Component 4: Introduction to Information and Computer Science

Unit 6: Databases and SQL
Lecture 3

This material was developed by Oregon Health & Science University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number IU24OC000015.

Topic III Structured Query Language

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

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
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

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

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
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

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.

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
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.