


CS 586 Introduction to Databases  
Assignment 2 – Basic SQL Queries  
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Part I

(a) Create a table with columns for Name, Stamina, Capture Rate, Flee Rate and Candy, with Name as the primary key.

```
CREATE TABLE PokemonGoData
(
Name VARCHAR(20) NOT NULL,
Stamina INT,
CaptureRate DECIMAL(6, 3),
FleeRate DECIMAL(6, 3),
Candy INT,
PRIMARY KEY(Name)
);
```

Column	Type	Not Null	Default	Constraints	Actions				Comment
name	character varying(20)	NOT NULL			<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
stamina	integer				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
captureRate	numeric(6,3)				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
fleeRate	numeric(6,3)				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
candy	integer				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	

(b) Insert rows for all characters with stamina less than 120.

```
INSERT INTO PokemonGoData
VALUES ('Bulbasaur', 90, 0.16, 0.1, 25);
INSERT INTO PokemonGoData
VALUES ('Charmander', 78, 0.16, 0.1, 25);
INSERT INTO PokemonGoData
VALUES ('Charmeleon', 116, 0.08, 0.07, 100);
INSERT INTO PokemonGoData
VALUES ('Squirtle', 88, 0.16, 0.1, 25);
INSERT INTO PokemonGoData
VALUES ('Wartortle', 118, 0.08, 0.07, 100);
INSERT INTO PokemonGoData
VALUES ('Caterpie', 90, 0.4, 0.2, 12);
INSERT INTO PokemonGoData
VALUES ('Metapod', 100, 0.2, 0.09, 50);
INSERT INTO PokemonGoData
VALUES ('Weedle', 80, 0.4, 0.2, 12);
INSERT INTO PokemonGoData
VALUES ('Kakuna', 90, 0.2, 0.09, 50);
INSERT INTO PokemonGoData
```

```
VALUES ('Pidgey', 80, 0.4, 0.2, 12);
INSERT INTO PokemonGoData
VALUES ('Rattata', 60, 0.4, 0.2, 25);
INSERT INTO PokemonGoData
VALUES ('Raticate', 110, 0.16, 0.07, NULL);
INSERT INTO PokemonGoData
VALUES ('Spearow', 80, 0.4, 0.15, 50);
INSERT INTO PokemonGoData
VALUES ('Ekans', 70, 0.4, 0.15, 50);
INSERT INTO PokemonGoData
VALUES ('Pikachu', 70, 0.16, 0.1, 50);
```

Actions		name	stamina	capture rate	flee rate	candy
Edit	Delete	Bulbasaur	90	0.160	0.100	25
Edit	Delete	Charmander	78	0.160	0.100	25
Edit	Delete	Charmeleon	116	0.080	0.070	100
Edit	Delete	Squirtle	88	0.160	0.100	25
Edit	Delete	Wartortle	118	0.080	0.070	100
Edit	Delete	Caterpie	90	0.400	0.200	12
Edit	Delete	Metapod	100	0.200	0.090	50
Edit	Delete	Weedle	80	0.400	0.200	12
Edit	Delete	Kakuna	90	0.200	0.090	50
Edit	Delete	Pidgey	80	0.400	0.200	12
Edit	Delete	Rattata	60	0.400	0.200	25
Edit	Delete	Raticate	110	0.160	0.070	NULL
Edit	Delete	Spearow	80	0.400	0.150	50
Edit	Delete	Ekans	70	0.400	0.150	50
Edit	Delete	Pikachu	70	0.160	0.100	50

(c) What happens if you try to insert Squirtle a second time?

```
INSERT INTO PokemonGoData
VALUES ('Squirtle', 88, 0.16, 0.1, 25);
```

**SQL error:**


```
ERROR:  duplicate key value violates unique constraint "pokemongodata_pkey"
DETAIL:  Key (name)=(Squirtle) already exists.
```

**In statement:**

```
INSERT INTO PokemonGoData
VALUES ('Squirtle', 88, 0.16, 0.1, 25);
```

(d) Modify your table to add columns for Attack and Defense.

```
ALTER TABLE PokemonGoData
ADD Attack INT NULL;
ALTER TABLE PokemonGoData
ADD Defense INT NULL;
```

Column	Type	Not Null	Default	Constraints	Actions				Comment
name	character varying(20)	NOT NULL			Browse	Alter	Privileges	Drop	
stamina	integer				Browse	Alter	Privileges	Drop	
capture_rate	numeric(6,3)				Browse	Alter	Privileges	Drop	
flee_rate	numeric(6,3)				Browse	Alter	Privileges	Drop	
candy	integer				Browse	Alter	Privileges	Drop	
attack	integer				Browse	Alter	Privileges	Drop	
defense	integer				Browse	Alter	Privileges	Drop	

Actions		name	stamina	capture_rate	flee_rate	candy	attack	defense
Edit	Delete	Bulbasaur	90	0.160	0.100	25	NULL	NULL
Edit	Delete	Charmander	78	0.160	0.100	25	NULL	NULL
Edit	Delete	Charmeleon	116	0.080	0.070	100	NULL	NULL
Edit	Delete	Squirtle	88	0.160	0.100	25	NULL	NULL
Edit	Delete	Wartortle	118	0.080	0.070	100	NULL	NULL
Edit	Delete	Caterpie	90	0.400	0.200	12	NULL	NULL
Edit	Delete	Metapod	100	0.200	0.090	50	NULL	NULL
Edit	Delete	Weedle	80	0.400	0.200	12	NULL	NULL
Edit	Delete	Kakuna	90	0.200	0.090	50	NULL	NULL
Edit	Delete	Pidgey	80	0.400	0.200	12	NULL	NULL
Edit	Delete	Rattata	60	0.400	0.200	25	NULL	NULL
Edit	Delete	Raticate	110	0.160	0.070	NULL	NULL	NULL
Edit	Delete	Spearow	80	0.400	0.150	50	NULL	NULL
Edit	Delete	Ekans	70	0.400	0.150	50	NULL	NULL
Edit	Delete	Pikachu	70	0.160	0.100	50	NULL	NULL

(e) Update the existing rows in the table to add Attack and Defense information.

