IT 775
Database Technology

Data Stores

Objectives and Outcomes

You Should be able to...

1. Explain the principles and characteristics of good relational database design.

2. Design entity relationship models for a business problem domain verified by the rules of normalization (through third normalized form).

3. Build simple to moderately complex data models that solve business problems.

4. Compare and contrast the data definition language (DDL), data manipulation language (DML) and data control language (DCL) components of Structured Query Language (SQL).

5. Write simple to moderately complex SQL queries in a multiple table environment.

You Should be able to...

6. Write SQL to create tables and indexes, insert rows, delete rows, update rows, drop tables and indexes and alter the database.

7. Understand the concept of database transactions and demonstrate the proper use of commits and rollbacks.

8. Create and use SQL scripts.

9. Show an awareness of contemporary issues in database design and development.

10. Install, configure, manage and maintain a database system.

You Should be able to...

Students in this course will become information technologists with the knowledge and skill to see information data problems, apply those problems to the processes and structures that databases address, and create databases that will address those problems.

Objectives

1. Use and apply information systems solutions

   a. Recognize the significant role data and databases play in information systems.
   b. Employ principles in developing a database solution for a business problem.
   c. Describe varying data, information, and knowledge needs for these systems.
   e. Explain how a database can support a business operation or function.
   f. Know the scope, complexity, and implications of data, information, and knowledge management for an enterprise solution.

Objectives

2. Understand and apply high-level tools and emerging technologies

   a. Apply appropriate personal and/or workgroup database software to a specified business problem.

   b. Develop various models using Computer Aided Software Engineering (CASE) technology or other modeling software for database design.

   c. Demonstrate an understanding of the hardware, software, communications, and network fundamentals.

Objectives

3. Use and apply systems theory and concepts

a. Construct Class or Entity Relationship Attribute models for 3rd Normal form database based upon Context Model.
b. Apply concepts from conceptual to logical to physical implementations of data for a business function.
c. Test and verify that the solution (application and database) provided meets the business requirements.
d. Evaluate and demonstrate appropriate integration of the life cycle of data in terms of the Systems Development Life Cycle, its process, and database application.

Objectives

4. Demonstrate independent critical thinking and problem-solving skills.

a. Identify the characteristics or properties of data and data structures which impact database design.
b. Apply database design techniques and confirmation mechanisms (such as normalization) to business data problems.
c. Recognize the need for applying system development life cycle to create well-structured information systems.
d. Analyze and design a Class or ERD that provides an information system that meets the business requirements.
e. Apply problem-solving approaches to identify data entities, processes, and interfaces to be implemented as application components.

Objectives

5. Understand and apply system development methodologies.

a. Develop fully attributed logical and physical data models.
b. Model business rules for a database using the following constructs: Sentences describing relationships, Classes or Entities, Attributes, Domains, Relationships (with cardinality), Design and develop logical model, Design and develop physical model, Generate the DDL.
c. Understand (at a high level) the data definition language (DDL) generated by a physical database design.
d. Apply normalization rules to the Third Normal form.
e. Understand data manipulation language (DML) for altering, querying, and deleting within a database.
f. Use class or entity-relationship tools and techniques to analyze and design a database.

Objectives

6. Communicate effectively with customers, supervisors and peers, both orally and in writing

a. Demonstrate an ability to create and present written or oral reports.

b. Schedule and organize team meetings to monitor progress of project development.

c. Understand the dynamics and tools of organizing teams and holding group meetings.

d. Develop project documentation, including application and database design.

Objectives

7. Understand the expectations of an Information Technology professional.

a. Explain the good and bad ways that technology has and can change organizations and society.

b. Demonstrate an understanding of best practices in conceptual/logical/physical data modeling, data storage, and data retrieval.

c. Understand ethical issues involved in the use of information systems and the complexity of the issues.

d. Practice adherence to standards of academic honesty.

General knowledge of this are will help your career!

Datastore technology has rapidly become a key skill in every facet of technology-using environments. Knowing all that you can about the methods and tools in designing, building and maintaining good datastores will make you a better, more valued member of an information technology team.

Keywords for Job Hunting and Career Development

- Data Modeling
- Business Rules
- Relational Database
- Entity Relationship Diagram (ERD)
- Database development process
- Database Design / Normalization
- Structured Query Language
- Business Intelligence (BI)
- Database Administration (DBA)
- Data Warehousing (Data Marts)
- Data Lakes (Data Swamps)
- Data/DB Access/Abstraction Layer (DAL & DBAL)