

Database Basics

Boston MySQL User Group
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your database maestros

www.pythian.com

Overview

- ⇒ Why Use a Database?
- ⇒ ER Model
- ⇒ CREATE

Catalog 1,000 movies

- ⇒ Movie details
- ⇒ Starring actors
- ⇒ Plot synopsis
- ⇒ DVD extras

What do we care about?

Include

- Title
- Description
- Category
- Actors
- Release year
- Original Language
- Language
- Length
- Cost
- MPAA Rating
- DVD extras

Do Not Include

- My rating
- When bought
- Studio
- UPC code
- Format
- When viewed
- Who viewed with
- Wrote review?
- Which shelf
- Recommendations
- Related movies

Spreadsheet

Title	Category	Year Released	Lang	Orig Lang	Length	Cost	MPAA Rating	Special Features	Description	Actors
CLUB GRAFFITI	Animation	2006	English		65	12.99	PG-13	Trailers, Deleted Scenes	A Epic Tale of a Pioneer And a Hunter who must Escape a Girl in A U-Boat	TOM MCKELLEN, MORGAN WILLIAMS, LISA MONROE, DEBBIE AKROYD
DYING MAKER	Comedy	2006	English		168	28.99	PG	Behind the Scenes	A Intrepid Tale of a Boat And a Monkey who must Kill a Cat in California	GROUCHO SINATRA, MICHAEL BOLGER
FRISCO FORREST	Sci-Fi	2006	English		51	23.99	PG	Commentaries, Deleted Scenes, Behind the Scenes	A Beautiful Documentary of a Woman And a Pioneer who must Pursue a Mad Scientist in A Shark Tank	TOM MCKELLEN, ANGELA HUDSON, KIRSTEN AKROYD, GINA DEGENERES, DAN STREEP, LIZA BERGMAN, ALBERT NOLTE, RICHARD PENN, ROCK DUKAKIS
PIZZA JUMANJI	Games	2006	English		173	11.99	NC-17	Commentaries	A Epic Saga of a Cat And a Squirrel who must <u>Outgun</u> a Robot in A U-Boat	DARYL CRAWFORD, HARVEY HOPE, GENE MCKELLEN, HUMPHREY GARLAND, BELA WALKEN
TIMBERLAND SKY	Classics	2006	English		69	13.99	G	Commentaries	A Boring Display of a Man And a Dog who must Redeem a Girl in A U-Boat	GARY PHOENIX, JUDE CRUISE, BEN HARRIS, CHRISTOPHER WEST

What's wrong with this?



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Flat Files Are Not Optimal

- ⇒ Data redundancy, inconsistency
- ⇒ Accessing partial lists
- ⇒ Integrity constraints

