Final Database Project (Johnson Video)

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Note - It's important to Note that for this project, I took "video" to mean, a physical media type similar to a DVD (i.e. VHS, not streamed video). The description of "video" in the given problem makes it bit ambiguous, but I hope this was the intended interpretation.

1.) Entity And Attribute Descriptions:

Our Database has 8 tables, each detailing many attributes (see ERD below).

The Customer table holds information about our customers. The Customer ID serves as the primary key. The other attributes include the customer name, the address of the customer, phone number, credit card number, and there are 4 attributes detailing rental totals. The "rental total fields" hold information about the total rentals the customer has made, the number of rentals in the last 30 days, rentals in the last 365 days, and the number of active rentals.

The Movie Library is the table holding all of the movies Mom and Pop offer. This table uses the Movie Code attribute as the primary key and thus the Movie Code is unique for every movie. The other attributes are the Movie Name, the genre, the movie rating, the runtime or length of the movie, and the date the movie was released.

The Media Inventory table keeps information about all of the movie copies Mom and Pop have. Each row in the table either represents a DVD copy or Video copy of a movie. This table uses a composite key, which includes the Movie Code, the Set ID, and the DVDorVideo Boolean. The Set ID is the unique identifier for copies of the same DVD or Video. The other attributes include a Boolean for if the copy is currently rented, the last Rental ID associated with the copy, and the distributor ID, identifying the distributor we purchased the movie copy from.

The Distributor table serves to house information about the companies Mom and Pop buy new movies from. The table uses the Distributor ID as a primary key. Other details like the distributor's name, address, and phone number are also included in the table.

The database also has a Movie Catalog table. This table serves as an electronic catalog; combining the catalog we get from each distributor Mom and Pop deals with. Each distributor uses their own set of identification numbers for movies; this is the Movie ID field. For this table we again use a composite key, this time including the Movie ID field, the distributor ID field, and a boolean identifying if the movie is a DVD copy or a Video copy. The other attributes include the price per unit of the movie, and the movie name (as provided by the distributor's catalog).

We also have an Actors table, which uses the field Actor ID as a primary key. The table also includes the actor's name, actor's age, and the country the actor was born.

The Movie Credit table relates movies to actors/producers that work on them. Each row in the Movie Credit table represents a specific role by an actor or producer. The Movie Credit table makes use of a composite primary key, which includes the Movie Code and Actor ID. The table also contains details like the actual credit (i.e. Actor, Director, etc.), the role (i.e. lead, supporting, extra), and a Boolean for if the role earned an Oscar award.

The table that tracks rentals from customers is called the Rentals table. Each row in this table has a unique Rental ID (the primary key) and represents an individual rental of a movie copy. This table includes the identifying information

about the exact movie copy (Movie Code, Set ID, and DVDorVideo). It also includes details about the rental date, due date, and return date of the movie. The table includes the Customer ID associated with the rental, a Boolean representing whether the rental is late, and a field for the late fees, and one for the total rental bill.

2.) Relationship Sentence Pairs:

For each entity of “Customer” there can be one to many entities of “Rentals”.

For each entity of “MovieLibrary” there can be one to many entities of “MediaInventory”.

For each entity of “MovieLibrary” there can be one to many entities of “MovieCredits”.

