Logols Learning

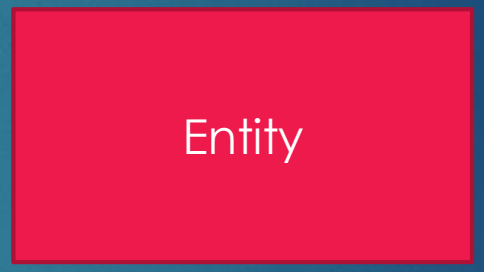
WEEKEND WEB DEVELOPMENT BOOT CAMP

TRAINING: DATA MODELING

Entities

- Types of data
  - Exist physically or logically
  - Think of nouns
- Physical Ex.
  - Customer
  - Employee
- Logical Ex.
  - Transaction
  - Bill of Materials

- Shape: Rectangle



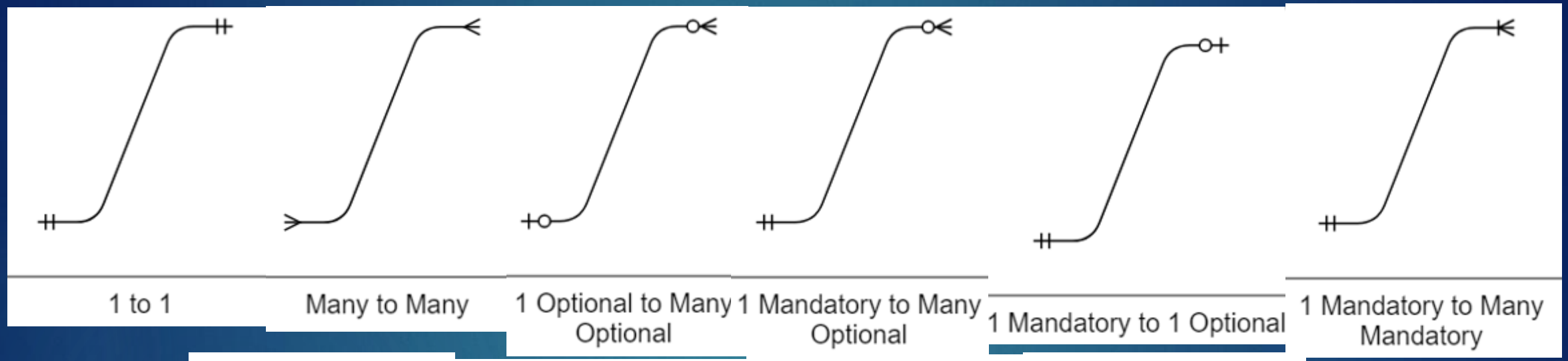
Attributes

- Fields within an Entity
- Ex. A Person Entity has the following attributes:
  - Name
  - Phone Number
  - Address
  - Social Security Number
- Shape: Oval

Relationships

- Which entities are related
- Think of verbs
- How entities are related - Cardinality
  - One to One
  - One to Many
  - Many to Many
- Shape: Line
  - Has different notations at the ends of the lines
    - Describe how entities are related

