

CSCI 331

PROJECT 3

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CSCI 331

Project 3: NASA SPACE EXPLORATION DATABASE

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SOURCE CODE FOR TABLE'S:

```
CREATE TABLE astronaut_info (  
  astronaut_id    NUMBER PRIMARY KEY,  
  astronaut_fname VARCHAR2(20) NOT NULL,  
  astronaut_lname VARCHAR2(20) NOT NULL,  
  astronaut_dob   DATE NOT NULL,  
  astronaut_country VARCHAR2(20) NOT NULL,  
  astronaut_gender CHAR(1)  
)
```

```
CREATE TABLE astronaut_spouse_info (  
  astronaut_spouse_id  NUMBER PRIMARY KEY,  
  astronaut_spouse_name VARCHAR(30) NOT NULL,  
  astronaut_id         NUMBER,  
  FOREIGN KEY ( astronaut_id )  
  REFERENCES astronaut_info ( astronaut_id )  
  ON DELETE CASCADE  
)
```

```
CREATE TABLE astronaut_child_info (  
  astronaut_child_id  NUMBER PRIMARY KEY,  
  astronaut_child_name VARCHAR(30) NOT NULL,  
  astronaut_id        NUMBER,  
  FOREIGN KEY ( astronaut_id )  
  REFERENCES astronaut_info ( astronaut_id )  
  ON DELETE CASCADE  
)
```

```
CREATE TABLE space_ship_info (  
  space_ship_id  NUMBER PRIMARY KEY,  
  space_ship_name VARCHAR(30)  
)
```

```
CREATE TABLE mission_info (  
  mission_id  NUMBER PRIMARY KEY,  
  mission_name VARCHAR(30) NOT NULL,  
  mission_destination VARCHAR2(30) not null,  
  mission_objective_id NUMBER,  
  mission_distance float not null,  
  space_ship_id NUMBER,
```

```
FOREIGN KEY ( space_ship_id )  
REFERENCES space_ship_info ( space_ship_id ),
```

```
FOREIGN KEY ( mission_objective_id )
```

```
REFERENCES mission_objective_info ( mission_objective_id )  
ON DELETE CASCADE  
)
```

```
CREATE TABLE astronaut_education_info (  
astronaut_education_id    NUMBER PRIMARY KEY,  
university_id NUMBER,  
degree_id NUMBER,  
astronaut_id      NUMBER,  
FOREIGN KEY ( astronaut_id )  
REFERENCES astronaut_info ( astronaut_id )  
ON DELETE CASCADE,  
FOREIGN KEY ( degree_id )  
REFERENCES degree_info ( degree_id )  
ON DELETE CASCADE,  
FOREIGN KEY ( university_id )  
REFERENCES university_info ( university_id )  
ON DELETE CASCADE  
)
```

```
CREATE TABLE mission_objective_info (  
mission_objective_id    NUMBER PRIMARY KEY,  
mission_objective_name  VARCHAR(30) NOT NULL  
)
```

```
CREATE TABLE mission_launch_info (  
mission_launch_id      NUMBER PRIMARY KEY,  
mission_id             NUMBER,  
mission_launch_date    DATE NOT NULL,  
mission_site_id number    not null,  
FOREIGN KEY ( mission_site_id )  
REFERENCES mission_site_info ( mission_site_id ),  
FOREIGN KEY ( mission_id )  
REFERENCES mission_info ( mission_id )  
ON DELETE CASCADE  
)
```

```
CREATE TABLE mission_land_info (  
mission_land_id        NUMBER PRIMARY KEY,  
mission_id             NUMBER,  
mission_land_date      DATE NOT NULL,  
mission_landing_site_id number,  
FOREIGN KEY ( mission_landing_site_id )  
REFERENCES mission_landing_site( mission_landing_site_id ),  
FOREIGN KEY ( mission_id )  
REFERENCES mission_info ( mission_id )  
ON DELETE CASCADE  
);
```

```
CREATE TABLE mission_details (  
mission_details_id NUMBER PRIMARY KEY,  
mission_id NUMBER,  
astronaut_id NUMBER,  
FOREIGN KEY ( astronaut_id )  
REFERENCES astronaut_info ( astronaut_id ),  
FOREIGN KEY ( mission_id )  
REFERENCES mission_info ( mission_id )  
ON DELETE CASCADE  
)
```

```
CREATE TABLE mission_site_info (  
mission_site_id NUMBER PRIMARY KEY,  
mission_site_name VARCHAR(40) NOT NULL,  
mission_site_city VARCHAR(40) NOT NULL,  
mission_site_state VARCHAR(10),  
mission_site_country VARCHAR(20) NOT NULL  
)
```

```
CREATE TABLE mission_landing_site (  
mission_landing_site_id NUMBER PRIMARY KEY,  
mission_landing_site_name VARCHAR2(50) NOT NULL,  
mission_landing_site_city VARCHAR2(50) NOT NULL,  
mission_landing_site_state VARCHAR2(50) NOT NULL,  
mission_landing_site_country VARCHAR2(50) NOT NULL  
)
```

```
CREATE TABLE degree_info(  
degree_id NUMBER PRIMARY KEY,  
degree_name VARCHAR2(30) NOT NULL  
)
```

```
CREATE TABLE university_info(  
university_id NUMBER PRIMARY KEY,  
university_name VARCHAR2(30) NOT NULL  
)
```

SEQUENCE FOR ASTRONAUTS ID:

```
CREATE SEQUENCE counter  
START WITH 1  
INCREMENT BY 1  
MAXVALUE 100
```

MINVALUE 1
CACHE 100
ORDER;

DATA INSERTION:

