|  |  |  |  |
| --- | --- | --- | --- |
| Instructor |  | Due Date |  |

**PROJECT Data Modeling: Video Rental Application**

**Objective** To create a database application in MS Access, MySQL, SQL Server, DB2 or Oracle.

***PROJECT DESCRIPTION***

Consider the following snapshot of the business requirements that were ascertained from your systems exploration team upon their first meeting with the Video Store Rental Business, as given by the management of this brick and mortar video store named Avenue Video ( AV ) .

The business requirements information obtained from the client was then given to the database design team of your company.

Examine the properties that were proposed by the client and the exploration team and

create a database schema for this application by designing tables, table relationships and other diagrams as listed in the following instructions.

You could even normalize the initial attributes that were presented to your database department.

Then proceed to analyze the schema for information that can be useful to the business or enterprise.

**[ The Avenue Video Rental and Sales Store]**

**( Schema Objects - Customer and Inventory Data )**

|  |  |
| --- | --- |
|  | ***Customer Profile*** |
| ***Properties ( Attributes )*** | Customer Full Name |
|  | Customer Address |
|  | Rental Club Card |
|  | Home Store Location |
|  | Favorite Genre 1st choice |
|  | Favorite Genre 2nd choice |
|  | Number of Rentals |
|  | Current Rental(s) |

|  |  |
| --- | --- |
|  | ***Products / Inventory / Service Data*** |
| ***Properties ( Attributes )*** | DVD Movies for Rental |
|  | Accessories ( Headphones, Blank DVDs, etc. ) |
|  | Supplemental Items ( Candy, Popcorn, etc. ) |
|  | Item Cost |
|  | Rental Fee |

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**[ The Avenue Video Rental and Sales Store]**

**( Required Analytics )**

|  |  |
| --- | --- |
|  | **( Business Analytics )** |
| ***Actions ( Tasks )*** | What are the top ten genres of choice? |
|  | Who are the top ten customers? |
|  | What location has the highest number of customers? |
|  | What is the preferred method of paying? |
|  | What is the average number of rentals? |

# Information about this Project

This project requires you to create database objects and / or ERD models.

***Steps to Complete this Project***

**STEP 1 ( Examine the Business Requirements )**

Examine and review the above business requirements chart for the stated brick and mortar enterprise, which also has an online presence for its customers.

**STEP 2 ( Design the Tables )**

Create the structures / schemas for at least three tables related to this scenario. Assign key fields ( Primary and Foreign ) , and other relevant fields, each with their appropriate datatypes. Choose which fields should be not NULL ( as a constraint ) . You can add extra fields to your tables than those that are listed above. You may use either MS Access or Oracle SQL Developer to complete this project.

Populate each of the tables with fictional but adequate data. Include at least five records for each table. The table with the customer information should also include your name as one of the records.

Some Oracle sample, suggested tables follow within **Figure 1** of this project.

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**STEP 3 ( Generate the ERD Diagram )**

How would you relate the ( three ) tables? With your tables completed use MS Visio, MS Excel, MS Access, Oracle SQL Developer or similar database design tool to construct a relational diagram that shows the connection of your tables.

**STEP 4 ( Perform Analysis of the Data )**

Perform various analytical functions. Given the business requirements and analytics stated in **STEP 1** , construct and compose various queries that will display results that can be useful to the client’s enterprise.

**STEP 5 ( Present Your Design and Analysis for Submission )**

When your project is completed submit your database table structures and / or SQL code, your ERD diagram, your analytical queries together with their results.

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**Figure 1 Sample Entities with Sample Data**

**[ Movie Genres ]**

CREATE TABLE Genres

(

GenreID NUMBER(2) PRIMARY KEY,

GenreName VARCHAR2(20) NOT NULL UNIQUE

);

INSERT INTO Genres VALUES(1, 'Animation');

INSERT INTO Genres VALUES(2, 'Biography');

SELECT \* FROM Genres;

**[ Stores and Their Locations ]**

CREATE TABLE Stores

(

StoreID NUMBER(3) PRIMARY KEY,

Location VARCHAR2(30)

);

**PROJECT Data Modeling: Video Rental Application**

INSERT INTO Stores VALUES(1, 'Chicago North');

INSERT INTO Stores VALUES(2, 'Chicago South');

Select \* from Stores;

**[ Rental Customers ]**

CREATE TABLE Customers

(

CardNo NUMBER(6) PRIMARY KEY,

FName VARCHAR2 (30),

LName VARCHAR2 (30),

Genre1 VARCHAR2(20),

Genre2 VARCHAR2(20),

HomeStore NUMBER(3),

CONSTRAINT genre1\_fk FOREIGN KEY (Genre1)

REFERENCES Genres (GenreName),

CONSTRAINT genre2\_fk FOREIGN KEY (Genre2)

REFERENCES Genres (GenreName),

CONSTRAINT storehomeid\_fk FOREIGN KEY (HomeStore)

REFERENCES Stores(StoreID),

CONSTRAINT card\_check CHECK (LENGTH(CardNo) = 6)

