Homework 3

**Reading Assignment:** read Lessons 5 and 14 of the VA Tutorial.

**Modeling assignment:**
consider the following description of Nandini’s information system and complete the assignment found below.

Only five database entities currently exist in the enterprise. These entities are: Customer, Supplier, Inventory, Transaction, and Price. Among these, the Price entity is actually an associative entity between Supplier and Inventory. It was created to normalize the many-to-many relationship between Supplier and Inventory entities. Since one supplier can supply many inventory items and an inventory item can be supplied by more than one supplier of Nandini, a many-to-many relationship exists between supplier and inventory entities. These relationships are difficult to implement and should be decomposed into one-to-many relationships by introducing associative entities.

The customers and suppliers of Nandini are identified by account numbers, and the transaction database contains these number as a foreign key to establish a connection between the transaction database and the supplier and customer databases. As usual in business organizations, customers and suppliers can generate many transactions but each transaction is unique to a customer or a supplier.

The purchasing process of the inventory management function accesses the supplier data store to verify supplier information before sending orders, and update information after receiving shipments. The price data store is also frequently used by the inventory management function - both processes. Prices of various items are obtained from the price data store by the purchasing process to prepare supplier orders. On the other hand, information in the price data store is modified by the inventory reporting process. The order verification process of the customer order processing function uses the customer data store to verify customer information.

The following is a listing of some important data items in these data-stores:

**(i) Customer data-store:**
Customer account number (Primary key)
Customer name
Customer address
Credit limit

**(ii) Supplier data-store:**
Supplier account number (Primary key)
Supplier name
Supplier address

**(iii) Transaction data-store**
Transaction number (Primary key)
Customer account number (Foreign key)
Supplier account number (Foreign key)
Transaction date
(iv) **Inventory data-store:**
Item number (Primary key)
Item name
Unit price
Quantity on hand

(v) **Price data-store:**
Item number (one of the Primary key attributes; Foreign key)
Supplier account number (one of the Primary key attributes; Foreign key)
Supplier price

**Assignment**  
It is important to complete the following sections of the assignment in proper sequence

(a) Create an entity relationship diagram depicting the five entities of the Nandini’s information system domain. The entities should include all the attributes corresponding to the data store items as described above and include the complete specification of the primary and foreign keys. 
Run the Key Analysis function of the Repository and make sure you fix all key errors.

Print and submit a view of the diagram that includes all entities, their relationships, primary and foreign keys.

(b) Create a repository report from your entity relationship diagram, containing a detailed listing, including all entity types from your main entity relationship diagram showing all entry characteristics, sorted by entity type, with multiple entries per page. 
Submit a printed copy of this report.

(c) Update your data flow diagrams with the additional information provided to you.

(d) Set your ERD balancing rules (through the Options-ERD Balancing Rules menu) to specify that all fundamental elements must be used on a DFD, and every entity must correspond to a data store.

Run the Model Balancing function of the Repository. Print and submit the list of error messages reported.

(e) Update the definitions of the data stores by including all data items corresponding to entity attributes in the data store composition. Run the Model Balancing function of the Repository again. There should be no errors reported.

(f) Create a repository containing a detailed listing of all data stores, listed alphabetically. 
Submit a printed copy of this report.

This assignment is worth 70 points.