Developing a Database for Netflix

Database and SQL

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I. Introduction

Netflix provides streaming movies and TV shows to over 75 million subscribers across the globe. Customers can watch as many shows/ movies as they want as long as they are connected to the internet for a monthly subscription fee of about ten dollars. Netflix produces original content and also pays for the rights to stream feature films and shows.

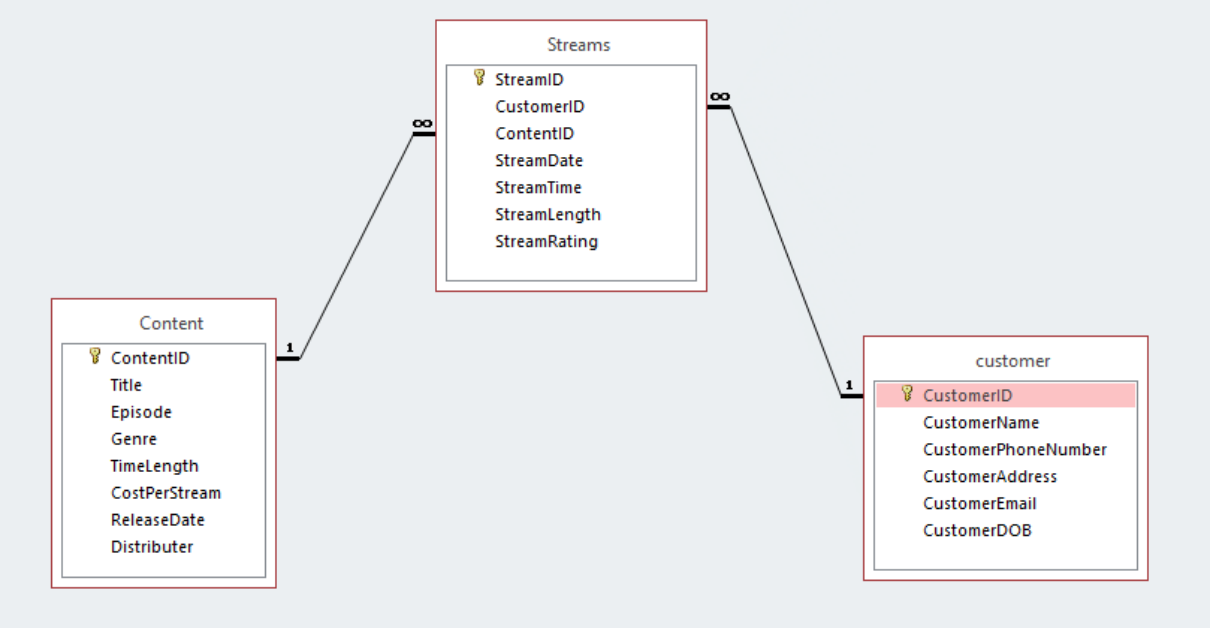
In order to understand customer behavior, Netflix needs to track its customers, its content, and the content that specific customers watch. Understanding which users watch which shows and movies will allow the firm to recommend similar content that the user will also likely enjoy. This type of data collection and analysis in order to provide recommendations offers customers an enjoyable, convenient streaming experience. Moreover, the database will track important metrics such as customer churn and poor performing content (content that receives poor ratings and content that is rarely streamed).

II. Database Design

In order for Netflix to collect the information it needs, three tables need to be established. Netflix first needs to compile a table listing all of its content (movies, tv shows, etc). Content will be uniquely identified by its 'Content ID'. For TV shows, each episode will have a unique Content ID. Netflix also needs to gather information on its customers. The customer table will collect data including individual customer names, phone numbers, addresses, emails, and dates of birth. Customers are uniquely identified by their 'CustomerID'. Once Netflix is properly recording all content and customers, it also needs a table for streams. A stream is defined as an instance when a unique customer watches a unique piece of content. Streams are uniquely identified by a 'StreamID' and also characterized by the Customer's ID, the Content's ID, the date of the stream, the time of the stream, the length or duration of the stream (i.e., did the customer watch the entire show or movie?) and finally the rating that the customer gives the content.

Figure 1

Relationships Diagram



III. Table Schemas

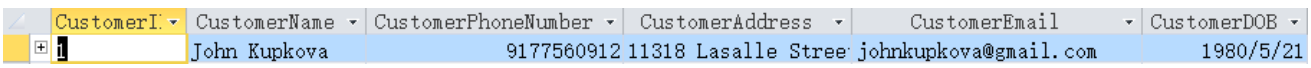
Table 1

Customer Table

Field	Type	Length	Description	Primary Key or Foreign Key
CustomerID	Character with fixed length	9	Uniquely identifies a customer	Primary Key
CustomerName	Character with fixed length	20	Shows a customer name	
CustomerPhoneNumber	Number	15	Shows a customer phone number	
CustomerAddress	Character with fixed length	30	Shows a customer address	
CustomerEmail	Character with fixed length	30	Shows a customer email	
CustomerDOB	Date		Shows a customer birthday	

Figure 2

Example of a Record from the Customer Table.