ASTRONAUT INFO

```
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Joseph', 'Acaba', '12/12/1967', 'USA', 'M')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Loren', 'Acton', '09/12/1936', 'USA', 'M')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Mike', 'Adams', '09/10/1948', 'USA', 'M')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Viktor', 'Adanasyev', '09/07/1951', 'RUSSIA', 'M')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Aleksandr', 'Aleksandrov', '09/07/1952', 'BULGARIA', 'M')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Sally', 'Ride', '12/12/1951', 'USA', 'F')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Valentina', 'Tereshkova', '12/12/1951', 'Russia', 'F')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Eileen', 'Collins', '12/12/1956', 'USA', 'F')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Judith', 'Resnik', '12/12/1949', 'USA', 'F')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Shannon', 'Lucid', '12/2/1943', 'USA', 'F')
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob,
astronaut_country, astronaut_gender)
values (counter.nextval, 'Optimus', 'Prime', '12/2/1987', 'USA', 'M')
```

ASTRONAUT CHILD INFO

```
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (1, 'Joseph Bacaba', 1)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (2, 'Joseph Cacaba', 1)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
```

```
values (3, 'Loren Acton', 2)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (4, 'Aleksandr Bleeksandrov Jr', 5)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (5, 'Aleksandr Cleeksandrov Jr', 5)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (6, 'Valentina Pareschkova', 7)
insert into ASTRONAUT_CHILD_INFO(astronaut_child_id, astronaut_child_name, astronaut_id)
values (7, 'Eileen Farel', 9)
```

ASTRONAUT SPOUSE INFO

```
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (1, 'Merry Copper', 3)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (2, 'Johanna Smith', 4)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (3, 'Alexendra Chevanov', 5)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (4, 'Mila Kunis', 1)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (5, 'Aston Kutcher', 10)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (6, 'Tom Cruse', 8)
insert into ASTRONAUT_SPOUSE_INFO(ASTRONAUT_SPOUSE_ID,
ASTRONAUT_SPOUSE_NAME, astronaut_id)
values (7, 'Bradly Coper', 6)
```

SPACE SHIP INFO

```
insert into space_ship_info(space_ship_id, space_ship_name)
values (1, 'Orion')
insert into space_ship_info(space_ship_id, space_ship_name)
values (2, 'SpaceX Dragon')
insert into space_ship_info(space_ship_id, space_ship_name)
values (3, 'Falcon Heavy')
insert into space_ship_info(space_ship_id, space_ship_name)
values (4, 'Endeavour')
insert into space_ship_info(space_ship_id, space_ship_name)
values (5, 'Ranger - 1')
```

MISSION INFO

```
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (1, 'STS-41', 'PLATO', 2, 32423.98, 3);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (2, 'STS-7', 'MOON', 3, 238900.324, 3);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (5, 'STS-107', 'MOON', 3, 238900.324, 5);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (4, 'STS-132', 'MOON', 3, 238900.324, 4);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (6, 'STS-133', 'MOON', 3, 238900.324, 1);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (7, 'STS-13', 'MOON', 3, 238900.324, 3);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (3, 'STS-23', 'MARS', 1, 2382900.324, 3);
insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION,
MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
values (8, 'MEGATRON', 'CYBERTRON', 4, 3382900.324, 3);
```

MISSION SITE INFO

```
insert into mission_site_info(mission_site_id, mission_site_name, mission_site_city,
mission_site_state, mission_site_country)
values (1,'Cape Canaveral Air Force Station', 'Vrevar County', 'Florida', 'USA')
insert into mission_site_info(mission_site_id, mission_site_name, mission_site_city,
mission_site_state, mission_site_country)
values (2,'Vandenberg Air Force Base', 'Vanderberg', 'California', 'USA')
insert into mission_site_info(mission_site_id, mission_site_name, mission_site_city,
mission_site_state, mission_site_country)
values (3,'Wallops Island Flight Facility', 'Wallops', 'Virginia', 'USA')
insert into mission_site_info(mission_site_id, mission_site_name, mission_site_city,
mission_site_state, mission_site_country)
values (4,'OTRAG Lauch Center', 'Zaire', 'Zaire', 'Congo')
insert into mission_site_info(mission_site_id, mission_site_name, mission_site_city,
mission_site_state, mission_site_country)
values (5,'Centre Intermees', 'Hammaguir', 'Hammaguir', 'Algeria')
```

MISSION LAND INFO

```
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (1,3,'12/3/2010', 1)
```

```
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (2,2,'2/3/2009', 2)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (3,1,'2/3/2003', 1)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (4,4,'2/3/2006', 2)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (5,6,'2/3/2005', 4)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (6,7,'2/3/2014', 5)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (7,8,'2/3/2005', 2)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (8,5,'2/3/2006', 3)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (9,10,'2/3/2018', 4)
insert into mission_land_info(mission_land_id, mission_id, mission_land_date,
mission_landing_site_id)
values (10,9,'2/3/2017', 2)
```

MISSION LAUNCH INFO

```
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(1,3,'2-JAN-2009',2);
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(2,2,'2-JAN-2007',1);
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(3,1,'2-JAN-2000',3);
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(4,4,'2-JAN-2003',3);
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(5,6,'2-JAN-2004',5);
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,
MISSION_LAUNCH_DATE, MISSION_SITE_ID)
values(6,7,'2-JAN-2013',1);
```



```
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,  
MISSION_LAUNCH_DATE, MISSION_SITE_ID)  
values(7,8,'2-JAN-2004',3);  
insert into MISSION_LAUNCH_INFO(MISSION_LAUNCH_ID, MISSION_ID,  
MISSION_LAUNCH_DATE, MISSION_SITE_ID)  
values(8,5,'2-JAN-2005',2);
```

