CSCI 5/430 Project 1.   Due dates: TBA.

In this assignment, you will design and implement an object-oriented database system that tracks activities for the small warehouse, using the following requirements.

1. Adding clients, products and manufacturers. Note that deletion is not required. **The ID for clients must be generated by the system.** Allow adding multiple products in one activity.

2. Every product has a list of suppliers, i.e., the manufacturers for the product. The supply (or purchase) price must be stored for each (product, supplier) pair. If a manufacturer provides a certain product, we say that the manufacturer is a supplier for the product.

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 an number (for a dollar amount).

4. Accept and Process Customers' orders. Each order has a set of products and an associated quantity for each one; we add products(with quantities) one by one. Details of the order are recorded. The system creates an *invoice* that shows all the products and quantities that can be shipped at that time. The items that cannot be filled are wait-listed. *Order Processing can be done concurrently with the acceptance of the order.* Customer is billed when the processing is completed, i.e., payment is not needed immediately.

5. Keeping track of inventory. For each product we track the sale price, amount in stock, and the list of wait-listed orders for that product. We need to query the list of suppliers for a product.

6. Record an order placed with a manufacturer. **Only for the larger groups**(3 students in 530 or 4 students in 430). The clerk provides a supplierid, productId, orderId and quantity. System keeps a record of all the orders associated with a product. this is maintained in the system.

7. Generating an invoice. 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.

8. Accept payment from a customer. 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.

9. Accept a shipment from a supplier. Clerk provides productid and quantity. wait-listed orders must be filled first, before inventory is updated. When the wait-listed orders are being filled, the system displays each one in turn, and the clerk answers Y/N. If the clerk answers Y, the order is filled; otherwise the system moves to the next one until it either runs out of stock or reaches the end of the wait-list. Any remaining quantity is added to the inventory.

   For Large groups. The input is only the productId. The matching order may not be unique, so the system must list the outstanding orders (the manufacturer name and quantity are displayed) for this product, one by one, until the clerk answers Y. After the match is found, system asks the clerk for the quantity received and makes a record of this. If the quantity received is too much (more than the quantity remaining on the order), it notifies the clerk and asks for the quantity that should be accepted. It then proceeds to process the the information as described earlier.

10. **Queries to be processed.** The following queries must be handled:

    - List all transactions for a client.

    - List all manufacturers and their prices for a given product.

    - List all clients who have an outstanding balance.

11. **Other miscellanea.** 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 - whenever a transaction is done, it should be possible to easily query the system and verify that the appropriate changes were made.