

Homework 3

Introduction to Test Case Generation

Due Monday, October 21, 2019

1. Problems:

Use Test Driven Development to develop a Java class `WholesaleCompany` and a Java test class `WholesaleCompanyTest` on Eclipse Java development environment. You should develop class `WholesaleCompanyTest` *before* class `WholesaleCompany`. You should also use the *code assist* (CTRL+Space) feature and the *quick fix* (CTRL+1) feature of Eclipse as much as possible.

The specification of the class `WholesaleCompany` is as follows:

```
class WholesaleCompany {
    String name;
    public wholesaleCompany(String companyName);
    public String getName();
    public int price(int numberBought, int unitPrice);
}
```

Each object of class `WholesaleCompany` contains one field: the name `name` of the company.

The constructor `wholesaleCompany(String companyName)` creates an object of class `WholesaleCompany` with the name `companyName`. The constructor initializes the field of the object with the parameter of the constructor.

The getter method `getName` returns the value of the field `name`.

The method `price(int numberBought, int unitPrice)` calculates the total price for the purchase of a product with the specific number of units bought `numberBought` and unit price `unitPrice`. The total price is rounding to the nearest integer. If `numberBought` or `unitPrice` is less than or equal to 0, the exception `IllegalArgumentException` is thrown.

A wholesale company supplies a discount for each of its products depending on the number of units bought and the price per unit. The discount increases as the number of units brought and/or the unit price increases. The discount percentages are given in the following table:

	$1 \leq \text{price} \leq 1000$	$1001 \leq \text{price}$
$1 \leq \text{number} \leq 50$	5%	10%
$51 \leq \text{number}$	10%	20%

- (a) (30%) Use the weak $N \times 1$ strategy to design a suite of test cases for the method `price`. Use a table to fill the test input and expected output for each test case.
- (b) (20%) Use the weak 1×1 strategy to design a suite of test cases for the method `price`. Use a table to fill the test input and expected output for each test case.
- (c) (30%) Write the test class `WholesaleCompanyTest` that contains the test method `testPrice` that executes the suite of test cases designed in (b).
- (d) (20%) Implement the class `WholesaleCompany`.

You don't have to write a main method in this homework. You should write comments in each test method in the test class to describe the test cases you design.

2. Handing in your homework:

You should upload a pdf file `hw3.pdf` that gives the answers for problem (a) and (b), and a compressed file `hw3.zip` that contains the package that includes both the source class `WholesaleCompany` and the test class `WholesaleCompanyTest` to the eCourse2 website.