ASTRONAUT EDUCATION INFO

```
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(1, 1, 1, 2);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(2, 2, 2, 1);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(3, 3, 1, 6);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(4, 4, 1, 5);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(5, 5, 3, 4);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(6, 6, 4, 3);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(7, 7, 2, 10);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(8, 8, 2, 9);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(9, 8, 2, 7);  
insert into astronaut_education_info(astronaut_education_id, university_id, degree_id, astronaut_id)  
values(10, 9, 2, 8);
```

MISSION DETAILS

```
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(1,3,4)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(2,3,6)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(3,4,1)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(4,5,3)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(5,2,5)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(6,5,2)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(7,1,4)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)  
values(8,2,7)  
insert into mission_details(mission_details_id, mission_id, astronaut_id)
```

```
values(9,1,4)
insert into mission_details(mission_details_id, mission_id, astronaut_id)
values(10,3,7)
```

MISSION_LANDING_SITE

```
insert into mission_landing_site(mission_landing_site_id, mission_landing_site_name,
MISSION_LANDING_SITE_CITY,MISSION_LANDING_SITE_STATE,MISSION_LANDING_
SITE_COUNTRY)
values (1,'Cape Canaveral Air Force Station', 'Vrevar County', 'Florida', 'USA')
insert into mission_landing_site(mission_landing_site_id, mission_landing_site_name,
MISSION_LANDING_SITE_CITY,MISSION_LANDING_SITE_STATE,MISSION_LANDING_
SITE_COUNTRY)
values (2,'Vandenberg Air Force Base', 'Vanderberg', 'California', 'USA')
insert into mission_landing_site(mission_landing_site_id, mission_landing_site_name,
MISSION_LANDING_SITE_CITY,MISSION_LANDING_SITE_STATE,MISSION_LANDING_
SITE_COUNTRY)
values (3,'Wallops Island Flight Facility', 'Wallops', 'Virginia', 'USA')
insert into mission_landing_site(mission_landing_site_id, mission_landing_site_name,
MISSION_LANDING_SITE_CITY,MISSION_LANDING_SITE_STATE,MISSION_LANDING_
SITE_COUNTRY)
values (4,'OTRAG Lauch Center', 'Zaire', 'Zaire', 'Congo')
insert into mission_landing_site(mission_landing_site_id, mission_landing_site_name,
MISSION_LANDING_SITE_CITY,MISSION_LANDING_SITE_STATE,MISSION_LANDING_
SITE_COUNTRY)
values (5,'Centre Intermees', 'Hammaguir', 'Hammaguir', 'Algeria')
```

DEGREE_INFO

```
INSERT INTO degree_info(degree_id, degree_name)
VALUES (1, 'Computer Science');
INSERT INTO degree_info(degree_id, degree_name)
VALUES (2, 'Physics');
INSERT INTO degree_info(degree_id, degree_name)
VALUES (3, 'Mathematics');
INSERT INTO degree_info(degree_id, degree_name)
VALUES (4, 'Chemical Engineering');
```

UNIVERSITY_INFO

```
INSERT INTO university_info(university_id, university_name)
VALUES (1, 'University of Arizona');
INSERT INTO university_info(university_id, university_name)
VALUES (2, 'Binghamton University');
INSERT INTO university_info(university_id, university_name)
VALUES (3, 'Harvard University');
INSERT INTO university_info(university_id, university_name)
VALUES (4, 'Princeton University');
INSERT INTO university_info(university_id, university_name)
VALUES (5, 'Rutgers University');
```

```

INSERT INTO university_info(university_id, university_name)
VALUES (6, 'Stony Brook University');
INSERT INTO university_info(university_id, university_name)
VALUES (7, 'Fordam University');
INSERT INTO university_info(university_id, university_name)
VALUES (8, 'Wyoming University');
INSERT INTO university_info(university_id, university_name)
VALUES (9, 'Stanford University');

```

1. Identify all Space Shuttle missions by the Falcon Heavy. Display the mission start date, end date, launch site, landing site and mission objectives.

```

ANS: SELECT mission_launch_date as START_DATE, mission_land_date as END_DATE,
mission_site_name as LAUNCH_SITE, mission_landing_site_name as
LANDING_SITE, mission_objective_name as OBJECTIVES
FROM mission_launch_info, mission_land_info, mission_site_info, mission_landing_site,
mission_info, space_ship_info, mission_objective_info
WHERE space_ship_info.space_ship_name = 'Falcon Heavy' and mission_info.space_ship_id =
space_ship_info.space_ship_id
AND mission_info.mission_objective_id = mission_objective_info.mission_objective_id
AND mission_info.mission_id = mission_launch_info.mission_id
AND mission_info.mission_id = mission_land_info.mission_id
AND mission_launch_info.mission_site_id = mission_site_info.mission_site_id
AND mission_land_info.mission_landing_site_id =
mission_landing_site.mission_landing_site_id

```

START_DATE	END_DATE	LAUNCH_SITE	LANDING_SITE	OBJECTIVES
01/02/2009	12/03/2010	OTRAG Lauch Center	Cape Canaveral Air Force Station	DISCOVERY
01/02/2007	02/03/2009	Centre Intermees	Vandenberg Air Force Base	SATELLITE INSTALLATION
01/02/2000	02/03/2003	Wallops Island Flight Facility	Cape Canaveral Air Force Station	RESEARCH
01/02/2013	02/03/2014	Centre Intermees	Centre Intermees	SATELLITE INSTALLATION

2. Identify missions by astronaut. Display three columns: Astronaut name, number of missions and total mileage. Display one row for each astronaut. Display names in alphabetical order.

```

ANS: SELECT astronaut_fname as first_name, astronaut_lname as last_name,
COUNT(astronaut_fname) as number_of_mission, SUM(mission_distance) as total_mileage
FROM astronaut_info, mission_info, mission_details
WHERE astronaut_info.astronaut_id = mission_details.astronaut_id
AND mission_info.mission_id = mission_details.mission_id
GROUP BY(astronaut_fname, astronaut_lname)
ORDER BY astronaut_fname ASC

```

FIRST_NAME	LAST_NAME	NUMBER_OF_MISSION	TOTAL_MILEAGE
Aleksandr	Aleksandrov	1	238900.324
Joseph	Acaba	1	238900.324
Loren	Acton	1	238900.324
Mike	Adams	1	238900.324
Sally	Ride	1	2382900.324
Valentina	Tereshkova	2	2621800.648
Viktor	Adanasyev	3	303748.284

3. Identify all missions to MOON launched from Centre Intermees in the last 18 years Display the spaceship name, start and end date of mission and objectives. Order the output by date.

