

Complex Systems Final Project

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Our project is an online store with electronics. In database, there are 5 tables:

- clients
- contractors
- invoice
- invoiceitems
- products,

which are 2NF and 3NF normalized.

In *clients* we store username, password and salt for store users, which might log in to store or register if they don't have an account and then, using trigger, we add a new client to *contractors* table. They can see all products - name, price and quantity, but also filter them by name(dynamic query builder), sort by their properties, then add them to cart and buy. After purchase, we insert new *invoice* with data, value, buyerID and all products which were bought are added to *invoiceitems* with invoiceID.

To database have access 4 different types of users: CEO, Admin, Accountant, Client. Each of them has different functionalities. Admin can do everything - see all tables, insert, update and delete records, also as only user can do backup and restore database. CEO is responsible for adding contractors and ordering products. Accountant can only view and delete invoices.

To prevent SQL injection, in backend we use parametrized query which prevent hacker attacks and using salt for login and registration of users helps to keep data safe.

We have used transactions in two scenarios. First when realizing client order. We had to check if there is enough product to sell. Second scenario when CEO is buying product to fill stock, this one is implemented on SQL side.

We have used parametrized query in basically every SQL command since C# SQL Connector uses it by default if you use parameters. But to show a different way, we also created a stored procedure with prepared statement to fetch the desired invoice.

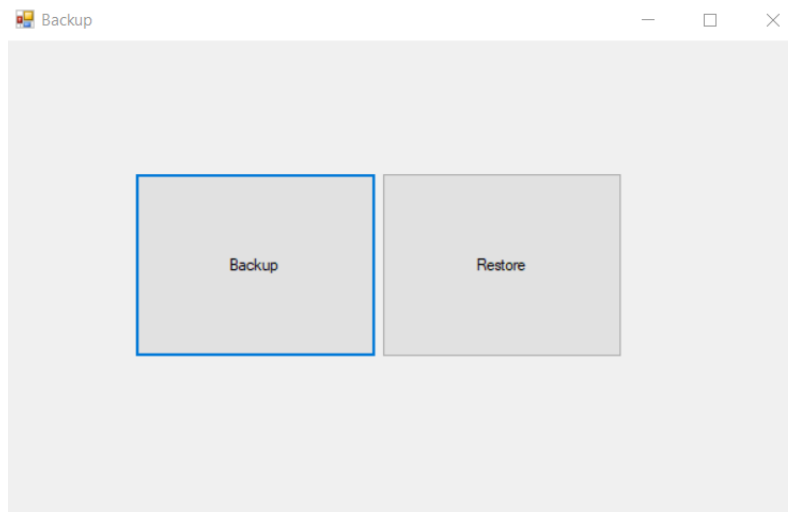


Figure 1: Backup and restore form

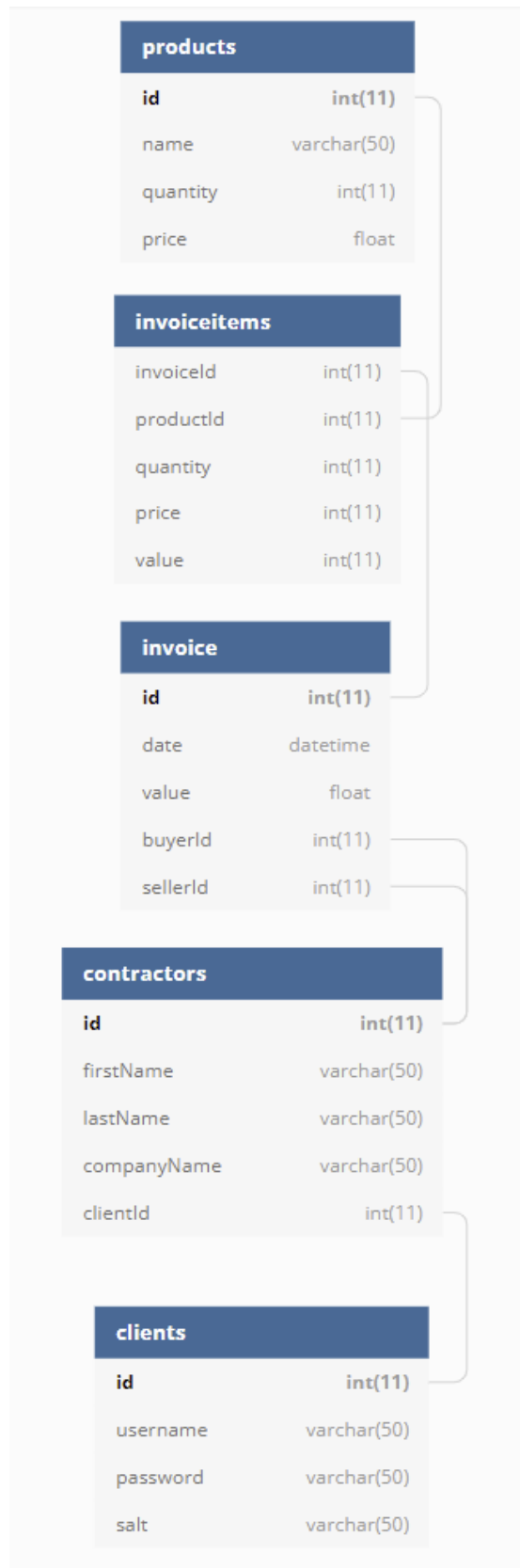


Figure 2: UML Diagram

UpdateStock

Products

Search:

	id	name	quantity	price
▶	1	Iphone 11 64GB	21	2499
	2	Iphone 20 128GB	12	4401
	3	Iphone 12 128GB	13	3999
	4	Iphone 12 64GB	17	3499
	5	Iphone 13 256GB	4	4699
	6	Iphone 12 256GB	9	4099
	7	Smasung Galaxy S21 FE 6/...	94	3499
	8	Smasung Galaxy M52 6/128...	497	1499
	9	Samsung Galaxy Z Flip 3 8/...	10	4299
	10	Samsung Galaxy Z Fold 3 1...	3	7999
	11	Ipad Pro 512GB Wi-Fi	100	6999
	12	Ipad Pro 1000GB LTE Wi-Fi	98	7499
	13	Samsung Galaxy Tab A8 4/...	100	1149
	14	Ipad Pro 128GB LTE Wi-Fi	50	5999,99
	15	Samsung Galaxy Tab S6 Lt...	189	1599
	16	Ipad Pro 128GB Wi-Fi	20	4999,99
	17	Samsung Galaxy Tab S6 Lt...	25	1899
	18	Samsung Galaxy Tab A8 4/...	50	1399
	19	Samsung Galaxy Tab A8 4/...	100	1399
	20	Samsung Galaxy Tab A7 3/...	100	649,99
	21	PlayStation 5 Digital Edition	10	2299
	22	PlayStation 5	10	2499,99
	23	Xbox Series X	50	2799

Product

Id:

1

Name:

Iphone 11 64GB

Update

Quantity:

21

Price:

2499

Contractor:

2 KOMPUTRONIK

Buy more

Name:

Price:

Add product

Figure 3: Managing stock by CEO

Invoice

Invoice:

18

Show invoice

Delete invoice

Invoice Info :

Invoice id:

18

Invoice value:

2499

BUYER :

1 Super SHOP

SELLER :

2 KOMPUTRONIK

productID	name	quantity	price	value
1	Iphone 11 64GB	1	2499	2499

Figure 4: Invoice preview