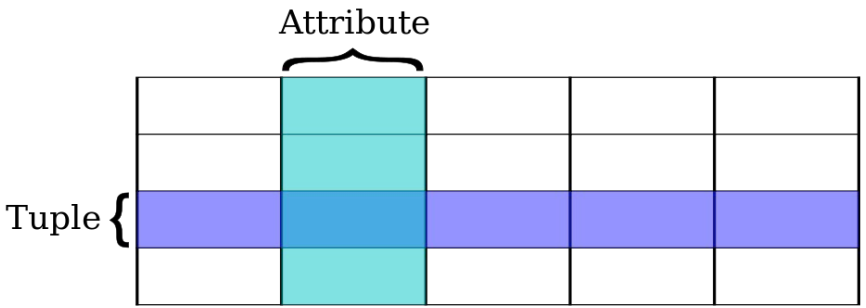
Databases and Normalization

Databases

Characteristics of a database table

- defines attributes of an entity
- each column heading has a unique name within that table
- each column is called an attribute
- each row is called a tuple
- each column (attribute) defines a characteristic of an entity
- each row (tuple) in a table defines that attribute of an entity



Instance of an entity

Title: The School for Good and Evil

Author: Soman Chianani

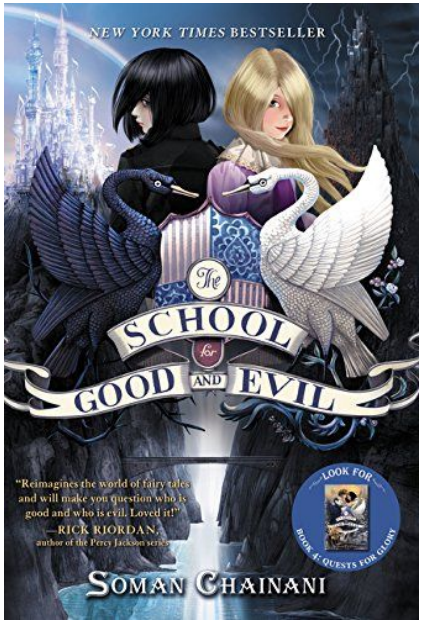
Format: Paperback

Pages: 544

Publication date: 2014

Publisher: HarperCollins

Language: English



Instance of an entity

Name: Talon the Blade's Shadow

Health: 583

Attack Damage: 60

Attack Speed: 0.625

Movement Speed: 335

Health Regen: 8.51

Armor: 26.88

Magic Resist: 32.1

More characteristics of a database table

- fields in a table contain a single piece of data
- each field in a column has the same type of data

Data types

Numeric

- tinyint *(256)*
- smallint *(65,536)*
- mediumint *(16,777,216)*
- int *(4,294,967,296)*
- bigint *(18,446,744,073,709,551,616)*
- float
- double
- decimal

Text

- char(n) (defined fixed width) *(8,000)*
- varchar(n) (defined variable width) *(8,000)*
- tinytext *(255)*
- text *(65,535)*
- mediumtext *(16,777,215)*
- longtext *(4,294,967,295)*
- enum

unsigned will not allow for negative numbers

Data types

Binary

- tinyblob
- smallblob
- blob
- mediumblob
- longblob

(case sensitive for text searches)
Binary Large OBject
storing binary data (.gif, .jpeg)

Date/Time

- date *(YYYY-MM-DD)*
- datetime *(YYYY-MM-DD HH:MI:SS)*
- timestamp
- time *(HH:MI:SS)*
- year *(YY or YYYY)*

Even more characteristics of a database table

- the order of the rows in unimportant
- the order of the columns is unimportant
- no two rows may be completely identical
- each row must have a unique identifier known as a primary key
- the primary key in one table may be a foreign key in one or more tables

Normalization

What is normalization?

Taking your data and putting it in a form/structure that is natural, eliminates error, and redundancy.

Normalization has several forms

- 1st Normalization Form - elimination of repeating groups of data through the creation of separate tables of related data
- 2nd Normalization Form - elimination of redundant data
- 3rd Normalization Form - elimination of all attributes from a table that are not directly dependent on the primary key

For Next Week:
What are attributes of a recipe?