ANS: SELECT space_ship_name, mission_launch_date as start_date, mission_land_date as end_date, mission_objective_name as mission_objectives

FROM mission_launch_info, mission_land_info, mission_site_info, mission_landing_site, mission_info, space_ship_info, mission_objective_info

WHERE mission_destination = 'MOON' AND mission_site_name = 'Centre Intermees'

AND mission_info.mission_objective_id = mission_objective_info.mission_objective_id

AND mission_info.mission_id = mission_launch_info.mission_id

AND mission_info.mission_id = mission_land_info.mission_id

AND mission_launch_info.mission_site_id = mission_site_info.mission_site_id

AND mission_land_info.mission_landing_site_id = mission_landing_site.mission_landing_site_id

AND mission_launch_date > '02-02-2000'

AND mission_info.space_ship_id = space_ship_info.space_ship_id

ORDER BY mission_launch_date;

SPACE_SHIP_NAME	START_DATE	END_DATE	MISSION_OBJECTIVES
Falcon Heavy	01/02/2007	02/03/2009	SATELLITE INSTALLATION
Falcon Heavy	01/02/2013	02/03/2014	SATELLITE INSTALLATION

4. Identify the missions by launch site since 2003. Display four columns: Launch site name, site country, site state and number of missions. Display one row for each launch site.

ANS: SELECT mission_site_name as LAUNCH_SITE_NAME, mission_site_state as LAUNCH_SITE_STATE, mission_site_country as LAUNCH_SITE_COUNTRY, count(mission_site_name) as NUMBER_OF_MISSION

FROM mission_site_info, mission_launch_info, mission_info

WHERE mission_launch_info.mission_site_id = mission_site_info.mission_site_id

AND mission_launch_info.mission_id = mission_info.mission_id

AND mission_launch_date > '01-02-2003'

GROUP BY (mission_site_name, mission_site_state, mission_site_country)

LAUNCH_SITE_NAME	LAUNCH_SITE_STATE	LAUNCH_SITE_COUNTRY	NUMBER_OF_MISSION
Cape Canaveral Air Force Station	Florida	USA	1
Centre Intermees	Hammaguir	Algeria	2
OTRAG Launch Center	Zaire	Congo	2

5. Reassign astronaut Viktor Adanasyev from Space Shuttle mission STS-41 to STS-23.
Identify the SQL required to implement.

ANS: BEFORE UPDATE

MISSION_NAME	ASTRONAUT_FNAME	ASTRONAUT_LNAME
STS-132	Joseph	Acaba
STS-107	Loren	Acton
STS-107	Mike	Adams
STS-41	Viktor	Adanasyev
STS-7	Viktor	Adanasyev
STS-107	Viktor	Adanasyev
STS-7	Aleksandr	Aleksandrov
STS-23	Sally	Ride
STS-23	Valentina	Tereshkova
STS-7	Valentina	Tereshkova

