	ASDF
27	SPAIN
2^31+1	ASDF
419	CHINA
-2^31-1	NULL
19	CHINA
18	SPAIN
-2^31-1	CHINA
19	ASDF
27	NULL
18	NULL
27	CHINA
18	CHINA
2	ASDF
2^31+1	CHINA
19	SPAIN
18	ASDF
419	ASDF
2^31+1	NULL
19	NULL
17	NULL
419	NULL
2	NULL
2^31+1	SPAIN
17	CHINA
27	ASDF
17	SPAIN
2	CHINA
2	SPAIN

7. **For code segments that include decisions, propose a set of test cases to achieve coverage of decisions.**

return age >= 18	Result
99	true
10	false

if (European == this.nationality)	Result
PORTUGAL	true
USA	false

8. **For code segments that include decisions, propose a test case suite to achieve MC/DC coverage.**

A=*return age >= 18:*

CONDITION	DECISION	DOMINANT
A	A	
true	true	A
false	false	A

A=*if (European == this.nationality)*

CONDITION	DECISION	DOMINANT
A	A	
true	true	A
false	false	A

9. **Comment on the results of the number of test cases obtained in sections 4, 5, and 6, as well as the execution of the oracles**