Component 4: Introduction to Information and Computer Science

Unit 6:

Databases and SQL

Lecture 5

Topic V: Define the Basic Data Operations for Databases and How to Implement them in SQL

- SQL Standards
- Create the Database
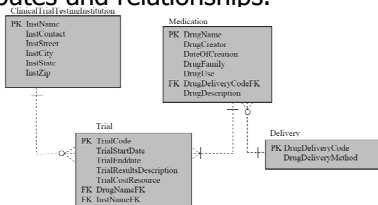- Create Tables
- Create Relationships

Implementation of a Relational Database Data Model

- Use a small four-table database to show the creation of a database with its tables, attributes and relationships.

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SQL Standards

- Every DBMS is supposed to support standard SQL as defined by ANSI and ISO.
- Basic SQL statements vary only slightly from one DBMS to another
- Many of the more sophisticated DBMSs like SQL Server and Oracle differ once you get beyond basic SQL statements
- We will look at some basic SQL statements

SQL to Create the Database

- This SQL example is for SQL Server, but something similar would be used with other DBMSs

```
CREATE DATABASE DrugTrials
ON
(Name=DrugTrials.dat,
 FILENAME='C:\componenet4\DrugTrials.mdf');
```

- Other parameters could be specified, but this takes advantage of default values

SQL to Create a Table

```
CREATE TABLE ClinicalTrialTestingInstitution
(
  InstName  VARCHAR(15) NOT NULL,
  InstContact     INT         NOT NULL,
  InstStreet      VARCHAR(15) NULL,
  InstCity  VARCHAR(12) NULL,
  InstState VARCHAR(2)  NULL,
  InstZip   VARCHAR(9)  NULL,
  CONSTRAINT InstNamePK PRIMARY KEY(InstName)
);
```

SQL to Create a Second Table

```
CREATE TABLE Trial
(
  TrialCode              int        NOT NULL,
  TrialStartDate         datetime   NOT NULL,
  TrialEndDate           datetime   NULL,
  TrialResultsDescription  varchar(100)  NULL,
  TrialCostResource      varchar(20) NULL,
  DrugNameFK             varchar(20) NOT NULL,
  InstNameFK             varchar(15) NOT NULL,
  CONSTRAINT TrialCodePK PRIMARY KEY(TrialCode)
);
```

Creating a Relationship

To complete the relationship between two tables the DBMS must be informed about the primary to foreign key connection.

```
ALTER TABLE Trial
  ADD CONSTRAINT CInstNameFK
  FOREIGN KEY(InstNameFK)
  REFERENCES
    ClinicalTrialTestingInstitution(InstName)
  ON UPDATE CASCADE;
```