SQL
Structured Query Language
History of SQL

• Developed by IBM
  – 1970 E.F. Codd publishes Definition of Relational Model
  – 1975 Initial version of SQL Implemented (D. Chamberlin).
    • First called SEQUEL but Official pronunciation of SQL is ESS QUE ELL
    • Official Oracle pronunciation is SEA QUELL
  – IBM experimental version: System R (1977) w/revised SQL
  – IBM commercial versions: SQL/DS and DB2 (early 1980s)
Spread of SQL

- Oracle introduces commercial version before IBM's SQL/DS
- Other players enter:
  - INGRES 1981 & 85
  - ShareBase 1982 & 86
  - Data General (1984)
  - Sybase (1986)
  - by 1992 over 100 SQL products
Early SQL Standards

• 1986/87 IBM SQL becomes standard
  – ANSI and ISO
    • American National Standards Institute
      International Standards Organization
  – Commonly called SQL-86
1989: Standard Upgraded (SQL-89)

- Integrity Enhancement
  • Declaration of Primary Keys Foreign Keys, etc.
- Embedded SQL Standard
  • Initial SQL was intended to be an Interactive Environment. But standards focus on embedded SQL.
- Other Standards for SQL
  • X/OPEN (Unix Vendors)
  • SAA (IBM)
  • FIPS (US Government)
1992 SQL Standard

• 1992 New ANSI/ISO Standard: SQL2 or SQL/92
• Expansion of SQL/89
  – Relational Algebra additions INTERSECT, EXCEPT, JOIN
  – Domains
  – More powerful constraints
  – Dates and Times
• Standard is a wish-list
  – Levels of Compliance
  – Guidance for future development
Levels of Compliance: SQL92

- Entry, Intermediate, Full
- Oracle7 was Entry-Level Compliance
- Textbook was/is in Full Compliance
- Result: Many things in textbook would Not Work in Oracle
- Also: Many Features of Oracle were Not in Textbook
- Made programming assignments INTERESTING
SQL 1999

- New Standard: Widespread Partial Compliance
- No Standards Compliance Testing and Certification
- Widespread Proprietary Extensions
- Portability of applications in doubt
- Developers must consult vendor-specific references.
SQL 1999 Features

• Regular Expressions
• Recursive queries
• Procedural statements
• Triggers
Later Standards

• SQL 2003
  – Some XML features
  – Window functions
  – Auto generation
• SQL 2006
  – Lots of XML
• SQL 2008
  – Instead Of triggers
• SQL 2011
  – Time periods
  – Versioning (as of date)