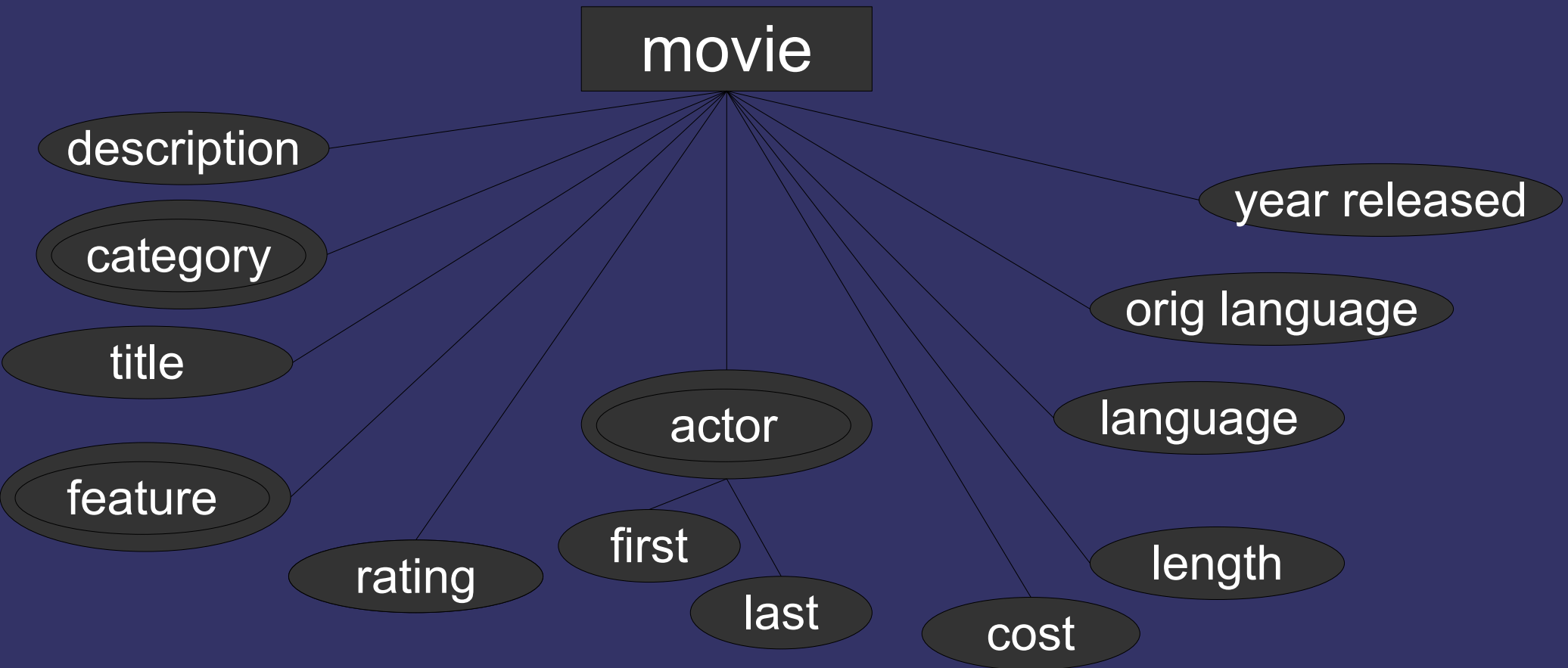
Flat Files Are Not Optimal (part 2)

- ⇒ Concurrent access
- ⇒ Security
- ⇒ Atomicity (with >1 file)

Entity-Relationship Model