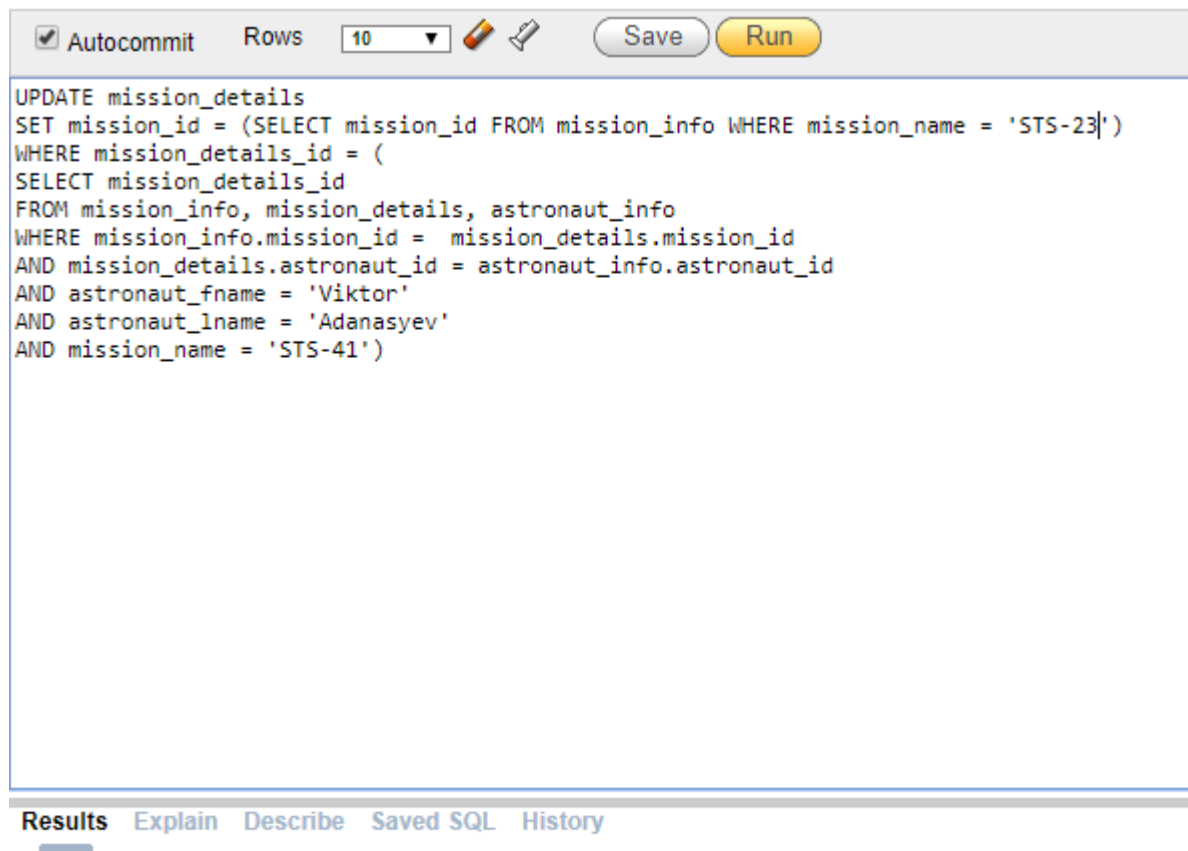
UPDATE mission_details

SET mission_id = (SELECT mission_id FROM mission_info WHERE mission_name = 'STS-107')

WHERE mission_details_id = (

SELECT mission_details_id

```
FROM mission_info, mission_details, astronaut_info  
WHERE mission_info.mission_id = mission_details.mission_id  
AND mission_details.astronaut_id = astronaut_info.astronaut_id  
AND astronaut_fname = 'Viktor'  
AND astronaut_lname = 'Adanasyev'  
AND mission_name = 'STS-13')  
AFTER UPDATE:
```



The screenshot shows a SQL IDE window with a toolbar at the top containing 'Autocommit' (checked), 'Rows' (set to 10), and 'Save' and 'Run' buttons. The main text area contains the following SQL statement:

```
UPDATE mission_details  
SET mission_id = (SELECT mission_id FROM mission_info WHERE mission_name = 'STS-23')  
WHERE mission_details_id = (  
SELECT mission_details_id  
FROM mission_info, mission_details, astronaut_info  
WHERE mission_info.mission_id = mission_details.mission_id  
AND mission_details.astronaut_id = astronaut_info.astronaut_id  
AND astronaut_fname = 'Viktor'  
AND astronaut_lname = 'Adanasyev'  
AND mission_name = 'STS-41')
```

Below the text area is a tabbed interface with 'Results' selected, showing the execution output.

1 row(s) updated.

0.01 seconds

MISSION_NAME	ASTRONAUT_FNAME	ASTRONAUT_LNAME
STS-132	Joseph	Acaba
STS-107	Loren	Acton
STS-107	Mike	Adams
STS-23	Viktor	Adanasyev
STS-7	Viktor	Adanasyev
STS-107	Viktor	Adanasyev
STS-7	Aleksandr	Aleksandrov
STS-23	Sally	Ride
STS-23	Valentina	Tereshkova
STS-7	Valentina	Tereshkova

6. Identify astronauts who have a physics degree. Use a nested select to answer this question.

ANS: SELECT astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender

FROM astronaut_info

WHERE astronaut_id IN

(SELECT astronaut_id

FROM astronaut_education_info, degree_info

WHERE degree_name = 'Physics'

AND degree_info.degree_id = astronaut_education_info.degree_id)

ASTRONAUT_FNAME	ASTRONAUT_LNAME	ASTRONAUT_DOB	ASTRONAUT_COUNTRY	ASTRONAUT_GENDER
Joseph	Acaba	12/12/1967	USA	M
Valentina	Tereshkova	12/12/1951	Russia	F
Eileen	Collins	12/12/1956	USA	F
Judith	Resnik	12/12/1949	USA	F
Shannon	Lucid	12/02/1943	USA	F

7. Cancel Space Shuttle mission MEGATRON. Identify the SQL to implement.



ANS: I use **ON DELETE CASCADE** rather than Deleting parent table record and then the corresponding records in the child table one by one.

BEFORE DELETE:

MISSION_NAME	ASTRONAUT_FNAME	ASTRONAUT_LNAME	LAUNCH_SITE_NAME	LANDING_SITE_NAME
STS-132	Joseph	Acaba	Wallops Island Flight Facility	Vandenberg Air Force Base
STS-107	Loren	Acton	OTRAG Lauch Center	Wallops Island Flight Facility
MEGATRON	Mike	Adams	OTRAG Lauch Center	Wallops Island Flight Facility
STS-107	Mike	Adams	OTRAG Lauch Center	Wallops Island Flight Facility
STS-23	Viktor	Adanasyev	OTRAG Lauch Center	Cape Canaveral Air Force Station
STS-7	Viktor	Adanasyev	Centre Intermees	Vandenberg Air Force Base
STS-107	Viktor	Adanasyev	OTRAG Lauch Center	Wallops Island Flight Facility
STS-7	Aleksandr	Aleksandrov	Centre Intermees	Vandenberg Air Force Base
STS-23	Sally	Ride	OTRAG Lauch Center	Cape Canaveral Air Force Station
STS-23	Valentina	Tereshkova	OTRAG Lauch Center	Cape Canaveral Air Force Station
STS-7	Valentina	Tereshkova	Centre Intermees	Vandenberg Air Force Base

AFTER DELETE:

DELETE FROM mission_info WHERE mission_name = 'MEGATRON';

☒ Autocommit Rows   Save Run

DELETE FROM mission_info WHERE mission_name = 'MEGATRON|';

Results [Explain](#) [Describe](#) [Saved SQL](#) [History](#)

1 row(s) deleted.