CustomerI	CustomerName	CustomerPhoneNumber	CustomerAddress	CustomerEmail	CustomerDOB
1	John Kupkova	9177560912	11318 Lasalle Stree	johnkupkova@gmail.com	1980/5/21

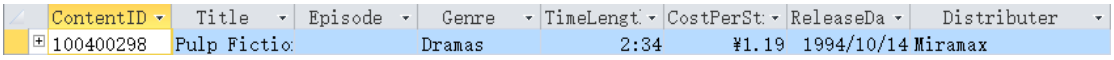
Table 2

Content Table

Field	Type	Length	Description	Primary Key or Foreign Key
ContentID	Character with fixed length	9	Uniquely identifies a content	Primary Key
Title	String with variable length	50	Shows the title of a content	
Episode	String with variable length	10	Shows the episode of a content	
Genre	String with variable length	20	Shows the category of a content	
TimeLength	Time		Shows the length of a content	
CostPerStream	Currency		Shows the cost of every stream	
ReleaseDate	Date		Shows the release date of a content	
Distributer	String with variable length	20	Shows the distributer of a content	

Figure 3

Example of a Record from the Content Table.



ContentID	Title	Episode	Genre	TimeLengt	CostPerSt	ReleaseDa	Distributer
100400298	Pulp Fictio		Dramas	2:34	¥1.19	1994/10/14	Miramax

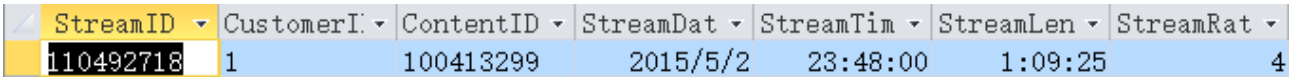
Table 3

Streams Table

Field	Type	Length	Description	Primary Key or Foreign Key
StreamID	Character	9	Uniquely identifies a stream	Primary Key
CustomerID	Character	9	Identifies a customer	Foreign Key
ContentID	Character	9	Identifies a content	Foreign Key
StreamDate	Character	10	Shows the date of a stream	
StreamTime	Time		Shows the time of a stream	
StreamLength	Time		Shows the length of a stream	
StreamRate	Number		Shows the rate of a stream	

Figure 4

Example of a Record from the Streams Table.



StreamID	CustomerI	ContentID	StreamDat	StreamTim	StreamLen	StreamRat
110492718	1	100413299	2015/5/2	23:48:00	1:09:25	4

IV. Queries

SELECT *
FROM Content

ContentID	Title	Episode	Genre	TimeLength	CostPerStrea	ReleaseDate	Distributer
100400298	Pulp Fiction		Dramas	2:34	$1.19	10/14/1994	Miramax
100413299	Moonrise Kingd		Adventure	1:34	$0.89	6/29/2012	Focus Features
200309400	House of Cards	S1 E1	TV Dramas	0:56	$0.09	2/1/2015	Netflix
200309401	House of Cards	S1 E2	TV Dramas	0:49	$0.09	2/1/2015	Netflix
200309402	House of Cards	S1 E3	TV Dramas	0:41	$0.09	2/1/2015	Netflix
200412638	Friends	S10 E1	TV Comedy	0:24	$1.25	9/25/2003	Warner Bros

This query returns all columns and all rows of the Content table in the database. This query is useful when one needs to visualize all potentially useful information in the Content Table.

SELECT CustomerName, CustomerPhoneNumber, CustomerEmail
FROM Customer

CustomerName	CustomerPhoneNumber	CustomerEmail
John Kupkova	9177560912	johnkupkova@gmail.com
Carlos Edwards	1235557494	NA
Michael Eggerer	1473030335	MichaelEgg@yahoo.com
Ming Xiao	3478888888	10000gcnm@163.com
Doubi Xiao	5963344520	ngdb@shabi.com
Peter Andersen	1234567890	PAndersen@gmail.com
Daniel Goldschmidt	5265555261	Goldman@qq.com
Hougen Jiao	9957480487	cuojiaohougen@126.com

This query returns the name, phone number, and email for each customer in the database. The purpose of this query is to return customer contact information. If Netflix was running a new promotional campaign and needed to get in touch with all their customers by phone and/or email, this query would provide the information they need.