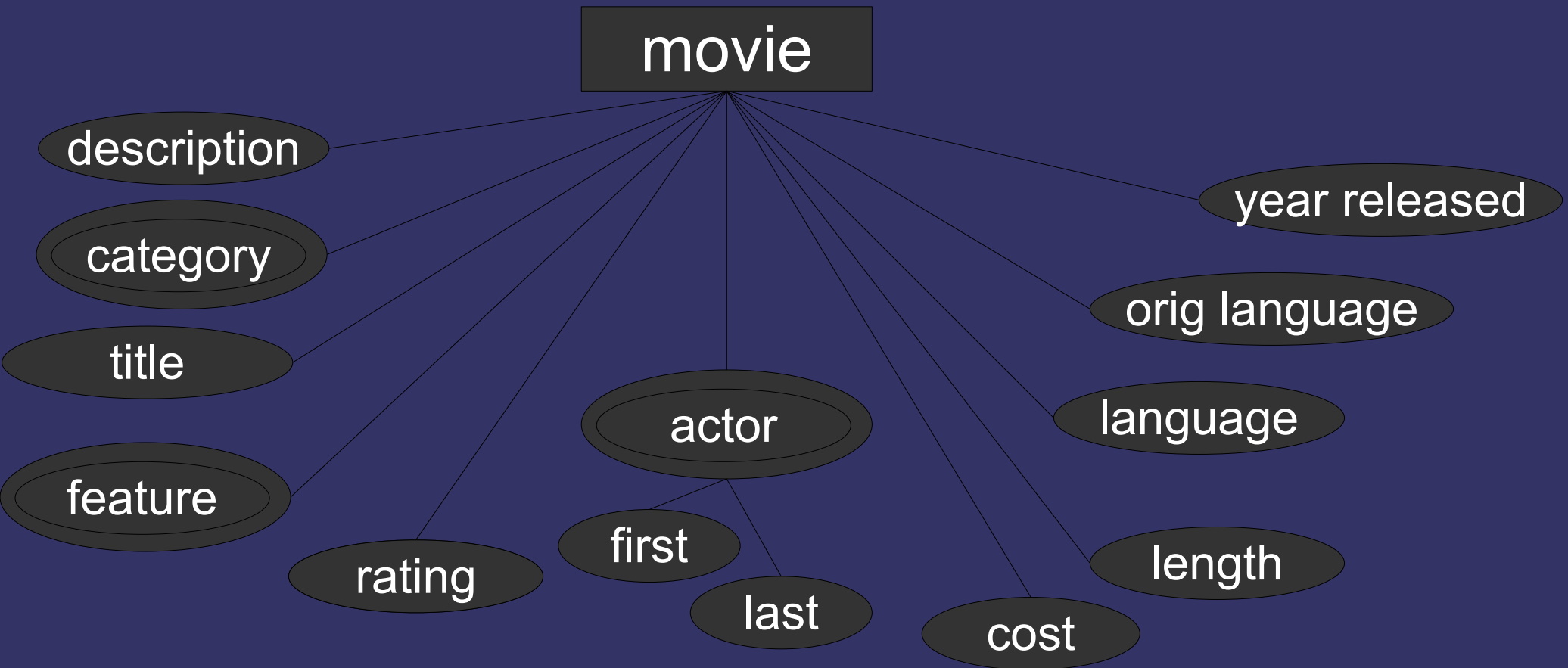
- ⇒ Entity Sets (rectangle)
- ⇒ Attributes (ellipse)
 - simple/composite
 - single/multi
- ⇒ Relationships (diamond)