MISSION_NAME	ASTRONAUT_FNAME	ASTRONAUT_LNAME	LAUNCH_SITE_NAME	LANDING_SITE_NAME
STS-132	Joseph	Acaba	Wallops Island Flight Facility	Vandenberg Air Force Base
STS-107	Loren	Acton	OTRAG Launch Center	Wallops Island Flight Facility
STS-107	Mike	Adams	OTRAG Launch Center	Wallops Island Flight Facility
STS-23	Viktor	Adanasyev	OTRAG Launch Center	Cape Canaveral Air Force Station
STS-7	Viktor	Adanasyev	Centre Intermees	Vandenberg Air Force Base
STS-107	Viktor	Adanasyev	OTRAG Launch Center	Wallops Island Flight Facility
STS-7	Aleksandr	Aleksandrov	Centre Intermees	Vandenberg Air Force Base
STS-23	Sally	Ride	OTRAG Launch Center	Cape Canaveral Air Force Station
STS-23	Valentina	Tereshkova	OTRAG Launch Center	Cape Canaveral Air Force Station
STS-7	Valentina	Tereshkova	Centre Intermees	Vandenberg Air Force Base

8. Identify astronauts without missions in the last 14 years. Display the astronaut name and country. Use a nested select to answer this question.

ANS: SELECT astronaut_fname as FIRST_NAME, astronaut_lname as LAST_NAME,
astronaut_country as COUNTRY

FROM mission_info, astronaut_info, mission_details

WHERE mission_info.mission_id NOT IN

(SELECT mission_info.mission_id

FROM mission_info, mission_launch_info

WHERE mission_info.mission_id = mission_launch_info.mission_id

AND mission_launch_date > '02-02-2003'

)

AND mission_info.mission_id = mission_details.mission_id

AND astronaut_info.astronaut_id = mission_details.astronaut_id

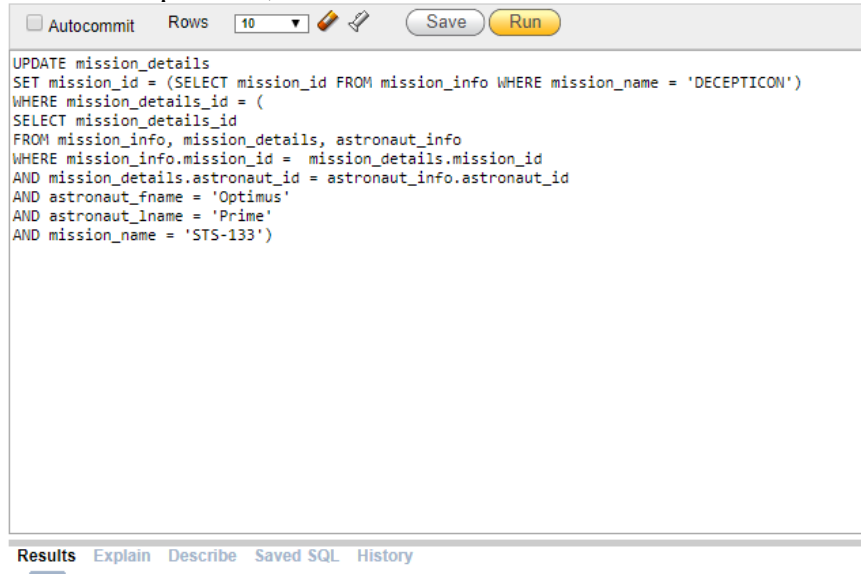
GROUP BY(astronaut_fname, astronaut_lname, astronaut_country)

FIRST_NAME	LAST_NAME	COUNTRY
Viktor	Adanasyev	RUSSIA
Joseph	Acaba	USA

9. In one SQL window, reassign Astronaut A to mission 1. Don't commit. In another SQL window, delete mission 1. Don't commit. Explain your results. Resolve the problem. Disable the auto commit flag at the top of the window before performing this operation.

ANS: I cannot delete the mission from the mission_info unless I made the commit. When I am deleting mission from the mission_info table, this row is locked by another transaction. I

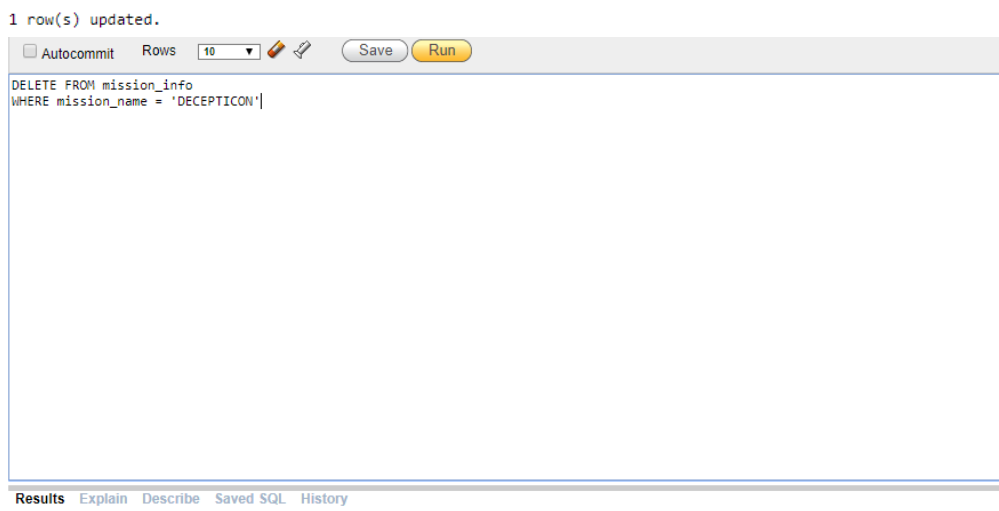
am not able to perform any DML until I made commit after perform, the first transaction. To resolve this problem, I must have to made commit.



