Where We Are

- Now you know about:
  - What Database Management Systems are.
  - What Entity Relationship Models are.
  - Represent the Entity Relationship models using Entity Relationship Diagrams by Crow's Foot Notation.
- Entity Relationship Models are conceptual models.
- We need to convert ERDs to Relational Models so we are able to implement them as physical Databases.

Learning Objectives

- Finishing this module, you will be able to:
  - Understand and explain what are Relational Models
  - Explain the properties of Relational Models
  - Explain and select appropriate keys for Relational Models
  - Represent Relational Models with a set of Relational Schemas
  - Convert ERADs to Relational Models.

Relational Models

- Why are Relational Models?
  - Relational Model organizes data in two-dimensional tables: columns and rows.
  - Relational Model includes: Relations, Tuples, Attributes, keys and foreign keys.
  - Relational Models are represented by a set of Relational Schemas.

Relation Examples

Stores

StoreID	Street	City	Zip
#1506	1200 W Dillon Rd	Louisville	80027
#1546	1600 29th Street	Boulder	80301
#1524	1271 Sheridan Blvd	Broomfield	80020
#1517	7125 W 88th Ave	Westminster	80021
#1548	16420 Washington Street	Thornton	80023
#1503	10003 Grant Street	Thornton	80229
#1502	5215 Wadsworth Blvd	Arvada	8002

Cardinality

Degree

Relation Examples

Employees

EmpID	FirstName	LastName	DoB	Position	Departme	StoreID
#20399	John	Ford	1998/2/12	Manager	HR	#1506
#30123	Anne	Brand	2001/3/12	Intern	Marketing	#1546
#12524	David	Biden	2000/2/20	Assistant	Sales	#1524
#14517	William	Potter	2001/9/12	Senior Manager	HR	#1506
#15214	Mary	Alexander	2001/9/12	Assistant	IT	#1524
#11032	Rose	Smith	1999/1/21	Intern	IT	#1503
#02012	Julie	Smith	1977/12/1	Senior Manager	IT	#1503
#78123	Angela	White	1967/4/4	Senior Manager	HR	#1546
#21342	John	Ford	1983/11/11	Manager	IT	#1546

Cardinality

Degree

Terminologies

- A relation is a table with columns and rows.
  - Attribute is a named column of a relation.
  - Domain is the set of allowable values for one or more attributes.
  - Tuple is a row of a relation.
  - Degree is the number of attributes in a relation.
  - Cardinality is the number of tuples in a relation.
- Relational Database is a collection of normalized relations with distinct relation names.