Basic Movie ER Diagram



Find: Composite attribute, multivalued attributes

Basic Movie ER Diagram

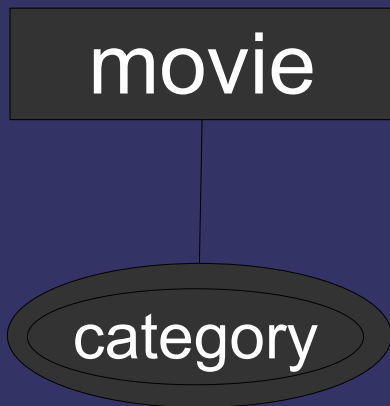


What's wrong with this diagram?

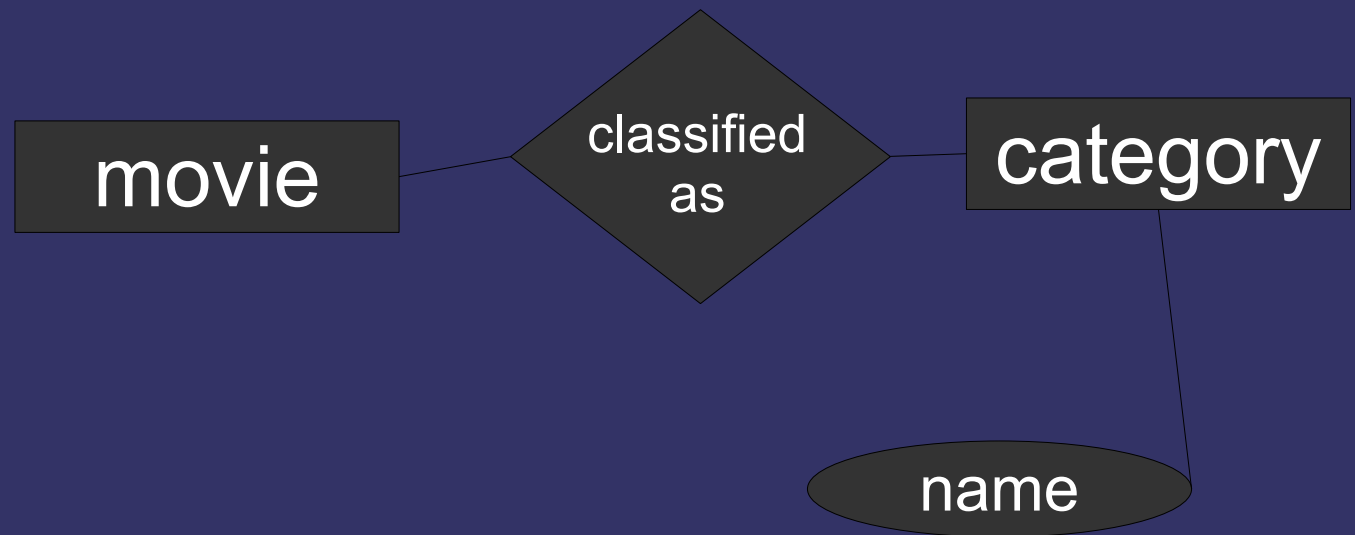
Same Issues as Spreadsheet!

