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| --- | --- |
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| Tutor: | Ms Liz Wang |
| Deadline: | 26 Dec 2021 |

ITB421 Data STORAGE ADMINISTRATION

Assignment

Physical Data Modelling

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# Part 1: Defining Database Structure and Objects using Database Definition Language (DDL) for OraRental database (20 marks)

**Task 1: Develop DDL statements for creating the tables in the OraRental database**

**Task 2: Creating and Managing Constraints**

**[ Task 1 and Task 2 done together ]**

Creating Tables

|  |  |
| --- | --- |
| Table Name | Command |
| orarent\_customers | * CREATE TABLE orarent\_customers   (customer\_id NUMBER(10) CONSTRAINT ctm\_id\_nn  NOT NULL CONSTRAINT ctm\_id\_pk PRIMARY KEY,  last\_name VARCHAR2(25) CONSTRAINT l\_name\_nn NOT NULL,  first\_name VARCHAR2(25) CONSTRAINT f\_name\_nn NOT NULL,  home\_phone VARCHAR2(12) CONSTRAINT h\_ph\_nn NOT NULL,  address VARCHAR2(100) CONSTRAINT addrs\_nn NOT NULL,  city VARCHAR2(30) CONSTRAINT city\_nn NOT NULL,  state VARCHAR2(2) CONSTRAINT state\_nn NOT NULL,  email VARCHAR2(25),  cell\_phone VARCHAR2(12)); |
| orarent\_movies | * CREATE TABLE orarent\_movies   (title\_id NUMBER(10) CONSTRAINT mv\_title\_id\_nn NOT NULL CONSTRAINT mv\_title\_id\_pk PRIMARY KEY,  title VARCHAR2(60) CONSTRAINT mv\_title\_nn NOT NULL,  description VARCHAR2(400) CONSTRAINT mv\_desc\_nn NOT NULL,  rating VARCHAR2(4) CONSTRAINT mv\_rt\_ck CHECK(UPPER(rating) IN ('G','PG','PG13','R')),  category VARCHAR2(20) CONSTRAINT mv\_ctg\_ck CHECK(UPPER(category) IN ('DRAMA', 'COMEDY', 'ACTION', 'CHILD', 'SCIFI', 'DOCUMENTARY')),  release\_date DATE CONSTRAINT mv\_r\_date\_nn NOT NULL); |
| orarent\_media | * CREATE TABLE orarent\_media (   media\_id NUMBER(10) CONSTRAINT md\_id\_nn NOT NULL CONSTRAINT md\_id\_pk PRIMARY KEY,  format VARCHAR2(3) CONSTRAINT md\_fr\_nn NOT NULL,  title\_id NUMBER(10) CONSTRAINT md\_title\_id\_nn NOT NULL CONSTRAINT md\_title\_id\_fk REFERENCES orarent\_movies(title\_id)); |
| orarent\_rental\_history | * CREATE TABLE orarent\_rental\_history(   media\_id NUMBER(10) CONSTRAINT rtl\_hty\_md\_id NOT NULL CONSTRAINT rtl\_hty\_media\_id\_fk1 REFERENCES orarent\_media(media\_id) ,  rental\_date DATE DEFAULT SYSDATE CONSTRAINT rtl\_hty\_date\_nn NOT NULL,  customer\_id NUMBER(10) CONSTRAINT rtl\_hty\_ctm\_id\_nn NOT NULL ,  return\_date DATE,  CONSTRAINT rtl\_hty\_ctm\_id\_fk2 FOREIGN KEY (customer\_id) REFERENCES orarent\_customers(customer\_id),  CONSTRAINT rtl\_hty\_md\_id\_rtl\_date\_pk PRIMARY KEY (media\_id, rental\_date)); |
| orarent\_actors | * CREATE TABLE orarent\_actors(   actor\_id NUMBER(10) CONSTRAINT act\_id\_nn NOT NULL,  stage\_name VARCHAR2(40) CONSTRAINT stg\_name\_nn NOT NULL,  first\_name VARCHAR2(25) CONSTRAINT act\_f\_name\_nn NOT NULL,  last\_name VARCHAR2(25) CONSTRAINT act\_l\_name\_nn NOT NULL,  birth\_date DATE CONSTRAINT b\_date\_nn NOT NULL,  CONSTRAINT act\_id\_pk PRIMARY KEY(actor\_id)); |
| orarent\_star\_billings | * CREATE TABLE orarent\_star\_billings(   actor\_id NUMBER(10) CONSTRAINT st\_blg\_act\_id\_nn NOT NULL CONSTRAINT st\_blg\_act\_id\_fk REFERENCES orarent\_actors(actor\_id) ,  title\_id NUMBER(10) CONSTRAINT st\_blg\_title\_id\_nn NOT NULL CONSTRAINT st\_blg\_title\_id\_fk REFERENCES orarent\_movies(title\_id) ,  comments VARCHAR2(40),  CONSTRAINT st\_blg\_act\_id\_title\_id\_pk PRIMARY KEY (actor\_id, title\_id)); |
| Short Name | ctm = customers  mv = movie  md = media  rtl = rental  rtl\_hty = rental history  act = actors  stt\_blg = start\_billings  nn = not null  fk = foreign key  pk = primary key |

**Run queries from the data dictionaries for the above constraints**

|  |  |
| --- | --- |
| Data Directory | SELECT \* FROM user\_constraints  WHERE table\_name LIKE 'ORARENT%'; |

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Graphical user interface, application

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**Task 3: Creating and Managing Views**

Create a view called TITLE\_UNAVAIL to show the movie titles and media\_id of the media not returned yet. The view should not allow any DML operations.