SELECT Customer.CustomerID, Customer.CustomerName, Customer.CustomerEmail .Streams.StreamDate, Streams.StreamRating
FROM Customer, Streams
WHERE Customer.CustomerID = Streams.CustomerID;

CustomerID	CustomerName	CustomerEmail	StreamDate	StreamRating
1	John Kupkova	johnkupkova@gmail.com	5/2/2015	4
2	Carlos Edwards	NA	5/29/2015	2
2	Carlos Edwards	NA	3/14/2015	3
3	Michael Eggerer	MichaelEgg@yahoo.com	9/14/2014	4.5
3	Michael Eggerer	MichaelEgg@yahoo.com	9/14/2014	4.5
3	Michael Eggerer	MichaelEgg@yahoo.com	6/16/2015	3.5
5	Doubi Xiao	ngdb@shabi.com	1/19/2015	5
8	Hougen Jiao	cuojiaohougen@126.com	12/3/2014	3.5
8	Hougen Jiao	cuojiaohougen@126.com	6/24/2015	5

This query uses an inner join to match a customer's name and email with the date of each of their streams and the rating they gave the stream. The information provided with this query paints a picture of how ratings have changed over time for each customer. If a customer's ratings are getting lower, this query also gives an email, so Netflix can get in touch with them and recommend some new content.

SELECT Content.ContentID, Content.Title, Streams.StreamDate, Streams.StreamTime
FROM Content LEFT JOIN Streams
ON Content.ContentID = Streams.ContentID;

ContentID	Title	StreamDate	StreamTime
100400298	Pulp Fiction	1/19/2015	6:59:00 PM
100400298	Pulp Fiction	6/24/2015	4:12:00 PM
100413299	Moonrise Kingdom	5/2/2015	11:48:00 PM
100413299	Moonrise Kingdom	12/3/2014	2:19:00 PM
200309400	House of Cards	5/29/2015	1:43:00 PM
200309400	House of Cards	9/14/2014	7:12:00 PM
200309401	House of Cards	9/14/2014	7:59:00 PM
200309402	House of Cards	3/14/2015	11:23:00 AM
200309402	House of Cards	6/16/2015	9:42:00 PM
200412638	Friends		

This query uses an outer join to show the Title of each stream, along with the content's ID, and the date and time of the stream. This query shows trends in stream time. This query (because it is an outer join) also notifies Netflix what content has yet to be streamed. This is important because Netflix does not want to pay for content that no one is watching.

```
SELECT C.CustomerName, Sum(Co.CostPerStream) AS TotalCost
    FROM Customer C, Content Co, Streams S
    WHERE C.CustomerID = S.CustomerID
    AND S.ContentID = Co.ContentID
    Group By C.CustomerName
    HAVING Sum(Co.CostPerStream) > 1.00;
```

CustomerName	TotalCost
Doubi Xiao	$1.19
Hougen Jiao	$2.08

By taking information from the customer and content tables, this query shows managers which customers are the most costly based on number of streams. Once the database is bigger, Netflix will be able to identify its most costly customers (on a large scale) and decide what to do with those customers. If a customer is costing Netflix more than he or she is worth, it may not be practical to keep that customer.

```
SELECT Co.Title, Co.Episode, AVG(S.StreamRating) AS AverageRating, Count(S.StreamID)
AS TotalStreams
    FROM Content Co, Streams S
    WHERE Co.ContentID = S.ContentID
    Group By Co.Episode, Co.Title;
```

Title	Episode	AverageRati	TotalStream
Moonrise Kingdom		3.75	2
Pulp Fiction		5	2
House of Cards	S1 E1	3.25	2
House of Cards	S1 E2	4.5	1
House of Cards	S1 E3	3.25	2

This query contains a calculation that identifies the average rating given to any particular content. It will show Netflix managers the performance of each piece of content in the company's database. Therefore, if one show or movie has an extremely low rating, the company may want to consider discontinuing that streaming option.

CREATE VIEW AllStreams as
Select *
From customerstreams;

CustomerID	CustomerName	CustomerEmail	StreamDate	StreamRatin
1	John Kupkova	johnkupkova@gmail.com	5/2/2015	4
2	Carlos Edwards	NA	5/29/2015	2
2	Carlos Edwards	NA	3/14/2015	3
3	Michael Eggerer	MichaelEgg@yahoo.com	9/14/2014	4.5
3	Michael Eggerer	MichaelEgg@yahoo.com	9/14/2014	4.5
3	Michael Eggerer	MichaelEgg@yahoo.com	6/16/2015	3.5
5	Doubi Xiao	ngdb@shabi.com	1/19/2015	5
8	Hougen Jiao	cuojiaohougen@126.com	12/3/2014	3.5
8	Hougen Jiao	cuojiaohougen@126.com	6/24/2015	5

This query creates a view of a previously mentioned query. The purpose of this view is to store, in one place, information from multiple tables: customer information and streaming information.