

CSCI 5/430 Project 1.

We will work on this for the next few weeks, applying concepts as we learn them. There will be several due dates, for completing various tasks. **You will be working on the project as a group. Please upload only one submission per group, except for some parts that will be marked as individual submission. As the assignments become due, they will be posted on D2L.**

First due date: Noon on Monday, Sept 9

Before starting on this assignment, you should have read Chapter 3 (3rd ed) from D2L, completed all activities for the first two weeks, and also read Chapter 6 from the text book (2nd ed).

Complete the following tasks by Sept 9:

1. Draw up a list of business processes with a short description of each. (As an example, see section 6.2.1 in text).
2. Find all the nouns in the requirements and the business process. Decide which concepts are entities that should be represented in the (conceptual) logical model. Explain why you are choosing these and not the others. (As an example, see section 6.4 in text)
3. Diagram showing these entities (also called the conceptual classes) and their relationships. (As an example, see Figure 6.9 in text)
4. Use-case diagram, assuming there is a single trusted actor performing all the operations (read Chap 3, 3rd ed on D2L).

In this assignment, you will design and implement an object-oriented database system that tracks activities for a small warehouse. Some business terms:

Client: Customers who order things from warehouse

Product: Items that are stocked in the warehouse.

Sale price: Price paid by the customer for a specific product.

Wishlist: Products, with quantities, in which a customer has indicated interest, i.e., placed in a shopping cart.

Waitlist: Quantities of products with customer that placed order; these are not available yet, waiting for shipment of product to arrive.

Order: A client's request for a list of products with associated quantity for each product.

Invoice: A list of products, associated quantities and unit sales prices, and total cost for a package that is being shipped to a client.

The business has the following requirements for the system. *Note that some of these requirements correspond to a single business process, some to multiple business processes, and some re-*

quirements may only influence how a business process should be implemented :

1. Tracking clients. Note that deletion is not required. **The ID for clients must be generated by the system.** Clients added one at a time; each client has to provide a name and address
2. Tracking products. Note that deletion is not required. **The ID for products must be generated by the system.** Allow for adding multiple products simultaneously; product added with a name, amount in stock, and a sale price.
3. Keeping track of customer transactions. Whenever there is a transaction involving a customer, the system keeps a record. Each transaction has just a date, a descriptive string and a number (for a dollar amount).
4. Keeping track of customer's wishlist. A client should be able to specify a product and an associated quantity that they plan to purchase in the near future; the system will keep track of all this information.
5. Process a client's order (i.e. proceed to check-out). When a client requests to process their order, the system goes over the client's wishlist and asks if each of the items should be ordered, and a quantity for each. Whenever the client answers yes, the product and quantity are added to the order and the product is removed from the clients wishlist. Next it asks if the client wants to add any more products (with quantities) and adds them to the order. Then the system creates an *invoice* that shows all the products and quantities that can be shipped at that time. The items that cannot be shipped are wait-listed. The total amount due (total cost of all products being shipped) is debited to the Clients' account.
6. Generate Invoices. An invoice consists of a set of products with associated quantities and sale prices, and a total cost. Invoices result when customer orders are processed, or when wait-listed items become available.
7. Accept payment from a client. The amount is credited to the customer's account. Note that a client order can be processed and shipped before the payment has been made. In other words, placing and processing the orders is independent of the payment process.
8. Accept a shipment for a product. Shipment details specify a productid and quantity. Wait-listed orders must be filled first, before amount in stock is updated.
9. **Queries to be processed.** The following queries must be handled:
 - List all transactions for a specified client.

- List all clients who have an outstanding balance.
 - List all products, quantity in stock, and total quantity of outstanding(waitlisted) orders.
10. **Additional queries.** As you build the system you will need some queries to verify that the system is behaving correctly. These should be added as required. Your overall submission will be evaluated for testability - for every business process implemented, it should be possible to easily query the system and verify that the implementation is correct. As an example, if you are adding clients, need a query “print all clients” to verify correctness