**Ans:**

CREATE OR REPLACE VIEW TITLE\_UNAVAIL ("Movie Titles", "Media ID")AS

SELECT title, media\_id

FROM orarent\_movies JOIN orarent\_media USING (title\_id) JOIN orarent\_rental\_history USING (media\_id)

WHERE return\_date > SYSDATE

WITH READ ONLY;

**Result of TITLE\_UNAVAIL**

SELECT \* FROM TITLE\_UNAVAIL;

A picture containing table

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**Task 4: Working with Sequences (Indexes and Synonyms)**

1. Create the following sequences to be used for primary key values:

CREATE SEQUENCE ora\_ctm\_pk

INCREMENT BY 1

START WITH 101

MAXVALUE 200

NOCACHE

NOCYCLE;

CREATE SEQUENCE ora\_mov\_pk

INCREMENT BY 1

START WITH 1

MAXVALUE 50

NOCACHE

NOCYCLE;

CREATE SEQUENCE ora\_med\_pk

INCREMENT BY 1

START WITH 92

MAXVALUE 200

NOCACHE

NOCYCLE;

CREATE SEQUENCE ora\_act\_pk

INCREMENT BY 1

START WITH 1001

MAXVALUE 2000

NOCACHE

NOCYCLE;

1. Add the data to the tables using INSERT statements. Be sure to use the sequences for the PKs.

**Inserting Data to Tables**

|  |  |
| --- | --- |
| Table Name | Command |
| orarent\_customers | * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'Palombo', 'Lisa', '716-270-2669', '123 Main Street, Block 73D #5-217', 'Buffalo', 'NY', 'palombo@ecc.edu',  '716-555-1212')   * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'Barack', 'Obama', '716-273-1987', '1600 Pennsylvania Avenue', 'Washington D.C', 'DC', 'obama4president@gmail.com', '716-527-9989')   * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'Gaga', 'Lady', '716-143-2798', '30460 Morning View Drive Malibu, CA 90265', 'Malibu', 'CA', 'badromance@heartbreak.com', '716-696-9969')   * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'Idol', 'Super', '716-299-9126', '108 Chinatown, Block D77', 'Hawaii', 'HI', 'xiaorong@socialcredit.com', '716-123-4567')   * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'The Rock', 'Dwayne', '716-313-5567', '556 Doris Rd', 'El Paso', 'TX', 'drive&power@gym.com', '716-321-7654')   * INSERT INTO ORARENT\_CUSTOMERS VALUES   (ora\_ctm\_pk.NEXTVAL,'Strange', 'Doctor', '716-000-9090', '116 Infinity Stone Rd', 'Marvel', 'MU', 'imanerd@magic.com', '716-444-6678') |
| orarent\_movies | * INSERT INTO ORARENT\_MOVIES VALUES   (ora\_mov\_pk.NEXTVAL, 'Remember the Titans', 'The true story of a newly appointed African-American coach and his high school team on their first season as a racially integrated unit.', 'PG', 'DRAMA', '29-SEP-2000')   * INSERT INTO ORARENT\_MOVIES VALUES (ora\_mov\_pk.NEXTVAL, 'Spider-Man: No Way Home', 'With Spider-Man''s identity now revealed, Peter asks Doctor Strange for help. When a spell goes wrong, dangerous foes from other worlds start to appear, forcing Peter to discover what it truly means to be Spider-Man', 'PG13', 'ACTION', '17-DEC-2021'); * INSERT INTO ORARENT\_MOVIES VALUES (ora\_mov\_pk.NEXTVAL, 'The Matrix Resurrections', 'Return to a world of two realities: one, everyday life; the other, what lies behind it. To find out if his reality is a construct, to truly know himself, Mr. Anderson will have to choose to follow the white rabbit once more.', 'R', 'SCIFI', '22-Dec-2021'); * INSERT INTO ORARENT\_MOVIES VALUES (ora\_mov\_pk.NEXTVAL, 'West Side Story', 'An adaptation of the 1957 musical, West Side Story explores forbidden love and the rivalry between the Jets and the Sharks, two teenage street gangs of different ethnic backgrounds.', 'PG13', 'DRAMA', '10-Dec-2021'); * INSERT INTO ORARENT\_MOVIES VALUES (ora\_mov\_pk.NEXTVAL, 'House of Gucci', 'House of Gucci is inspired by the family empire behind the Italian fashion house of Gucci. When Patrizia Reggiani (Lady Gaga), an outsider from humble beginnings, marries into the Gucci family, her unbridled ambition begins to unravel the family legacy and triggers a reckless spiral of betrayal, decadence, revenge, and ultimately...murder.', 'R', 'DRAMA', '24-Nov-2021'); * INSERT INTO ORARENT\_MOVIES VALUES (ora\_mov\_pk.NEXTVAL, 'The Last Duel', 'Based on the true story of France''s last trial by combat in the Middle Ages. Knight Jean de Carrouges challenges his former friend Jacques Le Gris to a duel after Jean''s wife Marguerite accuses Le Gris of rape. Told in multiple "Rashomon-style" points of view.', 'R', 'ACTION', '15-Oct-2021'); |
| orarent\_media | * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'DVD', 1); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'VHS', 1); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'DVD', 2); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'DVD', 3); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'VHS', 3); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'VHS', 4); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'DVD', 5); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'DVD', 6); * INSERT INTO ORARENT\_MEDIA VALUES(ora\_med\_pk.NEXTVAL, 'MP4', 6); |
| orarent\_rental\_history | * INSERT INTO orarent\_rental\_history VALUES(96, DEFAULT, 104,'02-MAR-2022'); * INSERT INTO orarent\_rental\_history VALUES(92, '19-SEP-2010', 101,'20-SEP-2010'); * INSERT INTO orarent\_rental\_history VALUES(93, '01-JUN-2011', 106,'01-JUL-2011'); * INSERT INTO orarent\_rental\_history VALUES(95, '15-APR-2011', 105,'19-MAY-2011'); * INSERT INTO orarent\_rental\_history VALUES(98, '08-APR-2017', 102,'30-AUG-2017'); |
| orarent\_actors | * INSERT INTO orarent\_actors VALUES(ora\_act\_pk.NEXTVAL, 'Brad Pitt', 'William', 'Pitt', '18-DEC-1963'); * INSERT INTO orarent\_actors VALUES(ora\_act\_pk.NEXTVAL, 'Doctor Strange', 'Benedict', 'Cumberbatch', '19-JUL-1976'); * INSERT INTO orarent\_actors VALUES(ora\_act\_pk.NEXTVAL, 'Orange', 'Donald', 'Trump', '19-JUN-1946'); * INSERT INTO orarent\_actors VALUES(ora\_act\_pk.NEXTVAL, 'MahJong', 'Joe', 'Maama', '21-Nov-1969'); * INSERT INTO orarent\_actors VALUES(ora\_act\_pk.NEXTVAL, 'Doja Cat', 'Amala', 'Ratna', '21-Oct-1995'); |
| orarent\_star\_billings | * INSERT INTO orarent\_star\_billings VALUES(1001, 2, 'Romantic Lead'); * INSERT INTO orarent\_star\_billings VALUES(1002, 1, 'Inspiring Coach'); * INSERT INTO orarent\_star\_billings VALUES(1003, 4, 'Outstanding Acting'); * INSERT INTO orarent\_star\_billings VALUES(1004, 3, 'Profound Acting'); * INSERT INTO orarent\_star\_billings VALUES(1005, 5, 'Purr~fect Acting'); |

