Databases

On collection of data stored in an organized electronic format organized by records(row) & fields(columns)

SQL (Structured Query Language) is the standard language for relational DB systems

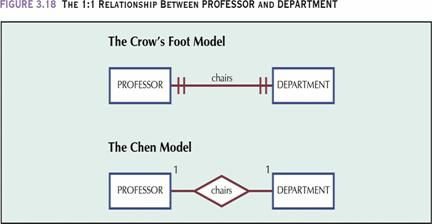
All relational management systems (Oracle SQL MySql, etc.) use SQL.

Some have their own dialects → like Oracle’s PL/SQL

ERD = Entity Relationship Diagram

Data modeling technique

Two main types: Crow’s Foot & Chen’s Notation



Sublanguages of SQL

DCL – Data Control Language

GRANT, REVOKE

DDL – Data Definition Language

ALTER, CREATE, DROP, TRUNCATE

DML – Data Manipulation Language (CRUD)

INSERT, SELECT, UPDATE, DELETE

TCL – Transaction Control Language

COMMIT , SAVEPOINT, ROLLBACK, SET TRANSACTION

DQL – Data Query Language

SELECT

Oracle SQL Constraints

Primary Key – Column or set of columns which uniquely identify each row in a table

Foreign Key – column referencing the PK in another table

Establishes a relationship between 2 columns in the same or different tables

Not Null – Values can’t be null

Unique – Every row in Unique calls

Check – Defines a business rule that every row in the column must follow

Default – Gives a default value to every row in column

What is Normalization?

* Normalization is the process of organizing columns (attributes) and tables (relations) of a relational database to reduce DATA REDUNDANCY and IMPROVE DATA INTEGRITY.
* Only store info directly related to the table
* Each table should have a unique identifier
* There are 7 levels of NORMAL FORM, but we usually aim to be at at least 3rd normal form or 3NF

Sequence

* A sequence is a user defined schema bound object that generates a sequence of numeric values according to the spec. with which the sequence was created.
* CREATE SEQUENCE (can’t replace)

Other PL/SQL Blocks

* Cursor a temporary work area created in the system memory when a sql statement is executed. Cursor contains info on a select statement and the rows of data acceessed by it.
* Triggers

Normal Forms

Functions

* A functon is a named PL/SQL Block which is similar to a procedure. The major difference between a procedure and a function is, a function must always return a value, but a rpocedure may or may not return a value
* CREATE OR ERPLACE FUNCTION FUNCNAME PARAMS
* RETURN RETURNDATATYPE IS
* DECLARATION SECTION
* BEGIN
* EXECUTIONSECTION
* RETURN
* END

Stored Procedures

* A stored procedure is a named PL/SQL block which performs one or more specific task. This is similar to a procedure in other programming languages.
* Can pass parameters to procedures in two ways.
* IN parameters: parameters taken as arguments
* OUT parameters: parameters giving values back
* Atomic Database
* when data is atomic, broken into small pieces of data that can’t or shouldn’t be divided
* tables with atomic data can’t have multiple columns with the same type of data (dont be redundant
* column with atomic data can’t have several values of the same type of data in the column (don’t have full name in column, have firstname lastname)

1NF First normal form

* each row must contain atomic values
* Each row must have unique identifier or primary key

2NF

* non key field should be dependent on entire primary key (no partial dependencies)
* ex) purchase location depends on storeID but not customerID: separate into 2 tables:  
  CustomerID | StoreID, StoreID | PurchaseLocation
* dependent = 1:1 relationship
* only applies when we have composite keys
* must satisfy 1NF
* A table that’s in 1st normal form and only has a single column as the primary key (no composite key) is automatically in 2NF

3NF