

REVIEW LESSON

MTA Course: Database Administration Fundamentals

Lesson name: Database Fundamentals 4.1

Topic: Understand normalization (One 50-minute class period)

File name: DBAdminFund_RL_4.1

Lesson Objective:

4.1: Understand normalization. *This objective may include but is not limited to:* understanding the reasons for normalization, the five most common levels of normalization, how to normalize a database to third normal form.

Preparation Details

Prerequisite student experiences and knowledge

An understanding of normalizing database objects is required for this review. The primary focus of this review will be on the applied use of Normal Forms. This MTA Certification Exam Review lesson is written for students who have learned about database administration. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the Microsoft® resources and Web links at the end of this review lesson.

Instructor preparation activities

None

Resources, software, and additional files needed for this lesson:

- Microsoft PowerPoint® viewer and projector
- DBAdminFund_PPT_4.1

Teaching Guide

Essential vocabulary:

normalization—applying a body of techniques to a relational database to minimize the inclusion of duplicate information.

Normal Form—structuring (organizing) information in relational databases to ensure that the database is suitable for querying and free of certain undesirable characteristics—insertion, update, and deletion anomalies that could lead to loss of data integrity. Normalization also promotes efficient maintenance, storage, and updating.

1NF—First Normal Form (1NF) sets a few basic rules for a database: eliminate duplicative columns from the same table, create separate tables for each group of related data, and identify each row with a unique column (the primary key).

2NF—Second Normal Form (2NF) = 1NF Plus: Remove subsets of data that apply to multiple rows of a table and place them in separate tables. Create relationships between these new tables and their predecessors through the use of foreign keys.

3NF—Third Normal Form (3NF) = 2NF Plus: Remove columns that are not dependent upon the primary key.

4NF—Fourth Normal Form (4NF) = 3NF Plus: It has no multivalued dependencies. This form is mostly academic and rarely used.

5NF—Fifth Normal Form (5NF) = 4NF Plus: Fifth Normal Form states that no nontrivial join dependencies exist. This form is mostly academic and rarely used.

Lesson Sequence

Activating prior knowledge/lesson staging (5 minutes)

1. *Say:* During today's review, we will look at the reasons for normalization, the three most common levels of normalization (plus the two additional forms that are not commonly used), and how to normalize a database, with focus on the Third Normal Form.

Lesson activity (35 minutes)

1. Present the DBAdminFund_PPT_4.1 PowerPoint slideshow.

Assessment/lesson reflection (10 minutes)

1. There are three questions for the class on the last slide of the presentation. This provides the opportunity for a class discussion of the lesson or a formal assessment with a written quiz. The use of small student whiteboards works very well here as a lesson reflection tool.

Microsoft resources and Web links

Faculty Connection Academic Resource Center

(<http://www.microsoft.com/education/facultyconnection/ARC/ResourceCenter.aspx?c1=en-us&c2=0>)