```sql
-- James Gray, CIS 417 Assignment #8
-- DDL statements to create and populate tables
-- SQL Server 2012

CREATE TABLE Starship
        -- Starship contains starship details
        (starshipID SMALLINT NOT NULL,
         starshipName VARCHAR (20) NOT NULL,
         crewSize SMALLINT NOT NULL,
         shipClass VARCHAR (20) NOT NULL,
         launchStarDate SMALLINT NOT NULL,
         CONSTRAINT pk_starshipID PRIMARY KEY (starshipID)
         );

CREATE TABLE Planet
        -- Planet contains planet details
        (planetID SMALLINT NOT NULL,
         planetName VARCHAR (20) NOT NULL,
         radius SMALLINT NOT NULL,
         atmosphere VARCHAR (20) NOT NULL,
         CONSTRAINT pk_planetID PRIMARY KEY (planetID)
         );

CREATE TABLE PlanetVisit
        -- PlanetVisit contains the details of starships that visit planets
        (planetID SMALLINT NOT NULL,
         starshipID SMALLINT NOT NULL,
         arrivalStarDate SMALLINT NOT NULL,
         departureStarDate SMALLINT NOT NULL,
         CONSTRAINT pk_planetVisit PRIMARY KEY (planetID, starshipID, arrivalStarDate),
         CONSTRAINT fk_planetVisit_planetID FOREIGN KEY (planetID) REFERENCES Planet
(planetID),
         CONSTRAINT fk_planetVisit_starshipID FOREIGN KEY (starshipID) REFERENCES Starship
(starshipID)
         );


-- populate starship table

INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('351','Stingray','200','StellarIV', '21450');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('352','Excelsior','200','StellarIV', '21470');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('400','Odyssey','130', 'LightCruiser','21700');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('402','Daredevil','128', 'LightCruiser','21550');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('500','Adventure','85', 'Argon','21523');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('501','Challenger','80', 'Argon','21553');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('503','Invincible','75', 'Argon','21537');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('601','Navigator','1850', 'Explorer','21855');
```

```sql
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('602','Far Journey','1900', 'Explorer','21890');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('700','Davidson','500', 'Admiral','21600');
INSERT INTO Starship (starshipID, starshipName, crewSize, shipClass, launchStarDate)
VALUES ('701','Cochran','500', 'Admiral','21650');

-- populate planet table

INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES ('1','Vulcan','3500',
'Nitrogen/Oxygen');
INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES ('2','Earth','4000',
'Nitrogen/Oxygen');
INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES ('3','Galactus Prime
IV','400', 'None');
INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES ('4','Sigma Alpha
Gamma','2500', 'Methane');
INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES
('5','Romulus','4400', 'Nitrogen');
INSERT INTO Planet (planetID, planetName,radius, atmosphere) VALUES ('6','Borg','10000',
'Unknown');

-- populate planetvisit Table

INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('1','351','22000','22008');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('1','351','22022','22029');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('1','701','22033','22044');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('2','352','22040','22044');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('2','402','22045','22047');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('3','352','22016','22017');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('3','701','22059','22063');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('4','352','22050','22052');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('4','402','22043','22044');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('5','402','22049','22053');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('5','701','22049','22052');
INSERT INTO PlanetVisit (planetID, starshipID, arrivalStarDate, departureStarDate) VALUES
('6','352','22055','22059');


--      1. List all details of the known planets.

SELECT * FROM Planet;
```

planetID	planetName	radius	atmosphere
1	Vulcan	3500	Nitrogen/Oxygen
2	Earth	4000	Nitrogen/Oxygen
3	Galactus Prime IV	400	None
4	Sigma Alpha Gamma	2500	Methane
5	Romulus	4400	Nitrogen
6	Borg	10000	Unknown

```
--      2. List the name, crew size, and ship class for every starship.

SELECT starshipName, crewSize, shipClass FROM Starship;
```

	starshipName	crewSize	shipClass
1	Stingray	200	StellarIV
2	Excelsior	200	StellarIV
3	Odyssey	130	LightCruiser
4	Daredevil	128	LightCruiser
5	Adventure	85	Argon
6	Challenger	80	Argon
7	Invincible	75	Argon
8	Navigator	1850	Explorer
9	Far Journey	1900	Explorer
10	Davidson	500	Admiral
11	Cochran	500	Admiral

```
--      3. What is the name of starship number 501?

SELECT starshipName FROM starship
      WHERE starshipID = 501;
```