- ➔ Redundant attributes may be entities

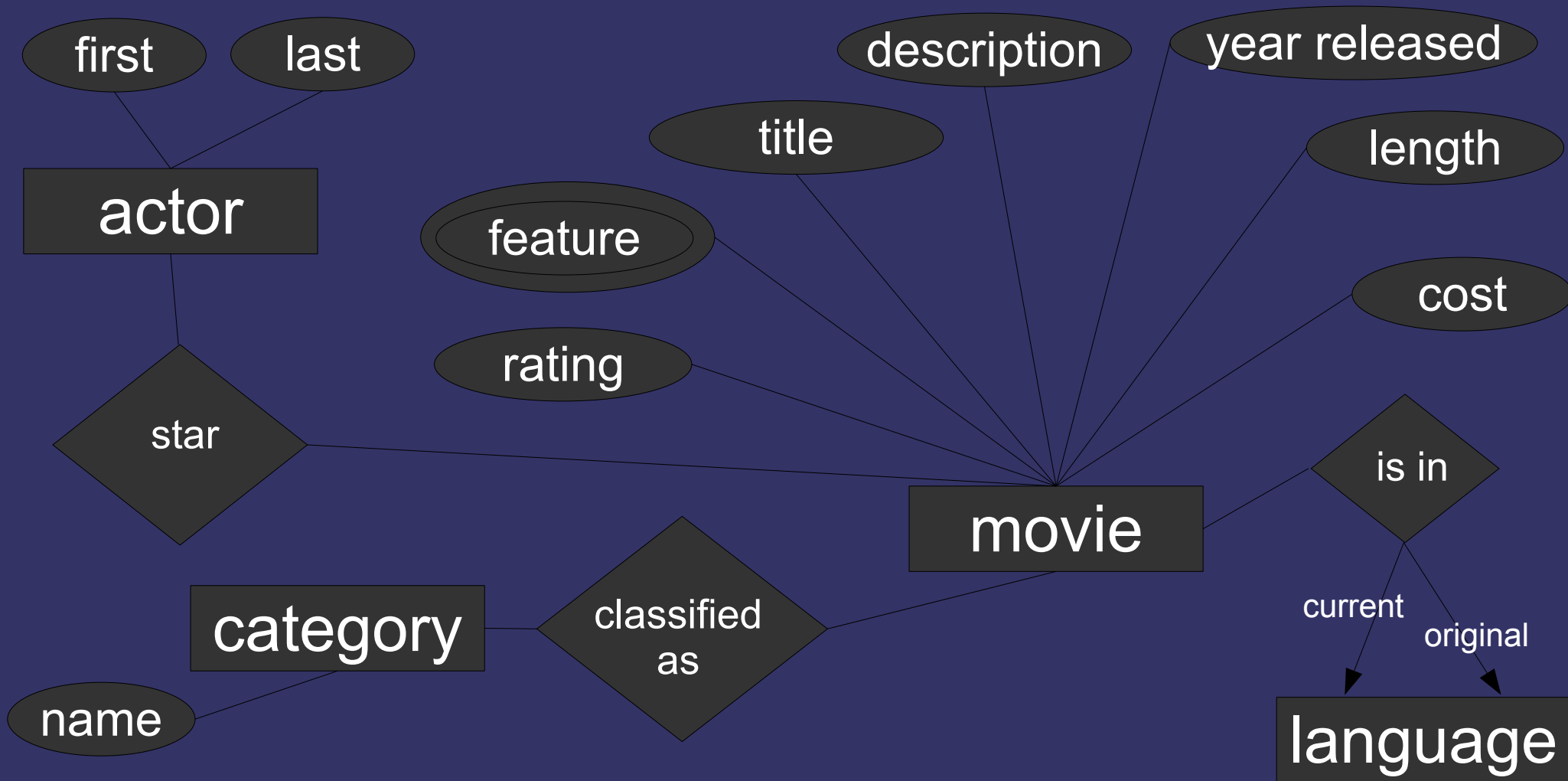
category as
attribute



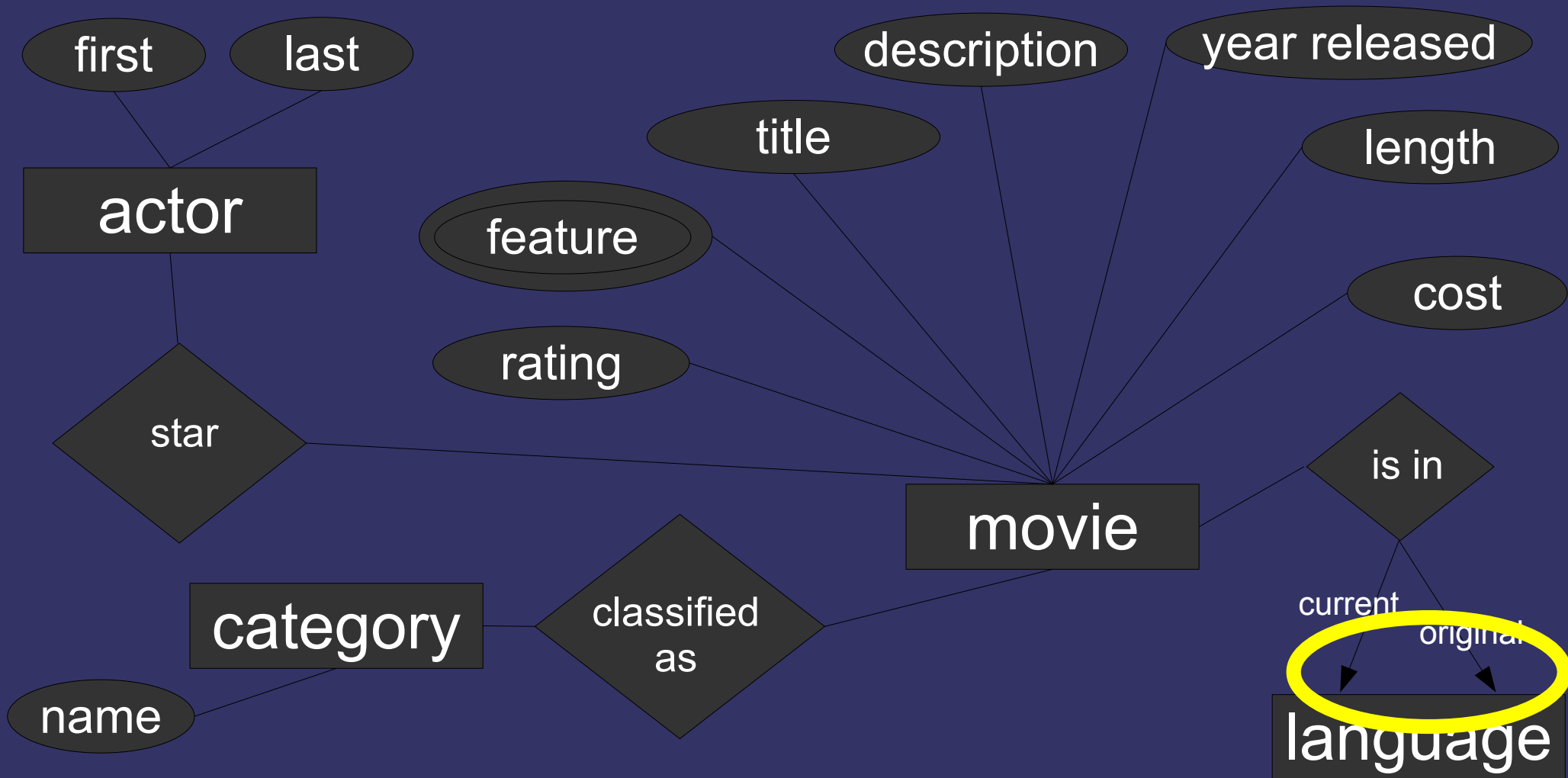
category as entity



Better Movie ER Diagram



Better Movie ER Diagram



Ready to Create Tables

- ⇒ For now, 1 table per entity
- ⇒ But first, decide data types
- ⇒ Chapter 9 of the MySQL 5.0 Manual is Data types

Arbitrary String Data

➔ Movie title, description

Actor first, last name

<http://dev.mysql.com/doc/refman/5.0/en/string-types.html>

Strings Defined

- ⇒ Movie title, description
 - title varchar(255) NOT NULL
 - description text

Actor first, last name

first_name varchar(45) NOT NULL

last_name varchar(45) NOT NULL

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Actor first, last name

first_name varchar(45) NOT NULL
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Numeric Data

- ⇒ Length (in minutes)
- ⇒ Cost (in USD)
- ⇒ Year released (YYYY format)
- ⇒ <http://dev.mysql.com/doc/refman/5.0/en/numeric-types.html>

Numeric Data Defined

- ⇒ Length (in minutes)
 - Length smallint(5) unsigned default NULL,
- ⇒ Cost (in USD)
 - Cost decimal(4,2) NOT NULL default '19.99'
- ⇒ Year released (YYYY format)
 - release_year year(4) default NULL

- ⇒ <http://dev.mysql.com/doc/refman/5.0/en/year.html>

Numeric Data Defined

- ⇒ Length (in minutes)