1. Create an index on the last\_name column of the Customers table

**Ans:**

CREATE INDEX ctm\_last\_name\_index

on orarent\_customers(last\_name);

Create a synonym called TU for the TITLE\_UNAVAIL view.

**Ans:**

CREATE SYNONYM TU

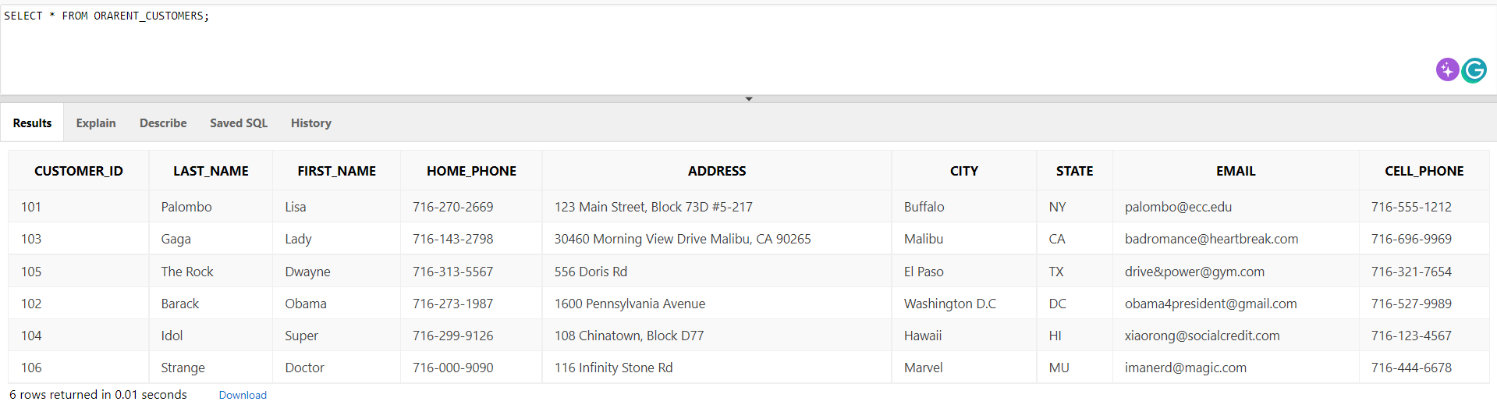
FOR title\_unavail;