	starshipName
1	Challenger

```
--      4. Show all Starships launched after stardate 21500, sorted by shipClass and name.

SELECT starshipName, crewSize, shipClass, launchStarDate FROM Starship
      WHERE launchStarDate > 21500
      ORDER BY shipClass, starshipName;
```

	starshipName	crewSize	shipClass	launchStarDate
1	Cochran	500	Admiral	21650
2	Davidson	500	Admiral	21600
3	Adventure	85	Argon	21523
4	Challenger	80	Argon	21553
5	Invincible	75	Argon	21537
6	Far Journey	1900	Explorer	21890
7	Navigator	1850	Explorer	21855
8	Daredevil	128	LightCruiser	21550
9	Odyssey	130	LightCruiser	21700

```
--      5. Show all Starships except those in the 'Argon' class, sorted by launchStardate.

SELECT * FROM Starship
        WHERE NOT (shipClass = 'Argon')
        ORDER BY launchStardate;
```

	starshipID	starshipName	crewSize	shipClass	launchStarDate
1	351	Stingray	200	StellarIV	21450
2	352	Excelsior	200	StellarIV	21470
3	402	Daredevil	128	LightCruiser	21550
4	700	Davidson	500	Admiral	21600
5	701	Cochran	500	Admiral	21650
6	400	Odyssey	130	LightCruiser	21700
7	601	Navigator	1850	Explorer	21855
8	602	Far Journey	1900	Explorer	21890

```
--      6. Show all planets with a radius ranging from 2000 to 4000 kilometers, sorted
from largest to smallest.

SELECT * from Planet
        WHERE radius >= 2000 AND radius <= 4000
        ORDER BY radius DESC;
```

planetID	planetName	radius	atmosphere
2	Earth	4000	Nitrogen/Oxygen
1	Vulcan	3500	Nitrogen/Oxygen
4	Sigma Alpha Gamma	2500	Methane

```
-- 7. Show all PlanetVisits where the length of the visit >= 4 stardates.

SELECT planetID, starshipID, departureStarDate - arrivalStarDate AS visitLength FROM
PlanetVisit
       WHERE (departureStarDate - arrivalStarDate) >= 4;
```

planetID	starshipID	visitLength
1	351	8
1	351	7
1	701	11
2	352	4
3	701	4
5	402	4
6	352	4

```
--      8. List the planet, starship, and length of stay for each planet visit.

SELECT planetName, starshipName, departureStarDate - arrivalStarDate AS lengthOfStay
       FROM PlanetVisit v INNER JOIN Planet p
       ON v.planetID = p.planetID
       INNER JOIN Starship s
       ON s.starshipID = v.starshipID;
```

planetName	starshipName	lengthOfStay
Vulcan	Stingray	8
Vulcan	Stingray	7
Vulcan	Cochran	11
Earth	Excelsior	4
Earth	Daredevil	2
Galactus Prime IV	Excelsior	1
Galactus Prime IV	Cochran	4
Sigma Alpha Gamma	Excelsior	2
Sigma Alpha Gamma	Daredevil	1
Romulus	Daredevil	4
Romulus	Cochran	3
Borg	Excelsior	4

```
--      9. Show all PlanetVisits to planets with planetIDs 1, 2, and 5, sorted by planetID
and starshipID.

SELECT * FROM PlanetVisit
       WHERE planetID IN ('1', '2', '5')
       ORDER BY planetID, starshipID;
```

planetID	starshipID	arrivalStarDate	departureStarDate
1	351	22000	22008
1	351	22022	22029
1	701	22033	22044
2	352	22040	22044
2	402	22045	22047
5	402	22049	22053
5	701	22049	22052

```
--     10. Show the average crew size for all starships in each shipClass. The result
table should have two columns: 'shipClass' and 'Average Crew'.

SELECT shipClass, AVG (crewSize) as Average_Crew
     FROM Starship
     GROUP BY shipClass;
```

shipClass	Average_Crew
Admiral	500
Argon	80
Explorer	1875
LightCruiser	129
StellarIV	200

```
-- 11. For each Planet, show the number of visits made by all starships. Your result
table should have two columns: 'planetID' and 'Num Visits'.

SELECT planetID, COUNT (planetID) AS 'Num Visits'
     FROM PlanetVisit
     GROUP BY planetID;
```

