PowerBI – BI Applications & SQL Queries   **January 9, 2020**

Requirements:

Source: Sakila databases on:
- MySQL

https://dev.mysql.com/doc/sakila/en/sakila-structure-tables.html
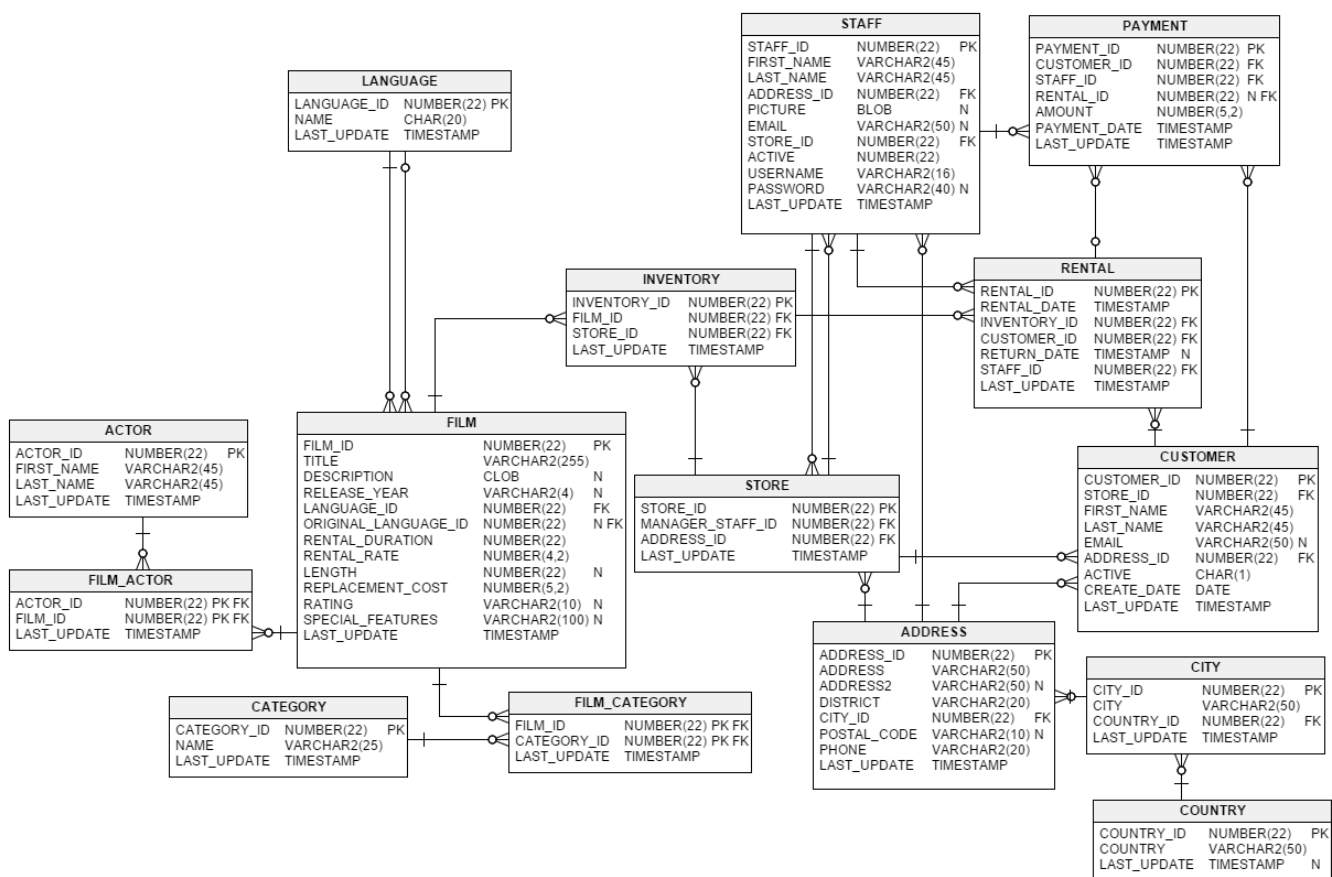
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Deliverables:
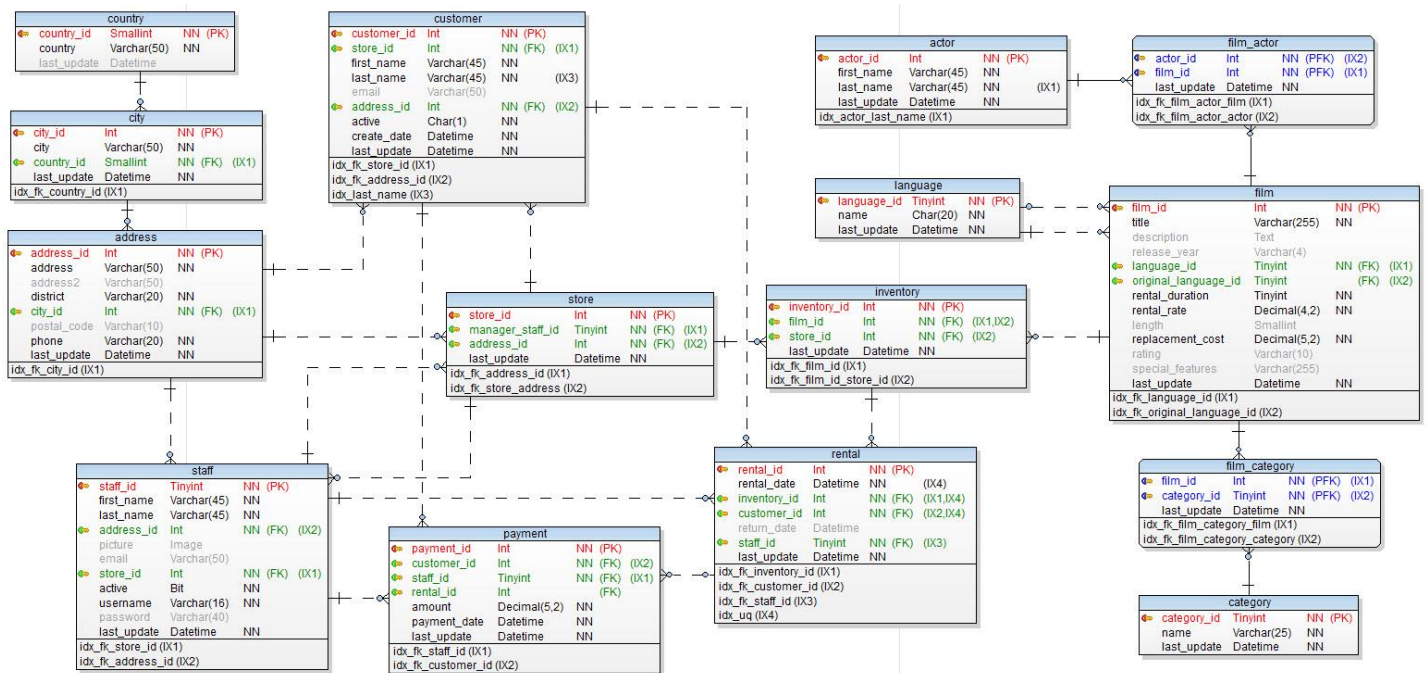
BI: Create data visualizations with:
- Power BI with MySQL

