

Component 4: Introduction to Information and Computer Science

Unit 6: Databases and SQL Lecture 3

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Topic III Structured Query Language

- Background information
- What can SQL do?
- How is SQL executed?
- SQL statement characteristics
- What does SQL produce?

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Structured Query Language

- Created at IBM (San Jose, CA, late 1970s)
- Pronounced "sequel" or by the letters S, Q, L
- Considered a fourth generation language
- Called a **data sublanguage** because it is used to access and maintain a database
- Is used with all DBMS products

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SQL Continued

- American National Standards Institute (ANSI) created a standard for SQL
- International Standards Organization (ISO) is another SQL standards organization
- All vendors must support the standard, but many have added to the standard

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What Can SQL Do?

- Modify a database's structure
- Change system security settings
- Manage user permissions
- Query a database for information
- Update the contents of a database
- Backup/recovery of a database
- Create the database, database tables, fields and indexes

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What Can SQL Do (Continued)?

- Execute intrinsic functions
- Programming logic constructs of sequence, alternation and iteration are allowed in some vendor versions of SQL
- Security locking
- Implement stored procedures, views and triggers

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How is SQL Executed?

- SQL can be embedded and constructed within application code
- SQL procedures can be invoked by application code and by other SQL statements
- Can be executed outside of an application program in its own environment

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SQL Statement Characteristics

- SQL statements are not case sensitive however many institutions impose a case standard
- Data in the database can be case sensitive or not.
- Punctuation is important in SQL. The DBMS depends on punctuation in its interpretation of the SQL statement.

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More SQL Characteristics

- Subqueries are nested SQL statements
 - Output of the subquery is input to the other SQL statement
- SQL statements can join tables of the database together



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What does SQL produce?

- The output from an SQL statement can be anything from nothing to many rows of data (**record sets**)
- Limit the output of an SQL statement by providing criteria that the data must meet.
