**Blackboard**

Students should check blackboard every day for assignments and announcements.

Assignments will be posted as an announcement. The assignment can then be found under the assignments tab on blackboard.

The date for the final exam is Wednesday May 6 at 7:00pm - 9:00pm

**Relations**

The five conditions for a table to be a relation are:

* Cells of the table must be of single value (neither repeating groups or arrays are allowed as values)
* Each column has a **unique** name.
* The order of the columns in the table is insignificant.
* No two rows in the table may be identical.
* The order of the rows in the table is insignificant.

Databases can be searched based on attributes.

* Given the value of an attribute, you can look up values of other attributes.
* For example: If you know the name of a person, you can find their email address
* Different users have different abilities in regard to looking at or modifying data (Not all data is available to all users).

**Functional Dependency**

A **functional dependency** is a relationship between or among attributes.

Attribute **Y** is considered functionally dependant on attribute **X** if the value of **X** determines **Y**

When **X** determines **Y**, it means that the relationship of the values of **X**:**Y** is **N**:**1**

This means: **X** has only one respective **Y**, while **Y** can have many respective **X**’s (explained below)

Given a table with three attributes (LastName, Email, UserID)

Email 🡪 LastName (Email determines LastName / LastName is functionally dependent on Email)

UserID 🡪 LastName (UserID determines LastName / LastName is functionally dependent on UserID)

LastName 🡪 nothing (LastName doesn’t determine anything/nothing is functionally dependent on LastName)

Email:LastName has an N:1 relationship.

* Given any valid Email, there will be only one LastName associated with it.
* However, given any valid LastName, there may be multiple Emails
* There may be many people with the last name ‘Smith’ and therefore many Emails.

Attributes on the left side are called determinants. So in the above example, Email and UserID are determinants of LastName.

If **X**🡪(**Y** , **Z**), then **X**🡪**Y** and **X**🡪**Z**

However, if (**X**, **Y**)🡪**Z**, it is **NOT** true that **X**🡪**Z** and **Y**🡪**Z**

**Anomalies**

The following section is based on Figure 5,3 on page 124 in the book.

This table shown is a bad table because it has two kinds of anomalies.

**Deletion anomaly** – Data is lost upon deletion of an entry.

 If you delete student 100, you will lose information about the fee of Skiing.

**Insertion anomaly** – You can’t add data until you have data about another unrelated item.

 You cannot specify the fee of another Activity until a student enrolls for it.

In order to solve these problems and eliminate the anomalies, you have to disassociate the items: Break the data up into two tables (as shown in Figure 5,5).

* Data will not be lost if a Student is deleted.
* Activities may be added without having to have a Student enrolled.

**Normal Forms**

**First Normal Form** – Any table of data that meets the definition of a relation (See “The five conditions” at the start of notes).

**Second Normal Form** – All of a table’s nonkey attributes are dependent on all of the key.

**Third Normal Form** – Second normal form and the table has no transitive dependencies

**Transitive dependency** – in a relation where there are at least three elements that are as such: A🡪B, B🡪C, etc.