);

INSERT INTO Customers VALUES(237186, 'Dave', 'Davies', 'Drama', 'Comedy', 1);

INSERT INTO Customers VALUES(731678, 'Linda', 'Davies', 'Comedy', 'Documentary', 2);

SELECT \* FROM Customers;

**[ Store Products ]**

CREATE TABLE Products (

ProdID VARCHAR2(15) PRIMARY KEY,

ProdCost NUMBER(7,2),

ProdName VARCHAR2(30),

ProdType VARCHAR2(1) CHECK (ProdType IN ('M', 'I')),

ProdInv NUMBER(4)

);

INSERT INTO PRODUCTS VALUES (101, 8.99, 'Star Wars: Force Awakens', 'M', 9);

INSERT INTO PRODUCTS VALUES (102, 20.99, 'Gone with the Wind', 'M', 3);

SELECT \* FROM Products;

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**[ Movies ]**

CREATE TABLE Movies

(

ProdID VARCHAR2(15) PRIMARY KEY,

MovieYear NUMBER(4),

MovieGenreID NUMBER(2),

CONSTRAINT genre\_fk FOREIGN KEY (MovieGenreID)

REFERENCES Genres (GenreID),

CONSTRAINT ProdID FOREIGN KEY (ProdID)

REFERENCES PRODUCTS (ProdID)

);

INSERT INTO MOVIES VALUES (101, 2015, 1);

INSERT INTO MOVIES VALUES (102, 1977, 2);

SELECT \* FROM Movies;

**[ Inventory Items ]**

CREATE TABLE Items

(

ProdID VARCHAR2(15) PRIMARY KEY,

ItemName VARCHAR2(25),

ItemPartNo VARCHAR2(20),

CONSTRAINT prod\_id\_fk FOREIGN KEY (ProdID)

REFERENCES Products (ProdID)

);

INSERT INTO Items VALUES ('104', 'Beats by Dr. Dre', 'XY345');

INSERT INTO ITEMS VALUES ('111', 'RockStar Games', 'RD-45-2017');

SELECT \* FROM Items;

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**[ Orders ]**

CREATE TABLE AV\_Orders

(

Order\_ID NUMBER(4) PRIMARY KEY,

CardNo NUMBER(6),

PMT\_Method VARCHAR2(10) CONSTRAINT pmt\_check

CHECK (PMT\_Method IN ('CASH', 'CHECK', 'CREDIT')),

Order\_Date DATE,

CONSTRAINT card#\_fk FOREIGN KEY (CardNo)

REFERENCES Customers (CardNo)

);

INSERT INTO AV\_ORDERS VALUES (1001, 257481, 'CREDIT', '05-APR-2021');

INSERT INTO AV\_ORDERS VALUES (1002, 100011, 'CHECK', '24-DEC-2021');

SELECT \* FROM AV\_ORDERS;

**[ Order Invoices ]**

CREATE TABLE Order\_Invoice

(

Order\_ID NUMBER(4),

LineNo NUMBER(2),

ProdID VARCHAR2(15),

QTY NUMBER(3),

CONSTRAINT order\_line\_invoice\_pk PRIMARY KEY(Order\_ID, LineNo),

CONSTRAINT order\_id\_invoice\_fk FOREIGN KEY (Order\_ID)

REFERENCES AV\_ORDERS (Order\_ID),

CONSTRAINT prod\_id\_invoice\_fk FOREIGN KEY (ProdID)

REFERENCES PRODUCTS (ProdID)

);

INSERT INTO ORDER\_INVOICE VALUES (1000,1,'104', 1);

INSERT INTO ORDER\_INVOICE VALUES (1001,1,'101', 2);

SELECT \* FROM Order\_Invoice;

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**[ Sample Query 1 ]**

SELECT ROWNUM, genrename

FROM

(

SELECT g.genrename

FROM order\_invoice oi INNER JOIN Movies m

ON oi.prodid = m.prodid

JOIN genres g

ON m.moviegenreid = g.genreid

ORDER BY g.genrename

)

WHERE ROWNUM <= 10;

**[ Sample Query 2 ]**

-- query to identify top customers

SELECT Customers.CARDNO, Count(\*) FROM Customers

LEFT JOIN AV\_Orders ON Customers.CARDNO = AV\_Orders.CARDNO

Group By (Customers.CARDNO)

Order By Count(\*) desc;

**PROJECT Data Modeling: Questions**

**STEP 1** **Questions and Reflections Concerning this Database Project**

Now that you have completed this lab project, review the questions below to reflect on the procedures and settings that you utilized as you followed the steps to complete the project. Place your responses in your lab submittal document.

**(1)** What are the five constraints that Oracle SQL supports for table construction?

**(2)** Explain the importance of generating an ERD diagram.

**(3)** How many join conditions are needed to join four tables?

**(4)** The last query in this lab involves top - n analysis. Define top - n analysis and the ROWNUM identifier.

**(5)** How are analytical functions helpful in providing business information?