1. Create BI visualizations
2. Create & run SQL queries
3. Upload spreadsheet or csv file with SQL query results
4. After completing visualizations then upload BI application file

Measures:
- RentalQuantity = number of times a film has been rented
- RentalAmount = Payment amount in $

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country
country_id	Smallint	NN (PK)
country	Varchar(50)	NN
last_update	Datetime	

city
city_id	Int	NN (PK)
city	Varchar(50)	NN
country_id	Smallint	NN (FK) (IX1)
last_update	Datetime	NN
idx_fk_country_id (IX1)		

address
address_id	Int	NN (PK)
address	Varchar(50)	NN
address2	Varchar(50)	
district	Varchar(20)	NN
city_id	Int	NN (FK) (IX1)
postal_code	Varchar(10)	
phone	Varchar(20)	NN
last_update	Datetime	NN
idx_fk_city_id (IX1)		

staff
staff_id	Tinyint	NN (PK)
first_name	Varchar(45)	NN
last_name	Varchar(45)	NN
address_id	Int	NN (FK) (IX2)
picture	Image	
email	Varchar(50)	
store_id	Int	NN (FK) (IX1)
active	Bit	NN
username	Varchar(16)	NN
password	Varchar(40)	
last_update	Datetime	NN
idx_fk_store_id (IX1)		
idx_fk_address_id (IX2)		

customer
customer_id	Int	NN (PK)
store_id	Int	NN (FK) (IX1)
first_name	Varchar(45)	NN
last_name	Varchar(45)	NN (IX3)
email	Varchar(50)	
address_id	Int	NN (FK) (IX2)
active	Char(1)	NN
create_date	Datetime	NN
last_update	Datetime	NN
idx_fk_store_id (IX1)		
idx_fk_address_id (IX2)		
idx_last_name (IX3)		

store
store_id	Int	NN (PK)
manager_staff_id	Tinyint	NN (FK) (IX1)
address_id	Int	NN (FK) (IX2)
last_update	Datetime	NN
idx_fk_address_id (IX1)		
idx_fk_store_address (IX2)		