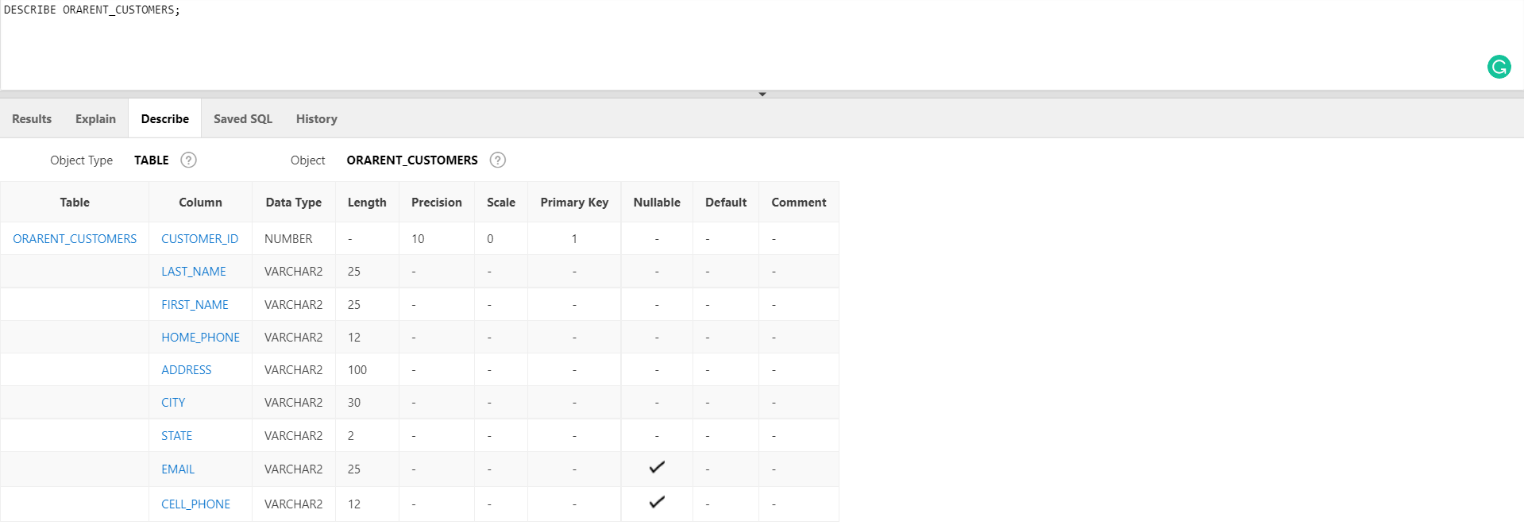
**Result for Synonym called TU**

A picture containing chart

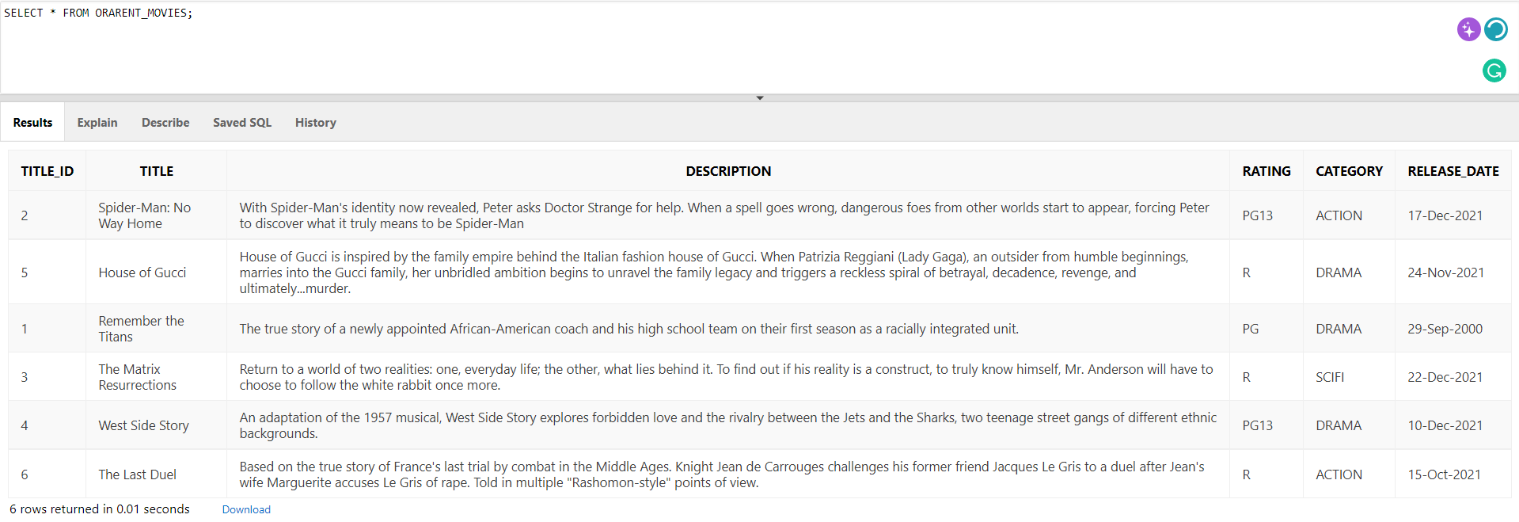
Description automatically generatedSELECT \* FROM TU;