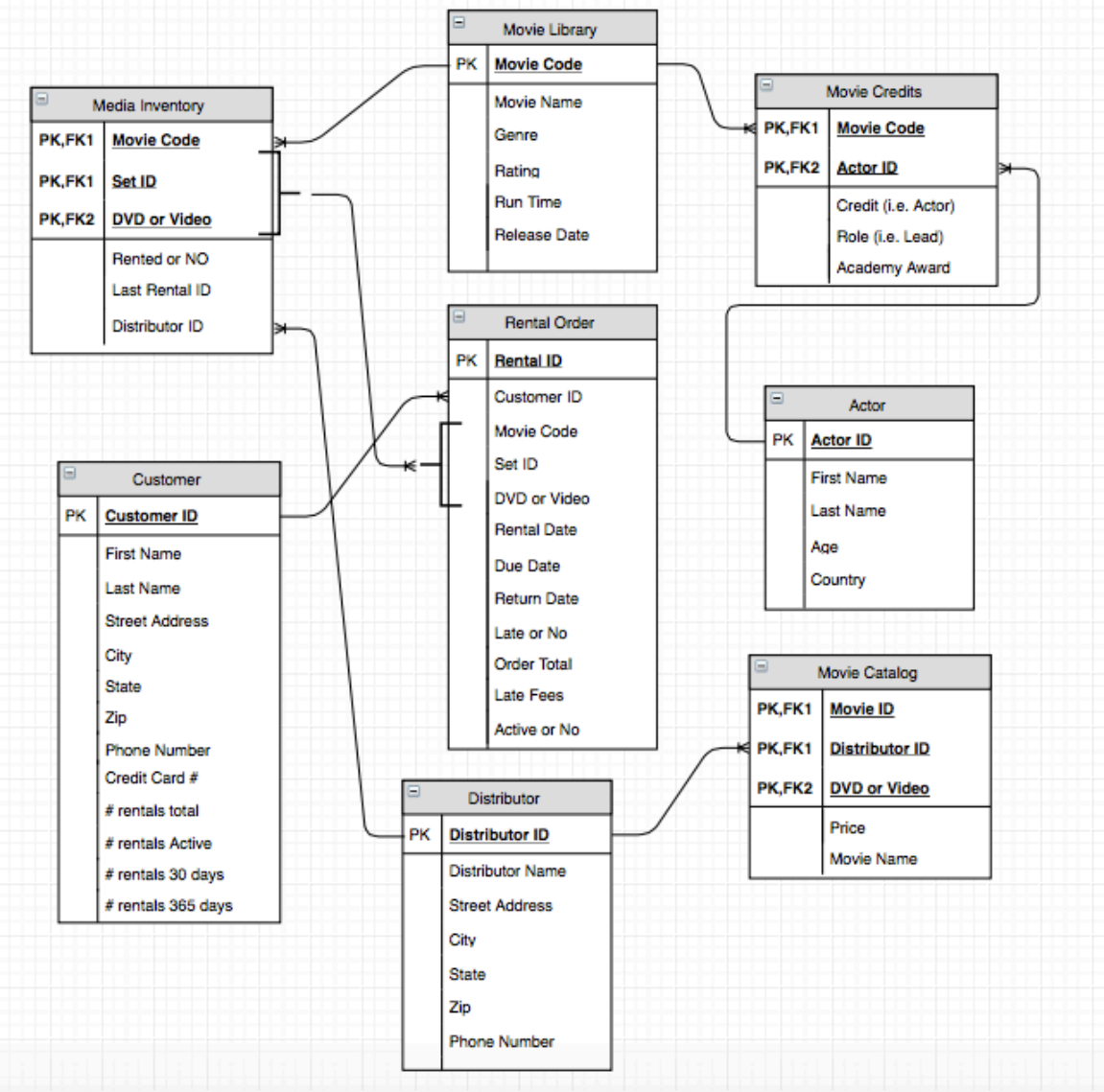
For each entity of “Actors” there can be one to many entities of “MovieCredits”.

For each entity of “Distributor” there can be one to many entities of “MediaInventory”.

For each entity of “Distributor” there can be one to many entities of “Movie Catalog”.

For each entity of “MediaInventory” there can be one to many entities of “Rentals”.