Crowfoot Notation

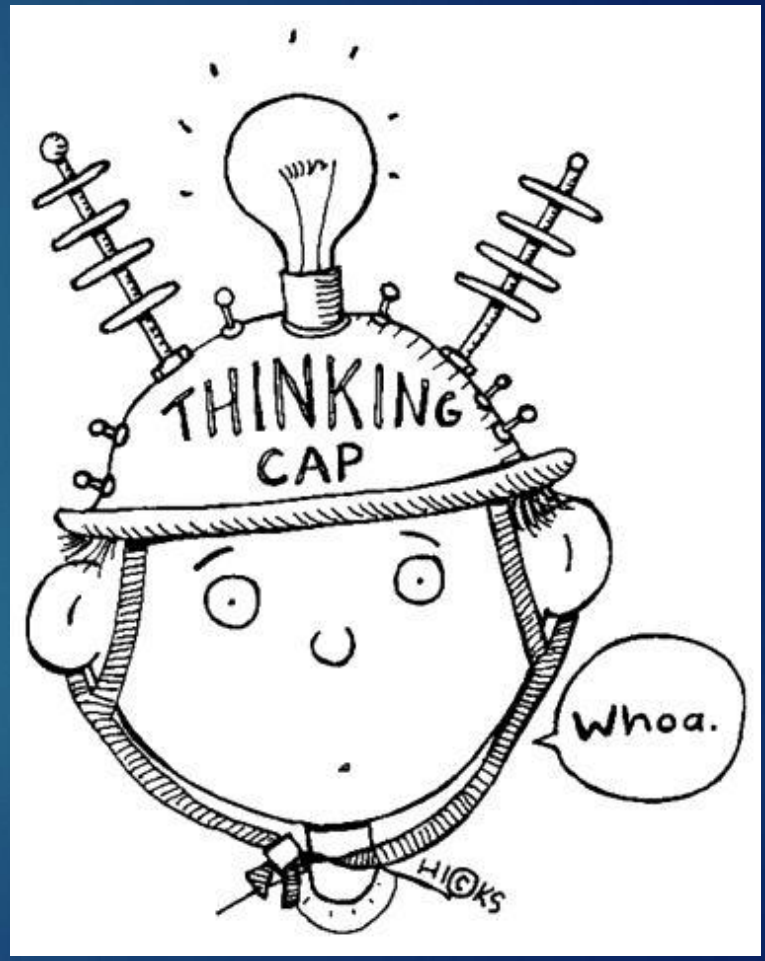


EXAMPLE

ENTITIES & RELATIONSHIPS

ASSESSMENT

ENTITIES & RELATIONSHIPS



TEAM PROJECT

ENTITIES AND RELATIONSHIPS

Normalization

- Unbundles overlapping entities
- Data Integrity
  - Minimize Duplication of data
- Referential Integrity
  - Make a change only in one place
- Keyed Data Access
  - Access and manipulate data quickly
- Avoid Anomalies
  - Insert, Update, Delete

First Normal Form

- Ensure Data is Atomic
  - Having no repeating groups (array of the same value)
- Attribute cannot hold multiple values.
- Define a primary or candidate key

EXAMPLE

FIRST NORMAL FORM

Second Normal Form

- Table is in 1NF
- No non-prime attribute is dependent on the proper subset of any candidate key of table.
- An attribute that is not part of any candidate key is known as a non-prime attribute
- In other words remove functional dependencies

EXAMPLE

SECOND NORMAL FORM

Third Normal Form

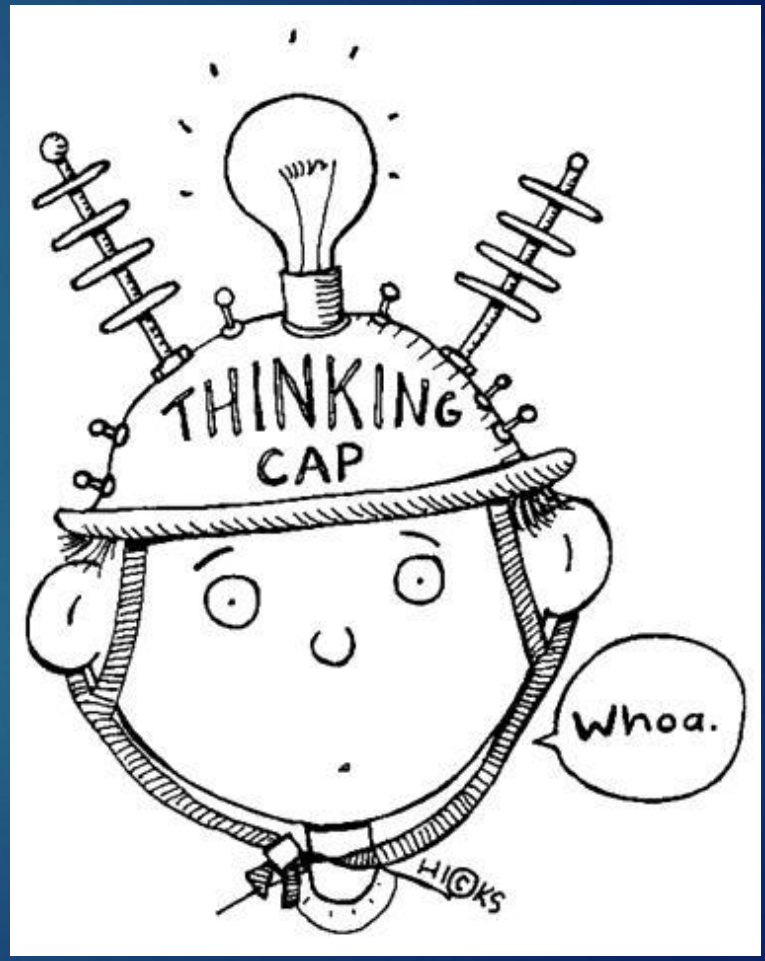
- Table is in 2NF
- Transitive functional dependency of non-prime attribute on any super key should be removed.
- A transitive dependency is a dependency between two nonkey attributes

