

# Lesson Plan 02, ISTA-420

## Chapter 2, T-SQL Fundamentals

May 31, 2017

### 1 Class Discussion

1. Give an informal definition of *database* as used in the expression “relational database management system.”
2. Give an informal definition of *database* as used in the expression “Human Resources database.”
3. Give an informal definition of *entity integrity*.
4. Give an informal definition of *referential integrity*.
5. What is a *relation* as defined in the textbook? A one word answer to this question is sufficient.
6. Is this table in first normal form? Why or why not? If it is not, how would you change it?

```
create table faculty (  
    facID int primary key,  
    facName text,  
    facCreds text);
```

facID	facName	facCreds
1	Alan Alda	BA, MA
2	Bridgette Bardot	BS, MS, PhD
3	Casey Cason	AA, BBA, MBA, DEd

7. Is this table in second normal form? Why or why not? If it is not, how would you change it?

```
create table pets (  
    ownerID int primary key,  
    petID int primary key,  
    ownerName text,  
    petName text,  
    petType text);
```

ownerID	petID	ownerName	petName	petType
1	1	Dom Delouise	Rex	German Shepherd
1	2	Dom Delouise	Lacy	Collie
2	1	Emilio Estevez	Midnight	Persian Cat

8. Is this table in third normal form? Why or why not? If it is not, how would you change it?

```
create table friends (
    friendID int primary key,
    friendName text,
    friendStreet text,
    friendCity text,
    friendState text,
    friendZip text);
```

friendID	friendName	friendStreet	friendCity	friendState	friendZip
1	Fred Flintstone	123 Rock Quarry Rd	Bedrock	GA	31905
2	Greta Garbo	456 Starlit Ave	Paris	FL	30019
3	Harry Houdini	789 Hidden Glen Lane	Alcatraz	CA	00000

9. What is an *OLTP database*? What operations is it optimized for?
10. What is a *star schema*? What operations is it optimized for?

## 2 In Class Exercises

### 2.1 Installing TSQLV4

We will download and install the database the text book uses. We will do this on the machine that you installed SQL Server and SSMS on. You will be using this for the homework.

### 2.2 Class Exercises

Using SQLite and the Northwind database, write a SQL script that executes the following queries. Your deliverables should be your SQL script and the text output.

1. What are the regions?
2. What are the cities?
3. What are the cities in the Southern region?
4. How do you run this query with the fully qualified column name?
5. How do you run this query with a table alias?
6. What is the contact name, telephone number, and city for each customer?
7. What are the products currently out of stock?
8. What are the ten products currently in stock with the least amount on hand?
9. What are the five most expensive products in stock?
10. How many products does Northwind have? How many customers? How many suppliers?

## 3 Graded Labs

Lab 1, exercises 1, 2, and 3, from 20761A, page 1-16. Labs will be directed by assigned students.

## 4 Course Project

### 4.1 Software Process

Requirements analysis, functional requirements, nonfunctional requirements. UML and use cases.

## 4.2 Version Control

Initializing a local Git repository.

## 4.3 Project Assignment

Writing a formal requirements specification for the project. This should include examples of the data that is important to the project and at least one query.

# 5 Homework

## 5.1 Readings

Read chapter 2 of the textbook T-SQL Fundamentals, pages 27 through 59.

## 5.2 Exercises

1. Review the documentation and tutorials on the following web sites.
  - Microsoft documentation, <https://docs.microsoft.com/en-us/sql/t-sql/queries/queries>
  - General SQL documentation, <https://sqlite.org/syntaxdiagrams.html>
  - SQL tutorial, <https://www.w3schools.com/sql/default.asp>
  - SQL tutorial, [https://www.tutorialspoint.com/t\\_sql/index.htm](https://www.tutorialspoint.com/t_sql/index.htm)
2. Do exercises 1 through 5 beginning on page 93. You are allowed to look at and copy the solutions, but make sure you understand the concepts. For example, if you give a query similar to exercise 1 but for another month, would you understand how to do it?