

Lab – Test Driven Development

This document defines the lab for ["Java OOP" course @ Software University](#).

INStock

Pesho has been struggling lately. He is a major shareholder at one of the largest product manufacturers in the world. As such he is always looking for new ways to improve his game and stay on the top. He has hired you (because you are from SoftUni, therefore you are a grandmaster programmer) to create a product tracking system for him. He has a lot of products in stock so you have to make the system really fast.

- **add(Product)** – Add the new manufactured Product in stock. You will need to implement the **contains()** method as well.
- **contains(Product)** – Checks if a particular product is in stock. *Keep in mind that only labels are unique.
- **count** – Returns the number of products currently in stock.
- **find(int)** – Return the **N**-th product that was added in stock. The index is based on insertion order in the data structure. If such index is not present, throw **IndexOutOfBoundsException**.
- **changeQuantity(String,int)** –Changes the quantity of a given product by n-amount. If the particular product is not in stock, throw **IllegalArgumentException**.
- **findByLabel(String)** – Returns the product with a given label, throws **IllegalArgumentException** if no such product is in stock.
- **findFirstByAlphabeticalOrder(int)** – Returns the first **N**-th products in stock ordered by label in alphabetical order or returns an empty collection if the passed argument is out of range.
- **findAllInPriceRange(double,double)** – Returns all products within given **price** range (lower end is exclusive, higher end is inclusive). Keep in mind that they should be returned in descending order. If there are no such products, return **empty collection**.
- **findAllByPrice(double)** – Returns all products in stock with given **price** or **empty collection** if none were found.
- **findFirstMostExpensiveProducts(int)** – Returns the first **N** products with **highest** price in stock or throw **IllegalArgumentException** if less than **counts** exist.
- **findAllByQuantity(int)** – Returns all products in stock with given remaining **quantity**. If there is no product with identical quantity, return **empty collection**.
- **getIterable<Product>()** – Returns all products in stock.

Duplicates of the product class **are allowed**. That means that the price and quantity of multiple objects might be the same (**It is acceptable for the quantity to be 0**). There will be no duplicate references or labels. **The input will always be valid**.

Input / Output

You are given an **IntelliJ Java** project holding the interface **ProductStock** that extends **Iterable<Product>**, the unfinished classes **Instock** and **Product**.

Your task is to **finish this class** and to create tests that run correctly.

- You are **not allowed to change the interface**.
- You can add to the **Product** class, but don't remove anything.
- You can edit the **Instock** class if it implements the **ProductStock** interface.

Interface

The interface **ProductStock** looks like the code below:

```
public interface ProductStock extends Iterable<Product> {  
    //getter  
    int getCount();  
  
    //Validations  
    boolean contains(Product product);  
  
    //Modifications  
    void add(Product product);  
  
    void changeQuantity(String product, int quantity);  
  
    //Retrievals  
    Product find(int index);  
  
    Product findByLabel(String label);  
  
    Iterable<Product> findFirstByAlphabeticalOrder(int count);  
  
    //Querying  
    Iterable<Product> findAllInRange(double lo, double hi);  
  
    Iterable<Product> findAllByPrice(double price);  
  
    Iterable<Product> findFirstMostExpensiveProducts(int count);  
  
    Iterable<Product> findAllByQuantity(int quantity);  
}
```