payment
payment_id	Int	NN (PK)
customer_id	Int	NN (FK) (IX2)
staff_id	Tinyint	NN (FK) (IX1)
rental_id	Int	(FK)
amount	Decimal(5,2)	NN
payment_date	Datetime	NN
last_update	Datetime	NN
idx_fk_staff_id (IX1)		
idx_fk_customer_id (IX2)		

rental
rental_id	Int	NN (PK)
rental_date	Datetime	(IX4)
inventory_id	Int	NN (FK) (IX1,IX4)
customer_id	Int	NN (FK) (IX2,IX4)
return_date	Datetime	
staff_id	Tinyint	NN (FK) (IX3)
last_update	Datetime	NN
idx_fk_inventory_id (IX1)		
idx_fk_customer_id (IX2)		
idx_fk_staff_id (IX3)		
idx_uq (IX4)		

inventory
inventory_id	Int	NN (PK)
film_id	Int	NN (FK) (IX1,IX2)
store_id	Int	NN (FK) (IX2)
last_update	Datetime	NN
idx_fk_film_id (IX1)		
idx_fk_film_id_store_id (IX2)		

actor
actor_id	Int	NN (PK)
first_name	Varchar(45)	NN
last_name	Varchar(45)	NN (IX1)
last_update	Datetime	NN
idx_actor_last_name (IX1)		

language
language_id	Tinyint	NN (PK)
name	Char(20)	NN
last_update	Datetime	NN

film_actor
actor_id	Int	NN (PFK) (IX2)
film_id	Int	NN (PFK) (IX1)
last_update	Datetime	NN
idx_fk_film_actor_film (IX1)		
idx_fk_film_actor_actor (IX2)		

film
film_id	Int	NN (PK)
title	Varchar(255)	NN
description	Text	
release_year	Varchar(4)	
language_id	Tinyint	NN (FK) (IX1)
original_language_id	Tinyint	(FK) (IX2)
rental_duration	Tinyint	NN
rental_rate	Decimal(4,2)	NN
length	Smallint	
replacement_cost	Decimal(5,2)	NN
rating	Varchar(10)	
special_features	Varchar(255)	
last_update	Datetime	NN
idx_fk_language_id (IX1)		
idx_fk_original_language_id (IX2)		

film_category
film_id	Int	NN (PFK) (IX1)
category_id	Tinyint	NN (PFK) (IX2)
last_update	Datetime	NN
idx_fk_film_category_film (IX1)		
idx_fk_film_category_category (IX2)		

category
category_id	Tinyint	NN (PK)
name	Varchar(25)	NN
last_update	Datetime	NN

Questions: answer questions with sql queries & then do visualizations

1. Rentals by Customer Geography
   1.1. Contribution of Countries & Cities (in hierarchy) by rental amount - Treemap (or Heatmap) & sql query
   1.2. Rental amounts by countries for PG & PG-13 rated films - bar chart & sql query
   1.3. Top 20 cities by number of customers who rented - bar chart & sql query
   1.4. Top 20 cities by number of films rented - bar chart & sql query
   1.5. Rank cities by average rental cost - bar chart & sql query

2. Rentals by Film Category
   2.1. Film categories by rental amount (ranked) & rental quantity – tabular & sql query
   2.2. Film categories by rental amount (ranked) – bar chart & sql query
   2.3. Film categories by average rental amount (ranked) & – tabular & sql query
   2.4. Contribution of Film Categories by number of customers - Treemap (or Heatmap) & sql query
   2.5. Contribution of Film Categories by rental amount - Treemap (or Heatmap) & sql query

3. Rentals by Film
   3.1. List Films with rental amount, rental quantity, rating, rental rate, replacement cost and category name – tabular & sql query
   3.2. List top 10 Films by rental amount (ranked) – bar chart & sql query
   3.3. List top 20 Films by number of customers (ranked) – bar chart & sql query
   3.4. List Films with the word "punk" in title with rental amount and number of customers – tabular & sql query
   3.5. Contribution by rental amount for films with a documentary category - Treemap (or Heatmap) & sql query

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4. Rentals by Customer (Last name, First Name)
    4.1. List Customers (Last name, First Name) with rental amount, rental quantity, active status, country and city – tabular & sql query
    4.2. List top 10 Customers (Last name, First Name) by rental amount (ranked) for PG & PG-13 rated films – bar chart & sql query
    4.3. Contribution by rental amount for customers from France, Italy or Germany - Treemap (or Heatmap) & sql query
    4.4. List top 20 Customers (Last name, First Name) by rental amount (ranked) for comedy films – bar chart & sql query
    4.5. List top 10 Customers (Last name, First Name) from China by rental amount (ranked) for films that have replacement costs greater than $24 – bar chart & sql query