planetID	Num Visits
1	3
2	2
3	2
4	2
5	2
6	1

```
--     12. Show all Starships whose name has an 'a' as the 2nd character (For example,
'Navigator').

SELECT starshipName FROM Starship
     WHERE starshipName LIKE '_a%';
```

starshipName
Daredevil
Navigator
Far Journey
Davidson

```
--      13. List the details of each planet visit along with the crewsize of the starship
making the visit.

SELECT p.planetID, p.planetName, s.starshipID, s.starshipName, v.arrivalStarDate,
v.departureStarDate, s.crewSize
        FROM planetVisit v INNER JOIN Starship s
        ON v.starshipID = s.starshipID
        INNER JOIN Planet p
        ON v.planetID = p.planetID;
```

planetID	planetName	starshipID	starshipName	arrivalStarDate	departureStarDate	crewSize
1	Vulcan	351	Stingray	22000	22008	200
1	Vulcan	351	Stingray	22022	22029	200
1	Vulcan	701	Cochran	22033	22044	500
2	Earth	352	Excelsior	22040	22044	200
2	Earth	402	Daredevil	22045	22047	128
3	Galactus Prime IV	352	Excelsior	22016	22017	200
3	Galactus Prime IV	701	Cochran	22059	22063	500
4	Sigma Alpha Gamma	352	Excelsior	22050	22052	200
4	Sigma Alpha Gamma	402	Daredevil	22043	22044	128
5	Romulus	402	Daredevil	22049	22053	128
5	Romulus	701	Cochran	22049	22052	500
6	Borg	352	Excelsior	22055	22059	200

```
--      14. Create a table 'Moon' with the following attributes:  MoonID, name, PlanetID,
radius.

CREATE TABLE Moon
        (MoonID SMALLINT NOT NULL,
         name VARCHAR (30) NOT NULL,
         PlanetID SMALLINT NOT NULL,
         radius SMALLINT NOT NULL
         CONSTRAINT pk_MoonID PRIMARY KEY (MoonID)
         );


--      15. Add a constraint to the 'Moon' table making planetId a foreign key to the
Planet table.

ALTER TABLE Moon
        ADD CONSTRAINT fk_Moon_planetID FOREIGN KEY (planetID) REFERENCES Planet
(planetID);
```

```
--      16. Insert 5 rows of data into the 'Moon' table.

INSERT INTO Moon (MoonID, name, PlanetID, radius) VALUES ('1', 'Venus', '1', '1000');
INSERT INTO Moon (MoonID, name, PlanetID, radius) VALUES ('2', 'Sun', '2', '1500');
INSERT INTO Moon (MoonID, name, PlanetID, radius) VALUES ('3', 'Pluto', '3', '800');
INSERT INTO Moon (MoonID, name, PlanetID, radius) VALUES ('4', 'Zeus', '4', '1000');
INSERT INTO Moon (MoonID, name, PlanetID, radius) VALUES ('5', 'Grayzone', '5', '700');


--      17. Delete the 'Moon' table.

DROP TABLE Moon;
```

Messages
    Command(s) completed successfully.
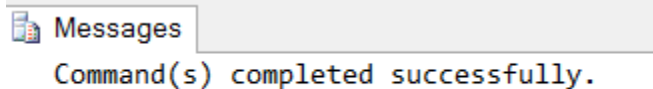
```
--      18. Union the name of every starship in the 'Admiral' class with the name of every
planet with a radius > 3000.

SELECT starshipName AS StarshipPlanetUnion
        FROM Starship s
        WHERE s.shipClass = 'Admiral'
        UNION
        SELECT planetName
        FROM Planet p
        WHERE p.radius > 3000;
```

StarshipPlanetUnion
Borg
Cochran
Davidson
Earth
Romulus
Vulcan

```
--      19. Find the name, crewsize, and shipclass of every starship whose crewsize is
larger then the crewsize of every starship of shipclass 'LightCruiser'.

SELECT starshipName, crewSize, shipClass
        FROM Starship
        WHERE crewSize > (SELECT MAX (crewSize) max_crewSize FROM Starship WHERE shipClass
= 'LightCruiser');
```

starshipName	crewSize	shipClass
Stingray	200	StellarIV
Excelsior	200	StellarIV
Navigator	1850	Explorer
Far Journey	1900	Explorer
Davidson	500	Admiral
Cochran	500	Admiral

```
--      20. Change the name of starship 351 to 'Atlas'.

UPDATE Starship
       SET starshipName = 'Atlas'
       WHERE starshipID = '351';
```

Messages

```
   (1 row(s) affected)
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