Relational Database Design

Course Summary

Description

This course is designed to provide the student with an introduction to relational database design concepts. Students will learn methodologies such as entity relationship modeling and normalization techniques that will allow them to create a logical database design with business rules and performance in mind. The course focuses on different levels of data integrity, including referential integrity considerations between entities. The lab session allows the students to practice designing a logical data model.

Objectives
At the end of this course, students will be able to:

- Understand the concept of relational databases
- Illustrate the application analysis and design process
- Identify database design and performance considerations during the design process
- Implement the normalization process used with relational databases
- Understand implementation of referential integrity including proper delete rule selection
- Understand and perform the steps involved to create data models utilizing the entity/relationship modeling and normalization approaches

Topics

- Basic Structured Analysis Concepts
- Entity Relationship Modeling
- Data Normalization
- Referential Integrity
- Logical and Physical System Models

Audience

This course is designed for systems analysts and programmers who are responsible for analyzing business areas, designing and creating relational databases.

Prerequisites

There are no prerequisites required for this course.

Duration

One day

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Course Outline

I. Entity Relationship Modeling
- A. Introduction to Database Design
- B. Defining the Mission
- C. Entity Relationships – Modeling and Diagrams
- D. Entity Relationship Diagrams - Notational Conventions
- E. Association Entities
  - 1. Drawings Guidelines
    - a. EXERCISE - Entity Relationship Diagrams
- F. Data Elements and Primary Keys
  - 1. EXERCISE – Assign Data Elements and Primary Keys

II. Normalization
- A. Introduction to Normalization
- B. First Cut
- C. Overview of Normal Forms
- D. First Normal Form (1NF)
- E. Second Normal Form (2NF)
- F. Third Normal Form (3NF)
- G. Derived Columns
- H. Logical Design Evaluation
- I. Benefits of Normalization
- J. Denormalization
- K. Referential Integrity
  - 1. DELETE Concepts
  - 2. INSERT and UPDATE Implications
  - 3. Summary
- L. Transition From Logical to Physical
  - 1. EXERCISE - Normalization