3.) ERD



4.) Look at attached file metadata.xlsx

5.) Look at attached file tables.sql (results pictured)

```
mysql> source ~/Desktop/tables.sql
Query OK, 0 rows affected (0.13 sec)

Query OK, 0 rows affected (0.59 sec)

Query OK, 0 rows affected (0.29 sec)

Query OK, 0 rows affected (0.34 sec)

Query OK, 0 rows affected (0.28 sec)

Query OK, 0 rows affected (0.29 sec)

Query OK, 0 rows affected (0.41 sec)

Query OK, 0 rows affected (0.28 sec)

mysql>
```

6.) Look at attached file insertsDML.sql (results pictured)

```
mysql> source ~/Desktop/insertsDML.sql
Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql>
```

7.) Look at attached file queries.sql, includes comments (results pictured for #2 through #7 queries)

```
+-----------+---------+--------+------------+-------+---------+-----------+----------+-----+---------+
| MovieCode | ActorID | Credit | Role       | Oscar | ActorID | FirstName | LastName | Age | Country |
+-----------+---------+--------+------------+-------+---------+-----------+----------+-----+---------+
|    123399 | 2343679 | Actor  | Lead       |     1 | 2343679 | Cristian  | Bale     |  42 | England |
|    123399 | 3444554 | Actor  | Lead       |     0 | 3444554 | Steve     | Carrell  |  54 | USA     |
|    123399 | 4443457 | Actor  | Supporting |     0 | 4443457 | Brad      | Pitt     |  52 | USA     |
|    144896 | 3567279 | Actor  | Lead       |     0 | 3567279 | Chris     | Rock     |  51 | USA     |
|    197438 | 8124357 | Actor  | Lead       |     1 | 8124357 | Jeff      | Bridges  |  66 | USA     |
+-----------+---------+--------+------------+-------+---------+-----------+----------+-----+---------+
5 rows in set (0.00 sec)

+-----------+----------+------------+---------------------+-------+
| FirstName | LastName | CustomerID | StreetAddress       | Zip   |
+-----------+----------+------------+---------------------+-------+
| Ryan      | Smith    |     100001 | 5103 S. Baxter Cir. | 80121 |
| Nikola    | Tesla    |     100002 | 110 N. Cerressa Way. | 80543 |
| Ryan      | Giggs    |     100003 | 873 Green Grove Ave. | 80222 |
| Nikola    | Tesla    |     100004 | 19 W. Brexit Cir.   | 80443 |
| Jonee     | McGee    |     100005 | 1223 S. Hampton Dr. | 80113 |
+-----------+----------+------------+---------------------+-------+
5 rows in set (0.00 sec)

+-----------+-------+-----------------+------------+
| moviecode | SetID | moviename       | rentaldate |
+-----------+-------+-----------------+------------+
|    123399 |     1 | The Big Short   | 2016-08-12 |
|    197438 |     1 | The Big Lebowski | 2016-08-12 |
|    144896 |     4 | Rush Hour       | 2016-08-14 |
+-----------+-------+-----------------+------------+
3 rows in set (0.00 sec)

Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

Query OK, 1 row affected (0.00 sec)

mysql>
```

Individual Tables can be found at bottom of report.

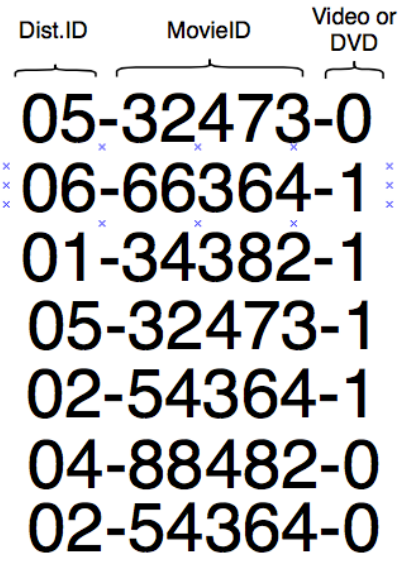
Process:

(Buying a Movie and renting it to out to a customer)

Lets say Mom and Pop want to buy a new movie (The Big Short) to add to their rental library. Lets say they want 25 DVDs and 10 videos. The first thing they want to do is search for “The Big Short” in the MovieCatalog table -which is essentially a combined electronic catalog from all of the distributors Mom and Pop do business with. Each row in this table represents a specific DVD or Video offered by a distributor. Each distributor uses their own Movie ID for different movies they offer. The Movie Catalog uses a 3-part composite primary key. The three fields for

the PK are the Distributor ID, the Movie ID, and finally a Boolean value identifying if it's a video or DVD.