EXAMPLE

THIRD NORMAL FORM

ASSESSMENT

NORMALIZATION



TEAM PROJECT

NORMALIZATION

Relational Database Terminology

- Table - Relation
  - Column – Relation Header Attribute
  - Row– Relation Body
- Constraint – Predicate on a column
- Primary Key – Uniquely Defines the table
- Foreign Key – Relates to another table
- Index – Provides quicker data access on one or a set of columns
- SQL – Structured Query Language – Query

Primary Keys

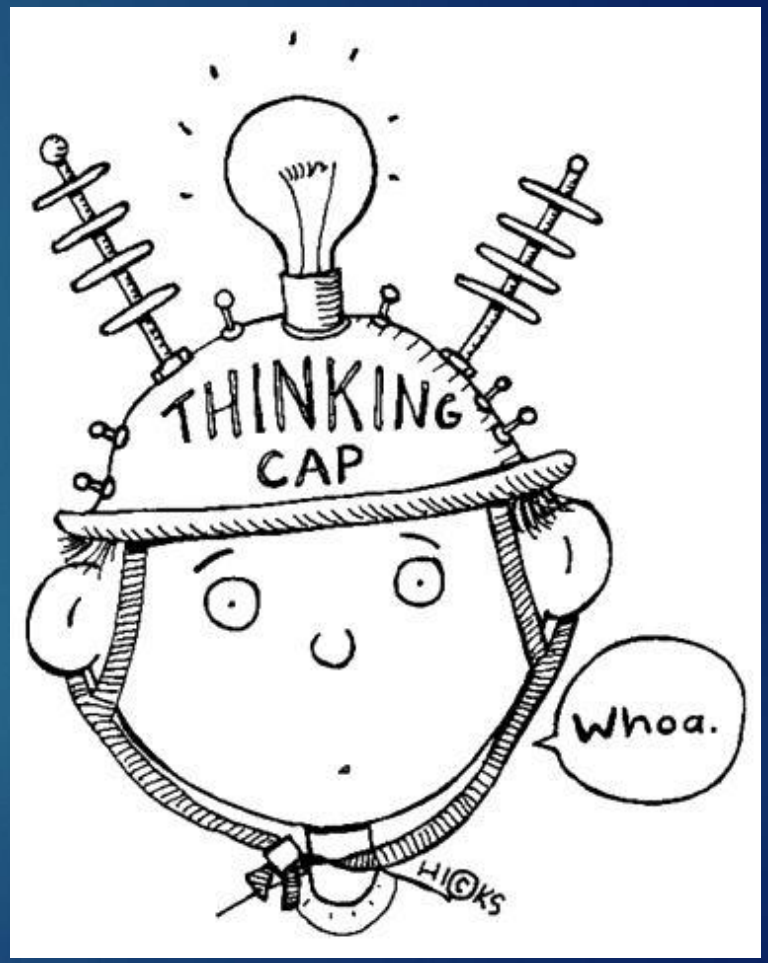
- Primary Key
  - Uniquely defines a record in a table
  - Types:
    - Composite
    - Surrogate
- Foreign Key
  - Columns that uniquely relate to another table

EXAMPLE

PHYSICAL DATA MODEL

ASSESSMENT

PHYSICAL DATA MODEL



TEAM PROJECT

PHYSICAL DATA MODEL

QUICK REVIEW

DATA MODELING

Not really a sign you'd want to see whilst driving through an eerily quiet neighbourhood...

Additional Resources

- Data Modeling 101
  - http://www.agiledata.org/essays/dataModeling101.html
- Normalization Videos:
  - https://www.youtube.com/watch?v=NScuEk7CSNo
  - https://www.youtube.com/watch?v=0suZ8H_bDgY&t=487s