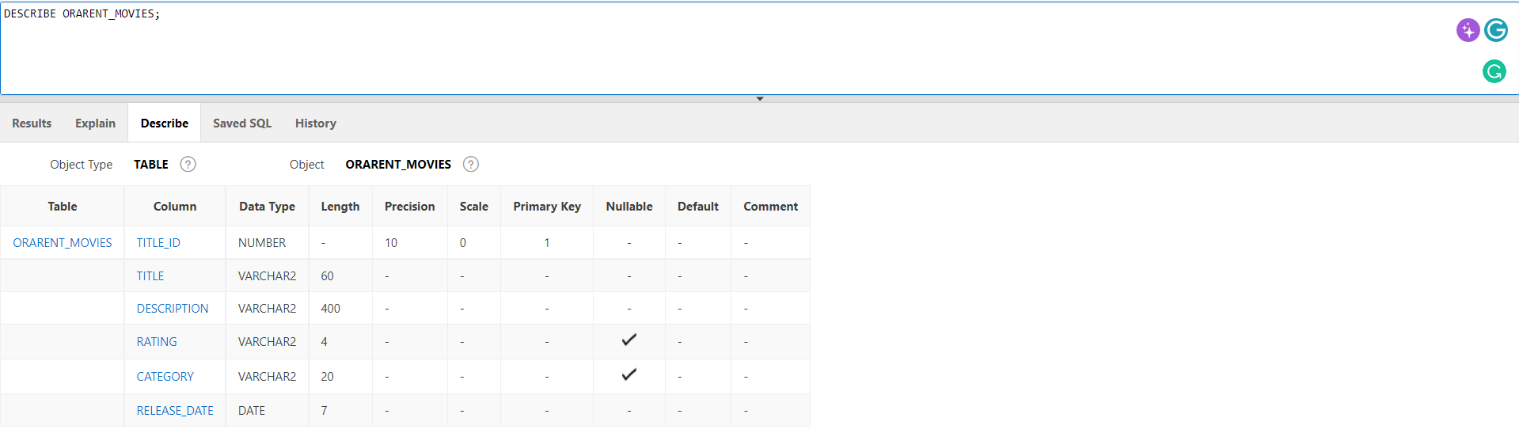
Sample Data for **ORARENT\_CUSTOMERS**



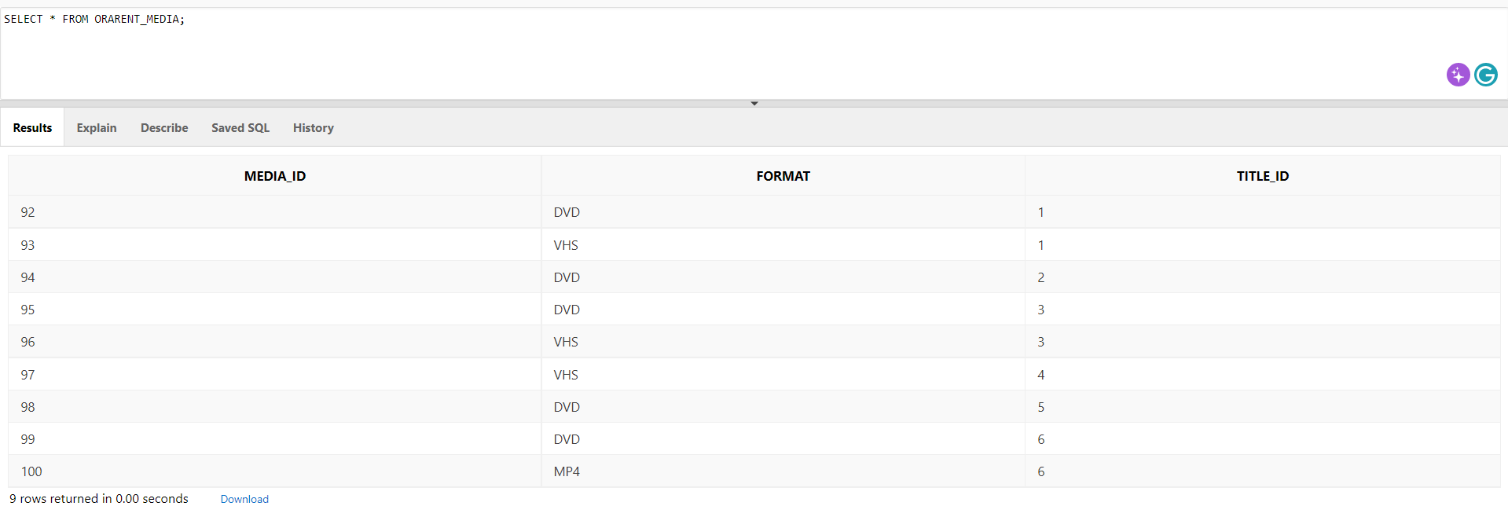


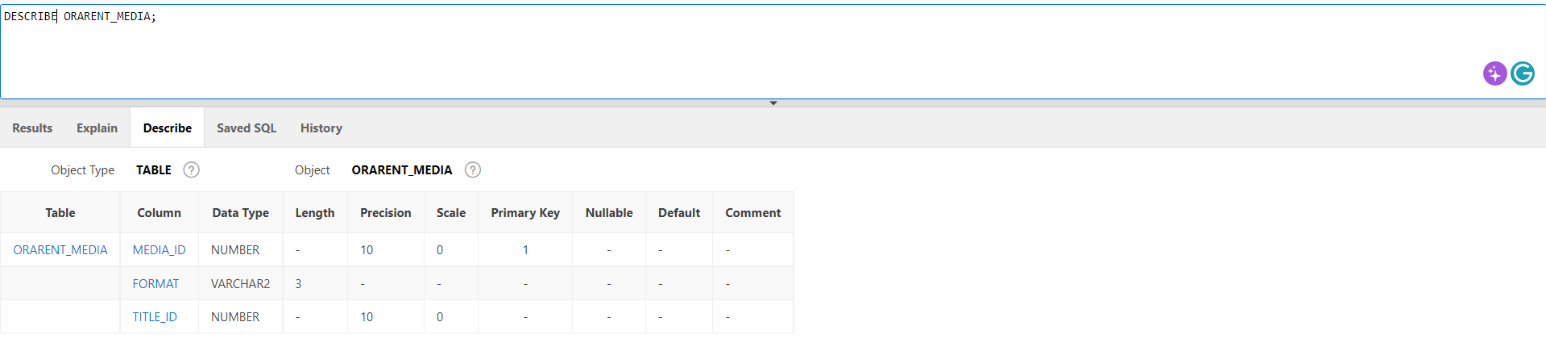
Sample Data for **ORARENT\_MOVIES**