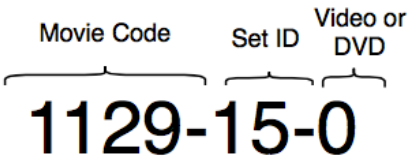
MediaCatalog PK Examples:



Above is a set of possible Primary Keys generated form a "the big short" search. You can see Mom and Pop have three distributors offering DVDs and four offering Videos. Mom and Pop can refine the search to just DVDs or Videos if they wish. The table also includes the price per unit, so Mom and Pop can simply search the table for the best price. Once they make a selection, mom and pop can contact the distributor and place their order. Once Mom and Pop receive the DVDs and Videos (35 total), They can make them available for customers. First, when any new movie arrives, a new row in MovieLibrary gets generated –this is where we can see every movie Mom and Pop offer. In this case, "The Big Short" gets a newly generated and unique Movie Code – discussed above in descriptions. Next 35 new rows in "Media Inventory" get generated, each representing a different copy of "The Big

Short" – 25 DVDs and 10 Videos. Like we explained, the Media Inventory also uses a composite Primary Key (Movie Code + Set ID + Boolean value identifying if it's a video or movie). Set ID being the identifier for copies of the same DVD or Video (i.e. Each DVD for "The Big Short" will have a Set ID from 1 to 25).

Media Inventory PK Example:



Whenever a new movie gets purchased, The Actors and Movie Credits tables also get updated. Now customers and staff can now search and find the "The Big Short" by its list of credited actors and producers.

Now that "The Big Short" is available to rent at Johnson Video, Eric Bishop comes in and wants to rent it. Eric is renting a DVD copy of "The Big Short", and a Video copy of "Rush Hour". As Eric checks out, two rows in Media Inventory must get updated; one for his copy of "The Big Short" and one for "Rush Hour". The field labeled "Rented or No" gets changed form a zero to a one. Also two new Rental ID's get added to the Rentals table; one for each media item Eric is renting. Each row in Rentals is essentially an invoice of a rental from a customer; detailing things like Rental Date, Due Date, the date the movie was returned, late fees, and of course the customer ID and details about the specific Media item (Movie Code, Set ID, DVD or Video). When Eric returns the movies, the date is logged, any late charges are calculated and the rental order is marked as closed – "Active" Boolean changes from zero to one. When a copy of a movie is returned, it is cleaned, rewound, and then

finally the “Rented or No” field gets changed back form a one to a zero - marking the media as returned.

The database also aids in account management. Each account (aka Customer ID within the customers table) gets updated as the customer makes rentals. The customer table contains basic information but also tracks the number of total rentals, active rentals, rentals within a month’s time, and rentals within a years time. Customer also keeps track of credit card number, so we can charge a customer if they fail to return a movie.

A customer can also come in and we can find a movie by the actors, directors, and or producers that worked on it. Lets say a customer comes in and wants to watch a recent movie with Tom Hanks. We can search the Movie Credits Table – which details specific roles and credits for actors/directors. For instance if we search “Tom Hanks”, we should get a row for every movie he was involved with; one for Forrest Gump, one for Captain Phillips, etc. Similarly if we searched “Forrest Gump”, we should get every credited member of the movie and the details for this “credit”. Movie Credit includes details like the movie code, the person’s role (i.e. Lead Actor, Supporting Cast, etc.), the specific credit (i.e. Director, Actor), and a Boolean value identifying if the person was awarded an Oscar. We can cross reference each movie code from our “Tom Hanks” search with the details in Movie Library to include the release date for each movie. We now can give the customer four or five recent “Tom Hanks” movie options.

