

INFO 610 Fall 2020

Week 2.0

Terminology - Chapter 3

Value Related Terms

- Data - The values you store in your database.

12	33	899	699	23	Sept 1, 2020
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- Information - Data that you process in a manner that makes it meaningful and useful to you

Another hint

Samsung	UN65TU7000FXZA	899	699	23	Sept 1, 2020
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Information

Manufacturer	Model	MSRP	Price	Sold	Date
Samsung	UN65TU7000FXZA	899	699	23	Sept 1, 2020

Samsung
Samsung - 65" Class - 7 Series - 4K UHD TV - Smart - LED - with HDR
Model: UN65TU7000FXZA SKU: 6401722

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UHD 7 Series 

Screen Size Class: [①](#)
65" 

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Data is what you store, information is what you retrieve

Null

A *null* represents a missing or unknown value.

Null does NOT represent ZERO

Null does NOT represent an empty string.

Great example from the book:

QUESTION:

Imagine a table for EMPLOYEES. Two columns, 'hourly_wage' and 'annual_wage'. Where would we use NULL?

Problem with Nulls

Null values cause issues with 'math'

```
3 + null; -- null  
(25 * 3) + 4; -- null  
(null * 3) + 4; -- null  
(25 * 3) + null; -- null
```

Product ID	Product Description	Category	SRP	Qty On Hand	Total Value
7001	Shu-Lok U-Lock	Accessories	75.00		
7002	SpeedRite Cyclecomputer		65.00	20	1,300.00
7003	SteelHead Microshell Helmet	Accessories	36.00	33	1,118.00
7004	SureStop 133-MB Brakes	Components	23.50	16	376.00
7005	Diablo ATM Mountain Bike	Bikes	1,200.00		

- What do you think happens to get the average of the 'Qty On Hand'?

Structure Related Terms

- **Table** - In the relational model, data are stored in *relations*, which are perceived by the user as *tables*.
 - **Tuples** - Each row/record in a database is a *tuple*
 - **Attributes** - Each record has a set of values/properties stored as *attributes*.
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Table

	Attribute 1	Attribute 2	Attribute 3
Record 1	val 1	val2	val3
Record 2	val 4	val 5	val 6

Primary Key

- Tables are the chief structure in the database and each table always represents a single, specific *subject*
- The logical order of records and fields within a table is of absolutely no importance.
- Every table contains at least one 'field' - known as a primary key - that uniquely identifies each of its records.
- Data can exist independently of the way it is physically stored in the computer because of the last two characteristics.

Primary keys are typically an 'ID' in the database:

- ClientID, PatientID, etc

Field

- A *field* (known as an *attribute* in relational database theory) is the smallest structure in the database and it represents a characteristic of the subject of the table to which it belongs.
- Fields are the structures that actually store data.
- Every field in a *properly designed* database contains one and only one value and its name will identify the type of value it holds.

Types of fields

- Multipart - (composite field) - which contains two or more distinct items within its value
- Multivalued field - which contains multiples instances of the same type of value
- Calculated field - which contains a concatenated text value or the result of a mathematical expression

Record

- Record - aka tuple, in relational theory, represents a unique instance of the subject of a table.

Book example: Each record in the 'clients' table will represent a 'client' in real life. Each record in the table has a unique primary key 'ClientID'

View

- A *view* is a 'virtual' table composed of fields from one or more tables in the database
- Relational model refers to a view as being 'virtual' because it draws data from base tables rather than storing data on its own.

Three reasons views are important

- Simplifies working with data across multiple tables;
- Can be used to prevent certain users access to core tables
- Can be used to implement data integrity. Known as a 'validation view'

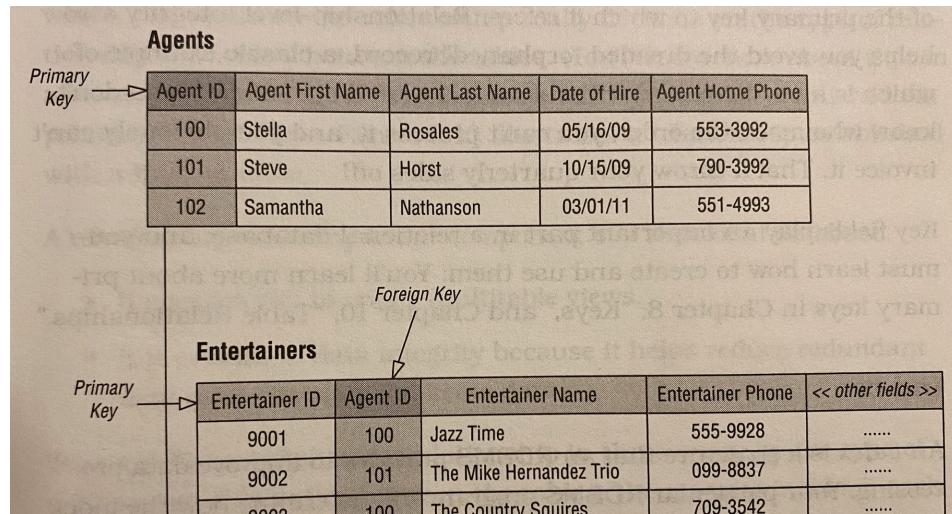
Students				
Student ID	Student First Name	Student Last Name	Student Phone	<< other fields >>
60001	Zachary	Erlich	553-3992
60002	Susan	Black	790-3992
60003	Joe	Rosales	551-4993

Student Instruments		
Student ID	Instrument ID	Checkout Date
60002	1003	02/02/12
60001	1002	02/06/12
60003	1000	02/06/12

Instrument ID	Instrument Description	Category	<< other fields >>
1000	Stratocaster	Guitar
1001	Player 2100 Multieffects	Multieffect Unit
1002	JCM 2000 Tube Super Lead	Amplifier
1003	Twin Reverb Reissue	Amplifier

Keys

- Primary Key - field or group of fields that uniquely identify each record within a table
 - Can be one or more fields
- Primary key *values* identify a specific record throughout the entire database
- Primary key *field* identifies a given table throughout the entire database
- Enforces table-level integrity and helps establish relationships with other tables in the database.



Index

- *Index* is a structure than an RDBMS provides to improve data processing.
- An index has NOTHING to do with the logical database structure!
- Not the same as a 'key'

Anyone get Docker working?