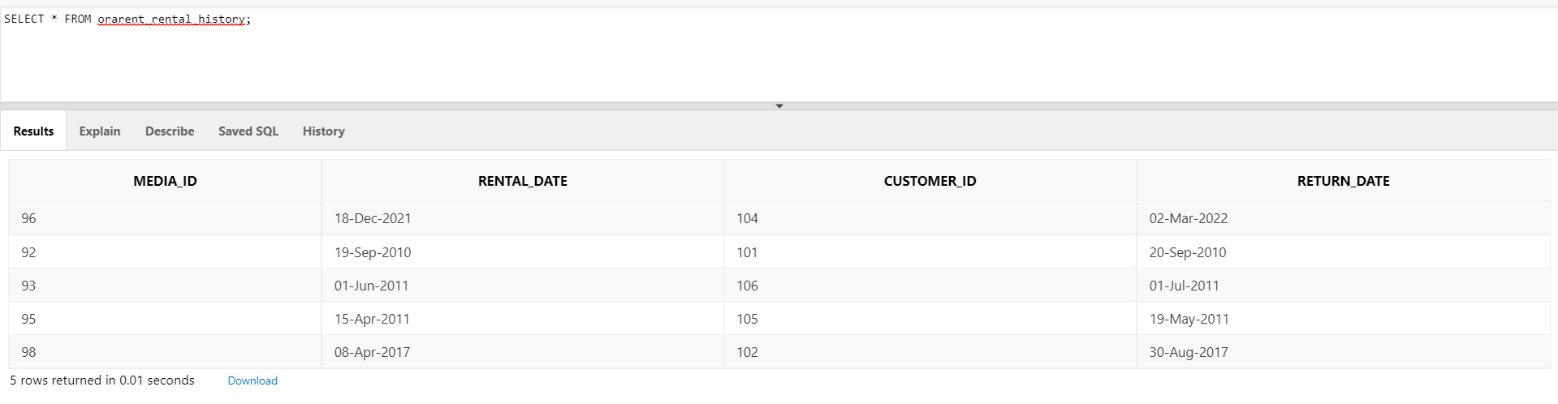


Sample Data for **ORARENT\_MEDIA**





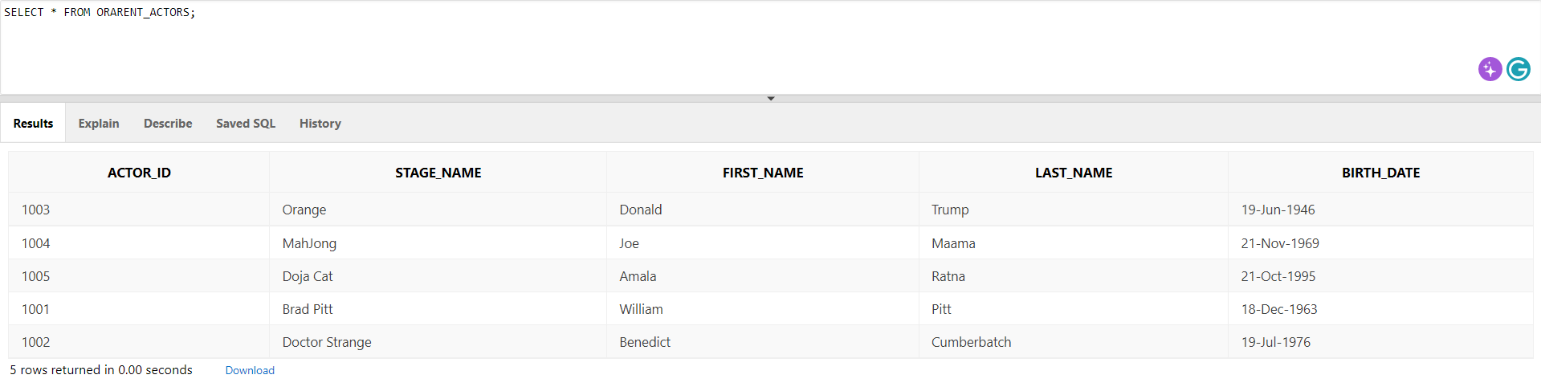
Sample Data for **ORARENT\_RENTAL\_HISTORY**