Individual Tables Displayed:

CustomerID	FirstName	LastName	StreetAddress	City	State	Zip	PhoneNumber	CreditCard	TotalNumOfRentals	NumOfActiveRentals	NumO
100001	Ryan	Smith	5103 S. Baxter Cir.	Denver	CO	80121	3034332214	10823828238382	2	2	
100002	Nikola	Tesla	110 N. Cerressa Way.	CO Springs	CO	80543	7902339514	12948827767391	1	0	
100003	Ryan	Giggs	873 Green Grove Ave.	Denver	CO	80222	3038782914	18929999232113	10	1	
100004	Nikola	Tesla	19 W. Brexit Cir.	Lakewood	CO	80443	3039032433	13332991199779	3	0	
100005	Jonee	McGee	1223 S. Hampton Dr.	Denver	CO	80113	3034332214	10022344847321	19	1	

5 rows in set (0.00 sec)

RentalID	CustomerID	MovieCode	SetID	DVDorVideo	RentalDate	DueDate	ReturnDate	LateorNO	TotalBill	LateFees	ActiveOrNO
3254553	100004	123399	1	1	2016-01-02	2016-01-07	2016-01-06	0	5.55	0.00	0
3254554	100001	123399	1	1	2016-08-12	2016-08-17	NULL	0	5.55	NULL	1
3254555	100001	197438	1	1	2016-08-12	2016-08-17	NULL	0	5.55	NULL	1
3254556	100003	144896	1	0	2016-08-14	2016-08-19	NULL	0	4.72	NULL	1
3254557	100005	144896	4	1	2016-08-14	2016-08-19	NULL	0	5.55	NULL	1

5 rows in set (0.00 sec)

MovieCode	SetID	DVDorVideo	RentedOrNO	LastRentalID
123399	1	0	0	10389991
123399	1	1	1	10023932
144896	1	0	1	10011993
144896	4	1	1	10977325
197438	1	1	1	10023932

5 rows in set (0.00 sec)

MovieCode	MovieName	Genre	Rating	RunTime	ReleaseDate
123399	The Big Short	Drama	4	02:00:24	2015-05-02
144896	Rush Hour	Comedy	4	01:45:14	1999-05-12
144897	Rush Hour 2	Comedy	3	01:52:53	2001-08-25
166369	Oceans Eleven	Drama	4	01:56:50	2001-09-18
197438	The Big Lebowski	Comedy	4	01:57:24	1998-11-02

DistID	DistName	StreetAddress	City	State	Zip	PhoneNumber
1	Movie Outlet	299 S. Brisset Ave.	Sherby	WI	40123	4532338864
2	Resource Media	132 Graham St.	Los Angeles	CA	29226	6557739899
3	DVD and Video Plus	8388 Brown Rd.	Delph	TX	74463	7573938891
4	American Movie	5 W. Franklin Crt.	Orlando	FL	30111	3997795864
5	All Source	985 W. Straw Cir.	Durango	CO	89932	3348831121

5 rows in set (0.00 sec)

MovieID	DistID	DVDorVideo	MovieName	MoviePrice
2323423	1	1	Big	3.35
2476843	5	1	Limitless	6.19
7664522	3	0	Predator	4.25
8886432	4	0	Sully	9.52
9834239	1	1	Crash	4.05

5 rows in set (0.00 sec)

MovieCode	ActorID	Credit	Role	Oscar
123399	2343679	Actor	Lead	1
123399	3444554	Actor	Lead	0
123399	4443457	Actor	Supporting	0
144896	3567279	Actor	Lead	0
197438	8124357	Actor	Lead	1

5 rows in set (0.00 sec)

ActorID	FirstName	LastName	Age	Country
2343679	Cristian	Bale	42	England
3444554	Steve	Carrell	54	USA
3567279	Chris	Rock	51	USA
4443457	Brad	Pitt	52	USA
8124357	Jeff	Bridges	66	USA