The screenshot shows a SQL window with a toolbar at the top containing an 'Autocommit' checkbox, a 'Rows' dropdown set to 10, and 'Save' and 'Run' buttons. The SQL statement is:

```
UPDATE mission_details
SET mission_id = (SELECT mission_id FROM mission_info WHERE mission_name = 'DECEPTICON')
WHERE mission_details_id = (
SELECT mission_details_id
FROM mission_info, mission_details, astronaut_info
WHERE mission_info.mission_id = mission_details.mission_id
AND mission_details.astronaut_id = astronaut_info.astronaut_id
AND astronaut_fname = 'Optimus'
AND astronaut_lname = 'Prime'
AND mission_name = 'STS-133')
```

Below the SQL statement, the 'Results' tab is selected, showing '1 row(s) updated.' The bottom of the window has tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'.



The screenshot shows a SQL window with a toolbar at the top containing an 'Autocommit' checkbox, a 'Rows' dropdown set to 10, and 'Save' and 'Run' buttons. The SQL statement is:

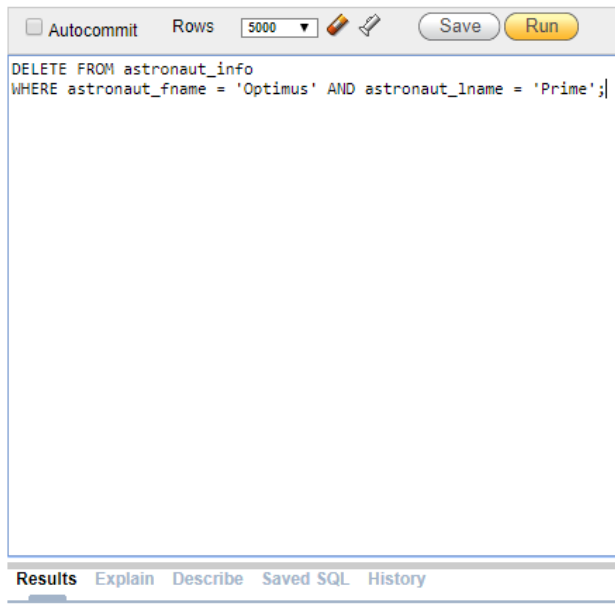
```
DELETE FROM mission_info
WHERE mission_name = 'DECEPTICON'
```

Below the SQL statement, the 'Results' tab is selected, showing '1 row(s) updated.' The bottom of the window has tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'.

ORA-00060: deadlock detected while waiting for resource

10. In one SQL window, delete the astronaut Sally Ride. Don't commit. In another SQL window, assign astronaut Sally Ride to a new mission. Don't commit. Explain your results. Resolve the problem. Create a backup table before implementing. To create a backup table, enter `CREATE TABLE <NEWTABLE> AS SELECT * FROM <ORIGINALTABLE>; COMMIT`; Then you can rename a Table using the `RENAME TABLE` commit. Disable the auto commit flag at the Top of the window before performing this operation.

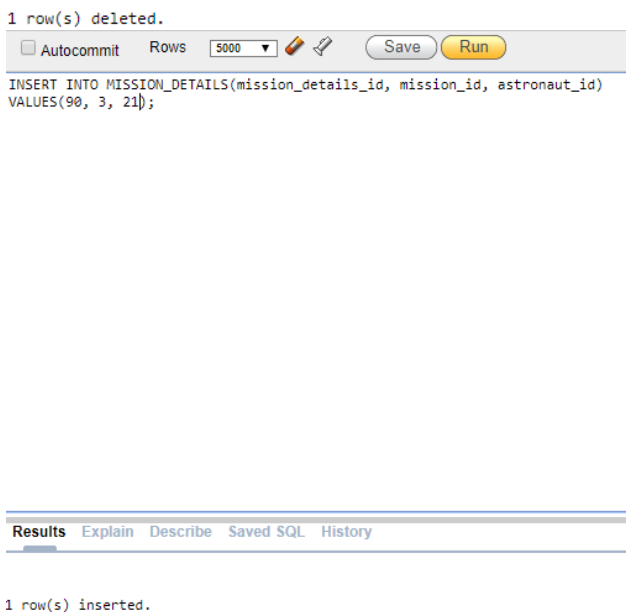
ANS:



The screenshot shows an SQL IDE window with a toolbar at the top containing 'Autocommit' (unchecked), 'Rows' (5000), and 'Save' and 'Run' buttons. The SQL editor contains the following statement:

```
DELETE FROM astronaut_info  
WHERE astronaut_fname = 'Optimus' AND astronaut_lname = 'Prime';
```

Below the editor, a tabbed interface shows 'Results' selected, displaying the message: '1 row(s) deleted.'



The screenshot shows an SQL IDE window with a toolbar at the top containing 'Autocommit' (unchecked), 'Rows' (5000), and 'Save' and 'Run' buttons. The SQL editor contains the following statement:

```
INSERT INTO MISSION_DETAILS(mission_details_id, mission_id, astronaut_id)  
VALUES(90, 3, 21);
```

Below the editor, a tabbed interface shows 'Results' selected, displaying the message: '1 row(s) inserted.'

To resolve the problem, I must need to do commit the transaction.

