OOD - Individual assignment: Pizza shop revisited

You are tasked to create a Windows form application for a shop's cash register. A customer can order the following products:

- Pizzas,
- Drinks.

With this application it should be possible to manage the customers and the orders placed. In addition, saving and loading the data in the application as a file is also required.

Disclaimer
This is an individual assignment to give you better insight about your proficiency related to the covered concepts in OOD and the learning outcomes. Your teacher will give you a formative indication and feedback to help you understand your proficiency.

Note that this assignment is individual and is used by your teacher to help you get to the expected proficiency for OOD. For this reason, it must be your own code and you are not allowed to copy any part of it from your fellow peers. Your teacher will give you feedback about what you submit and we assume that it is your own code and that you understand it fully.

The end-user of the application must at least be able to do the following:

- **FR-C1: Add a new customer**
  This must adhere to the data constraints about a customer.
- **FR-C2: Modify an existing customer**
  This must adhere to the data constraints about a customer.
- **FR-O1: Add a new order for a client**
  This must adhere to the data constraints about an order.
- **FR-O2: Cancel an existing order**
- **FR-O3: See the receipt of an existing order**
  See *Appendix A: Order receipt example* for an example receipt of an order.
- **FR-S1: See the revenue of the shop**
  It should either be the total revenue or for a specific day.
- **FR-S2: See an overview of the orders**
  It must be possible to view the order sorted by the most expensive order at the top and the cheapest at the bottom.
- **FR-S3: Persistent shop data**
  It must be possible to save and load shop data to and from a file.

You will have to work with data related to a client or order for some functional requirements. The descriptions of these entities can be found below.

A customer
The shop only requires you to store certain data of a customer, but you may want to extend this with (for instance) an id.
As a minimum, the following data should be stored:

	Description	Constraints
Name	The full name of the customer	Required data.
Email address	The email address of the customer	Optional for the customer to fill in. But when an email address is entered, it must have a valid format (i.e. one @-character must be present).

An order
The shop only sells pizzas and drinks and is part of the data stored with an order. An order should contain at least one Pizza or Drink. At the very least the following data should be stored:

	Description	Constraints
Customer	The customer placing the order	Required data.
Timestamp	The date and time of when the order was placed	Required data.
Pizza(s)	The pizza(s) the customer wants.	An order may have one or more pizzas. A pizza can have either a *thin*, *thick* or *cheese filled* crust, with different pre-defines toppings (e.g. *margherita, quattro formaggi, quattro stagioni, pepperoni, BBQ chicken, etc.).* The combination of crust and topping determines what name and price the pizza has.
Drinks(s)	The drinks the customer wants	An order may have one or more drinks. Note that a drink has a name and price.

The assignment
First analyse the case described above and design the classes for your application; make sure all functional requirements are supported by your design. To help you out, you can use test data found in *Appendix B: Test data*.
Note that it is expected that you use of the programming concepts covered during semester 1 and OOD.

After you have determined what the classes and its members are, you can start implementing the code in a Windows Form application. You may decide yourself what controls to add and how to show the customers and orders, but just be sure to keep user in mind (e.g. proper information shown, monkey proofing, user friendly layout, etc.).

Be sure to submit the solution of this assignment before the deadline on Canvas; both the implemented functionalities and code quality will be reviewed.

Appendix A: Order receipt example

The Mario and Luigi Pizza shop

Pizza margherita

1 x € 5,99	€ 5,99

Pizza quattro formaggi - thick

1 x € 8,50	€ 8,50

Ice tea

2 x € 2.75	€ 5,50

TOTAL	€ 19,99

ORDERED BY John Doe ON 28/02/2020 13:21

Appendix B: Test data

Customers

Name	Email
John Doe	j.doe@hotmail.com
Donal Duck	
Berta 15	berta15@cow.farm.nl

Drinks

Name	Price
Flat water	€ 2.50
Sparkling water	€ 2.50
Cola	€ 2.75
Ice tea	€ 2.75
Energy drink	€ 3.75

Pizzas; note that the thin crust is the default crust and not included in the name

Name	Price
Pizza margherita	€ 5,99
Pizza margherita - thick	€ 6,50
Pizza margherita - filled	€ 7,95
Pizza quattro formaggi	€ 7,99
Pizza quattro formaggi - thick	€ 8,50
Pizza quattro formaggi - filled	€ 9,95
Pizza quattro stagioni	€ 7,49
Pizza quattro stagioni - thick	€ 6,00
Pizza quattro stagioni - filled	€ 7,45
Pizza pepperoni	€ 6,99
Pizza pepperoni - thick	€ 7,50
Pizza pepperoni - filled	€ 8,95
Pizza BBQ chicken	€ 6,99
Pizza BBQ chicken - thick	€ 7,50
Pizza BBQ chicken - filled	€ 8,95

HINT: All pizzas have a base price of €5,99. Depending on the chosen crust and topping, surcharges are added to this base price. Can you come up with a smart way to implement this price of a pizza?