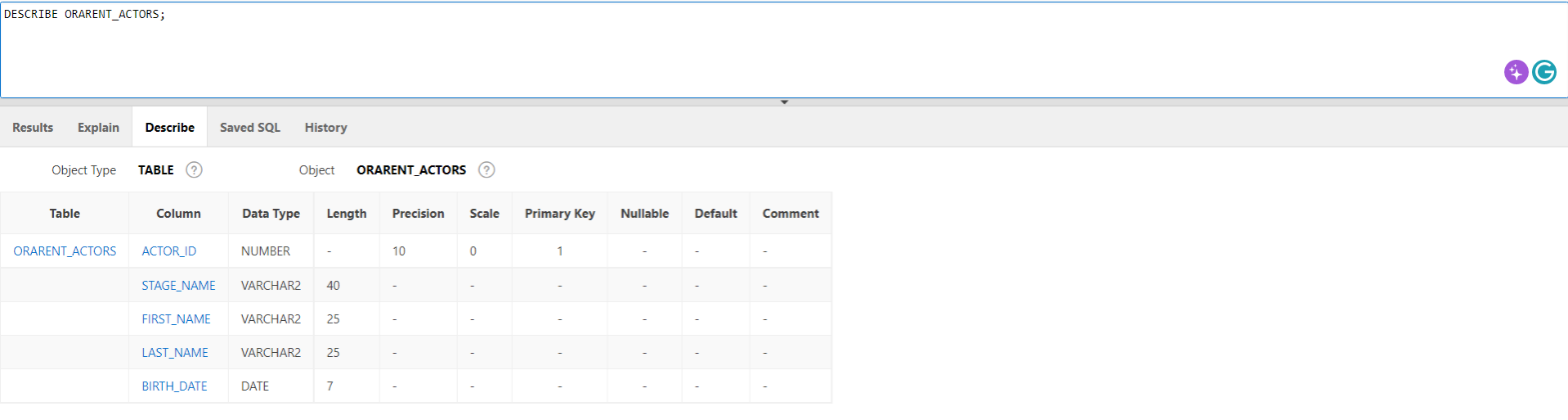


Graphical user interface, application, table

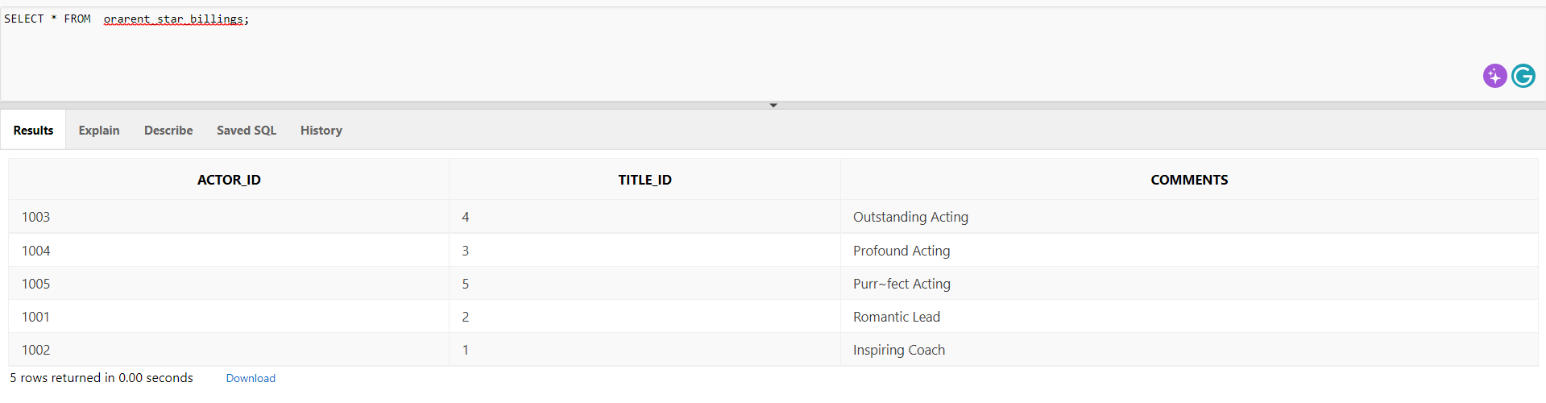
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Sample Data for **ORARENT\_ACTORS**





Sample Data for **ORARENT\_STAR\_BILLINGS**



Graphical user interface, application

Description automatically generated

# Part 2: Perform data retrieval and manipulation tasks specified in the email correspondences with users (20 marks)

1. List of the SQL statements executed by the team. For each request, please indicate the team member who responded to it.