11. In one SQL window, rename the Space Shuttle **ORION** to **IRONIDE**. Don't commit. In another SQL window, change the Space Shuttle **ORION** to **LEXINGTON**. Don't commit. Quit both Oracle sessions. Login to Oracle and display all information for the Space Shuttle Enterprise. Explain your results. Disable the auto commit flag at the top of the windows before performing this operation.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
SPACE_SHIP_INFO	SPACE_SHIP_ID	NUMBER	22	-	-	1	-	-	-
	SPACE_SHIP_NAME	VARCHAR2	30	-	-	-	✓	-	-
1 - 2									

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<u>ASTRONAUT EDUCATION INFO</u>	<u>ASTRONAUT EDUCATION ID</u>	NUMBER	22	-	-	1	-	-	-
	<u>UNIVERSITY ID</u>	NUMBER	22	-	-	-	✓	-	-
	<u>DEGREE ID</u>	NUMBER	22	-	-	-	✓	-	-
	<u>ASTRONAUT ID</u>	NUMBER	22	-	-	-	✓	-	-
1 - 4									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<u>MISSION OBJECTIVE INFO</u>	<u>MISSION OBJECTIVE ID</u>	NUMBER	22	-	-	1	-	-	-
	<u>MISSION OBJECTIVE NAME</u>	VARCHAR2	30	-	-	-	-	-	-
1 - 2									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<u>UNIVERSITY INFO</u>	<u>UNIVERSITY ID</u>	NUMBER	22	-	-	1	-	-	-
	<u>UNIVERSITY NAME</u>	VARCHAR2	30	-	-	-	-	-	-
1 - 2									

13. Display the Oracle version by entering

ANS:

PRODUCT	VERSION	STATUS
NLSRTL	11.2.0.2.0	Production
Oracle Database 11g Express Edition	11.2.0.2.0	64bit Production
PL/SQL	11.2.0.2.0	Production
TNS for 64-bit Windows:	11.2.0.2.0	Production

14. Utilize Oracle SQL security roles to limit access to only display astronaut data. This security role will be able to only display data and not add, delete or change astronaut data. Identify the SQL operations to implement and demonstrate the functionality of the security roles.

ANS: We can create a user and grant permissions in oracle using queries below:

Creating User:

```
CREATE USER USER IDENTIFIED BY PASSWORD;
GRANT CONNECT TO USER;
GRANT CREATE SESSION, GRANT ANY PRIVILEGE TO USER;
GRANT CREATE TABLE TO USER;
GRANT UNLIMITED TABLESPACE TO USER;
```

Giving user to perform all the operation:

```
GRANT SELECT ON nasa_space_exploration.astronaut_info TO USER;
```

```
GRANT DELETE ON nasa_space_exploration.astronaut_info TO USER;
GRANT UPDATE ON nasa_space_exploration.astronaut_info TO USER;
GRANT INSERT ON nasa_space_exploration.astronaut_info TO USER
```

To revoke THE DELETE, UPDATE and INSERT:

```
REVOKE delete ON nasa_space_exploration.astronaut_info FROM USER;
REVOKE update ON nasa_space_exploration.astronaut_info FROM USER;
REVOKE insert ON nasa_space_exploration.astronaut_info FROM USER;
```

```
SQL> delete from nasa_space_exploration.astronaut_info where astronaut_id = 16;
delete from nasa_space_exploration.astronaut_info where astronaut_id = 16
*
ERROR at line 1:
ORA-01031: insufficient privileges

SQL> update nasa_space_exploration.astronaut_info
  2 SET astronaut_fname = 'Alfred'
  3 WHERE astronautu_id = 1;
WHERE astronautu_id = 1
*
ERROR at line 3:
ORA-00904: "ASTRONATU_ID": invalid identifier

SQL> update nasa_space_exploration.astronaut_info
  2 SET astronaut_fname = 'Alfred'
  3 WHERE astronaut_id = 1;
update nasa_space_exploration.astronaut_info
*
ERROR at line 1:
ORA-01031: insufficient privileges

SQL> insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
  2 values (31, 'Shannon', 'Lucid', '12/2/1943', 'USA', 'F');
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
*
ERROR at line 1:
ORA-00942: table or view does not exist

SQL> insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
  2 values (31, 'Shannon', 'Lucid', '12/2/1943', 'USA', 'F');
insert into astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
*
ERROR at line 1:
ORA-00942: table or view does not exist

SQL> insert into nasa_space_exploration.astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
  2 values (31, 'Shannon', 'Lucid', '12/2/1943', 'USA', 'F');
insert into nasa_space_exploration.astronaut_info(astronaut_id, astronaut_fname, astronaut_lname, astronaut_dob, astronaut_country, astronaut_gender)
*
ERROR at line 1:
ORA-01031: insufficient privileges

SQL>
```

15. Utilize Oracle SQL security roles to allow the adding of new missions, but prevent the deletion or changes to missions. Identify the SQL operations to implement and demonstrate the functionality of the security roles.

ANS:

Giving user to perform all the operation:

```
GRANT INSERT ON nasa_space_exploration.mission_info TO USER;
GRANT DELETE ON nasa_space_exploration.mission_info TO USER;
GRANT SELECT ON nasa_space_exploration.mission_info TO USER;
GRANT UPDATE ON nasa_space_exploration.mission_info TO USER;
```

To revoke THE DELETE and UPDATE:

```
REVOKE DELETE ON nasa_space_exploration.mission_info FROM USER;
```

REVOKE UPDATE ON nasa_space_exploration.mission_info FROM USER;

```
SQL> UPDATE nasa_space_exploration.mission_info
  2 SET mission_name = 'CRYPTON'
  3 WHERE mission_id = 2;
UPDATE nasa_space_exploration.mission_info
      *
ERROR at line 1:
ORA-01031: insufficient privileges

SQL> insert into MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION, MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
  2 insert into NASA_SPACE_EXPLORATION.MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION, MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
  3 (10, 'MEGATRON', 'CYBERTRON', 4, 3382900.324, 3);
insert into NASA_SPACE_EXPLORATION.MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION, MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
      *
ERROR at line 2:
ORA-00926: missing VALUES keyword

SQL> insert into NASA_SPACE_EXPLORATION.MISSION_INFO(MISSION_ID, MISSION_NAME, MISSION_DESTINATION, MISSION_OBJECTIVE_ID, MISSION_DISTANCE, SPACE_SHIP_ID)
  2 VALUES (10, 'MEGATRON', 'CYBERTRON', 4, 3382900.324, 3);

1 row created.
```