Lab 6

a. Given is the customers application which contains a CustomerCollection class with a list of customers.
   Write an AgeIterator that iterates over the customer collection and returns the customer with the lowest age first, then the customer with the 2nd lowest age, etc.

b. Write a filter iterator that can filter out customers based on their address. Using this filter iterator show the following customers:
   1. All customers from Chicago
   2. All customers whose zip code starts with “12”

c. Write an iterator that iterates only over the customers, but after every customer it skips the next customer. So the iterator returns first customer 1, then customer 3, then customer 5, etc.

d. Suppose you have to write an XML parser. Draw the class diagram of the domain model for this XML parser without using the composite pattern.

e. Draw the class diagram of the domain model for this XML parser using the composite pattern

f. Explain the advantage and/or disadvantage of the design of part c and part d.

g. Suppose we have a webshop where the product catalog consists of categories and products. Categories can contain sub-categories and products. Sub-categories can have sub-categories and products. Design this with the composite pattern and implement it in Java. Write code to test your application, for example print out the whole product catalog with all categories and products