|  |  |  |
| --- | --- | --- |
| **Name** | **Script** | **Task** |
| Bo Yu | **Request 1**  **UPDATE HWL\_EMPLOYEES**  **SET EMAIL ='ellis.washington@oracle.com', MANAGER\_ID = 1**  **WHERE FIRST\_NAME= 'Ellis';**  **SELECT**  **EMPLOYEE\_ID,FIRST\_NAME,LAST\_NAME,EMAIL,MANAGER\_ID FROM HWL\_EMPLOYEES**  **WHERE FIRST\_NAME = 'Ellis';** | Request 1  Update the email address of the employee “Ellis Washington” to ellis.washington@oracle.com |
| Bo Yu | **Request 2**  **SELECT e.FIRST\_NAME AS "First Name", e.LAST\_NAME AS "Last Name", LPAD(SUBSTR(e.NRIC,6,5),9,'\*') AS "NRIC", e.HIRE\_DATE AS "Hire Date", m.FIRST\_NAME||' '|| m.LAST\_NAME AS "Manager Name"**  **FROM HWL\_EMPLOYEES e**  **LEFT OUTER JOIN HWL\_EMPLOYEES m**  **ON (e.MANAGER\_ID = m.EMPLOYEE\_ID)**  **WHERE e.JOB\_TITLE = 'Stock Clerk';** | Request 2  Retrieve the list of our employees whose job title is Stock Clerk. The data column in the report should be displayed in this sequence, First Name, Last Name, NRIC, Hire Date and Manager Name. |
| Vicknesh | **Request 1**  **UPDATE HWL\_CUSTOMERS**  **SET CREDIT\_LIMIT=7000**  **WHERE  ADDRESS  LIKE '%Wisconsin%';**  **SELECT CUSTOMER\_ID AS "Customer ID", NAME AS "Customer Name", ADDRESS AS "Address", WEBSITE AS "Website", CREDIT\_LIMIT AS "Credit Limit (USD)"**  **FROM HWL\_CUSTOMERS**  **WHERE  ADDRESS  LIKE '%Wisconsin%';** | Request 1  Update the credit limit of all the customers located in Wisconsin (WI) to USD 7000. |
| Vicknesh | **Request 2**  **SELECT CUSTOMER\_ID AS "Customer ID", NAME AS "Customer Name", ADDRESS AS "Address", CREDIT\_LIMIT AS "Credit Limit (USD)", FIRST\_NAME AS "First Name", LAST\_NAME AS "Last Name"**  **FROM HWL\_CUSTOMERS JOIN HWL\_CONTACTS USING (CUSTOMER\_ID)**  **WHERE CUSTOMER\_ID**  **BETWEEN 140 AND 155**  **ORDER BY CUSTOMER\_ID;BETWEEN 140 AND 155**  **ORDER BY CUSTOMER\_ID,NAME,ADDRESS,CREDIT\_LIMIT,FIRST\_NAME,**  **LAST\_NAME,PASSWORD;** | Request 2  Retrieve the list of customers and their contact details with customer id between 140 to 155. The data column in the report should be displayed in this sequence, Customer ID, Customer Name, Address, Credit Limit, First Name, Last Name and Password.  (Address & Password sensitive information, can’t be sent via Email) |
| Sam | **Request 1**  **UPDATE HWL\_INVENTORIES**  **SET QUANTITY = 50**  **WHERE WAREHOUSE\_ID = 9 AND PRODUCT\_ID = 137;** | Request 1  Update the inventory quantity of Asus Z10PE-D16 WS in Bombay warehouse to 50. |
| Sam | **Request 2**  **SELECT ORDER\_ID AS "Order Number", COUNT(QUANTITY) AS "Single/Multiple Time Orders"**  **FROM HWL\_ORDER\_ITEMS**  **WHERE QUANTITY < 200**  **GROUP BY ORDER\_ID**  **HAVING COUNT(QUANTITY) = 1**  **ORDER BY ORDER\_ID;** | Request 2  Retrieve the list of Order IDs with less than 200 items purchased in a single order. |
| Mark | **Request 1**  **UPDATE HWL\_EMPLOYEES**  **SET JOB\_TITLE = 'Sales Manager', MANAGER\_ID = (SELECT EMPLOYEE\_ID FROM HWL\_EMPLOYEES WHERE FIRST\_NAME = 'Tommy')**  **WHERE FIRST\_NAME = 'Lily';**  **SELECT EMPLOYEE\_ID, FIRST\_NAME || ' ' || LAST\_NAME AS "Full Name", MANAGER\_ID, JOB\_TITLE**  **FROM HWL\_EMPLOYEES**  **WHERE EMPLOYEE\_ID IN (54,1);** | Request 1  Lily Fisher has been promoted to Sales Manager and reporting to Tommy Bailey, please update her job title and manager in the database accordingly. |
| Mark | **Request 2**  **SELECT E.FIRST\_NAME AS "First Name", E.LAST\_NAME AS "Last Name", E.HIRE\_DATE AS "Hire Date", LPAD(SUBSTR(E.NRIC,6,5),9,'\*') AS NRIC, CONCAT(M.FIRST\_NAME || ' ', M.LAST\_NAME) AS "Manager Name"**  **FROM HWL\_EMPLOYEES E JOIN HWL\_EMPLOYEES M ON (E.MANAGER\_ID = M.EMPLOYEE\_ID)**  **WHERE E.JOB\_TITLE = 'Stock Clerk';** | Request 2  Retrieve the list of our employees whose job title is Stock Clerk. The data column in the report should be displayed in this sequence, First Name, Last Name, Hire Date, the last four digit of NRIC and Manager Name. |