**Retrieve Data From a Database**

* Select all borrowers

SELECT \*

FROM Borrower

* Select all books borrowed by borrowers, order by borrow date

SELECT BookTitle

FROM Book

INNER JOIN Borrower

ON Book.BookID = Borrower.BookID

ORDER BY BorrowDate

* Select all books and include the author first and last name

SELECT BookTitle, AuthorFirstName, AuthorLastName

FROM Book

INNER JOIN Author

ON Book.AuthorID = Author.AuthorID

* Insert a new client with an occupation of pilot

INSERT INTO Client (Occupation)

VALUES (pilot)

**Abstract**

This essay was written to complete the assignment for the class from study.com computer science 107 Database Fundamentals. Provided was an example database and the goal was to identify the dependencies and characteristics of said database and then transform it into the needed third normal form (3NF) from either 1NF or 2NF. Due to the data tables lacking any type of data inputs for analysis, some assumptions will be made to fill in the unknown information.

**Identifying the Tables Given**

The table provided for this lession I will have placed at the bottom of the essay for the sake of design and document flow but to start I would like to looking into the first normal form and see if our database and tables meet the requirements for 1NF. So, according to Study.com’s insturctor Martin Gibbs the requirements are “All tables have a primary key. Fields have unique names. Data is not repeated across fileds and there’s no redundant data, like a field that is a combination of other fields.” Taking a peek at the provided tables we can clearly see that each of the tabels are already in 1NF. Animal products, Grains, Produce, and Purchases all have the field name “ITEMID” which is assumed to be a unique identifier for each individual item or purchase. Similarly, Supplier has the field SUPPLIERID which is also assumed to be a unique code.

Now that the tables are verified to be in 1NF we need to see if they are also in the second normal form and if not, talk about the steps we can take to get them there. So first, what do we need to look for? The requirments for a table to be in 2NF are “Already In 1NF. All partial dependencies on the primary key are removed.” Since we know that our tables are in 1NF all we really need to worry about is removing partial dependancies. According to byjus.com a partial dependency is described as occuring when one primary key determines some other attribute/attributes. So if the primary key is a certain value, is there anywhere else in that table that will be affected by that value. In this case we actually have quite a few partial dependencies. In the Grains table for example we have the field GRAINNAME. If we had for example the ITEMID (primary key) of 12, that grain may be oats which would then be filled into the GRAINNAME field. Since GRAINNAME is dependent on the primary key, we need to separate those entirely by removing GRAINNAME into a separate table using the ITEMID as its foreign key. We also have partial dependancies with ANPRDNAME, PLUCODE, PRODUCENAME and tho not completely apparent, possibly SPECIALTY in the Suppliers table. Since Purchases doesn’t have any partial dependencies, it is already in NF2.

The final step is to get our database up to the third normal form. The requirements for the 3NF are already being in 2NF and that it contains only columns or fields that do not have transitive dependence. Due to most of our tables not being in 2NF to start with, we cannot properly move them to 3NF until previous steps taken. Beyond that I could not specifically decifer any transitive dependancies due to the limited information of the tables.

Table

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**References**

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