 - Length `smallint(5) unsigned` default `NULL`,
- ⇒ Cost (in USD)
 - Cost `decimal(4,2) NOT NULL` default `'19.99'`
- ⇒ Year released (YYYY format)
 - `release_year year(4)` default `NULL`
- ⇒ <http://dev.mysql.com/doc/refman/5.0/en/year.html>

Choices

- ⇒ MPAA Rating
 - Must have exactly one defined
- ⇒ DVD Special Features
 - Can be one or more
- ⇒ <http://dev.mysql.com/doc/refman/5.0/en/enum.html>
- ⇒ <http://dev.mysql.com/doc/refman/5.0/en/set.html>

Choices Defined

⇒ MPAA Rating

- rating enum('G','PG','PG-13','R','NC-17') default 'G'

⇒ DVD Special Features

- special_features set('Trailers', 'Commentaries', 'Deleted Scenes', 'Behind the Scenes') default NULL

Choices Defined

⇒ MPAA Rating

- rating enum('G','PG','PG-13','R','NC-17', default 'G')

⇒ DVD Special Features

- special_features set('Trailers', 'Commentaries', 'Deleted Scenes', 'Behind the Scenes') default NULL

What Type?

- ⇒ Choice or arbitrary string?
- ⇒ Category
- ⇒ Language

What Type?

⇒ Both!!

```
CREATE TABLE category (  
    name varchar(25) NOT NULL  
);
```

```
CREATE TABLE language (  
    name char(20) NOT NULL  
);
```

What Type?

⇒ Both!!

```
CREATE TABLE category (  
    name varchar(25) NOT NULL  
);
```

```
CREATE TABLE language (  
    name char(20) NOT NULL  
);
```

Next Time

- ➔ INSERT
- ➔ SELECT
- ➔ Questions, Comments?