UPDATE PokemonGoData

SET Attack = 126, Defense = 126

WHERE Name= 'Bulbasaur';

UPDATE PokemonGoData

SET Attack = 128, Defense = 108

WHERE Name= 'Charmander';

UPDATE PokemonGoData

SET Attack = 160, Defense = 140

WHERE Name= 'Charmeleon';

UPDATE PokemonGoData

SET Attack = 112, Defense = 142

WHERE Name= 'Squirtle';

UPDATE PokemonGoData

SET Attack = 144, Defense = 176

WHERE Name= 'Wartortle';

UPDATE PokemonGoData

```
SET Attack = 62, Defense = 66  
WHERE Name= 'Caterpie';
```

```
UPDATE PokemonGoData  
SET Attack = 56, Defense = 86  
WHERE Name= 'Metapod';
```

```
UPDATE PokemonGoData  
SET Attack = 68, Defense = 64  
WHERE Name= 'Weedle';
```

```
UPDATE PokemonGoData  
SET Attack = 62, Defense = 82  
WHERE Name= 'Kakuna';
```

```
UPDATE PokemonGoData  
SET Attack = 94, Defense = 90  
WHERE Name= 'Pidgey';
```

```
UPDATE PokemonGoData  
SET Attack = 92, Defense = 86  
WHERE Name= 'Rattata';
```

```
UPDATE PokemonGoData  
SET Attack = 146, Defense = 150  
WHERE Name= 'Raticate';
```

```
UPDATE PokemonGoData  
SET Attack = 102, Defense = 78  
WHERE Name= 'Spearow';
```

```
UPDATE PokemonGoData  
SET Attack = 112, Defense = 112  
WHERE Name= 'Ekans';
```

```
UPDATE PokemonGoData  
SET Attack = 124, Defense = 108  
WHERE Name= 'Pikachu';
```

Actions		name	stamina	captureate	fleerate	candy	attack	defense
Edit	Delete	Bulbasaur	90	0.160	0.100	25	126	126
Edit	Delete	Charmander	78	0.160	0.100	25	128	108
Edit	Delete	Charmeleon	116	0.080	0.070	100	160	140
Edit	Delete	Squirtle	88	0.160	0.100	25	112	142
Edit	Delete	Wartortle	118	0.080	0.070	100	144	176
Edit	Delete	Caterpie	90	0.400	0.200	12	62	66
Edit	Delete	Metapod	100	0.200	0.090	50	56	86
Edit	Delete	Weedle	80	0.400	0.200	12	68	64
Edit	Delete	Kakuna	90	0.200	0.090	50	62	82
Edit	Delete	Pidgey	80	0.400	0.200	12	94	90
Edit	Delete	Rattata	60	0.400	0.200	25	92	86
Edit	Delete	Raticate	110	0.160	0.070	NULL	146	150
Edit	Delete	Spearow	80	0.400	0.150	50	102	78
Edit	Delete	Ekans	70	0.400	0.150	50	112	112
Edit	Delete	Pikachu	70	0.160	0.100	50	124	108

(f) Insert rows for characters with stamina equal to 120.

```
INSERT INTO PokemonGoData(Name, Stamina, Attack, Defense, CaptureRate, FleeRate, Candy)
VALUES ('Ivysaur', 120, 156, 158, 0.08, 0.07, 100);
```

```
INSERT INTO PokemonGoData(Name, Stamina, Attack, Defense, CaptureRate, FleeRate, Candy)
VALUES ('Butterfree', 120, 144, 144, 0.1, 0.06, NULL);
```

```
INSERT INTO PokemonGoData(Name, Stamina, Attack, Defense, CaptureRate, FleeRate, Candy)
VALUES ('Arbok', 120, 166, 166, 0.16, 0.07, NULL);
```

Actions		name	stamina	captureate	fleerate	candy	attack	defense
Edit	Delete	Bulbasaur	90	0.160	0.100	25	126	126
Edit	Delete	Charmander	78	0.160	0.100	25	128	108
Edit	Delete	Charmeleon	116	0.080	0.070	100	160	140
Edit	Delete	Squirtle	88	0.160	0.100	25	112	142
Edit	Delete	Wartortle	118	0.080	0.070	100	144	176
Edit	Delete	Caterpie	90	0.400	0.200	12	62	66
Edit	Delete	Metapod	100	0.200	0.090	50	56	86
Edit	Delete	Weedle	80	0.400	0.200	12	68	64
Edit	Delete	Kakuna	90	0.200	0.090	50	62	82
Edit	Delete	Pidgey	80	0.400	0.200	12	94	90
Edit	Delete	Rattata	60	0.400	0.200	25	92	86
Edit	Delete	Raticate	110	0.160	0.070	NULL	146	150
Edit	Delete	Spearow	80	0.400	0.150	50	102	78
Edit	Delete	Ekans	70	0.400	0.150	50	112	112
Edit	Delete	Pikachu	70	0.160	0.100	50	124	108
Edit	Delete	Ivysaur	120	0.080	0.070	100	156	158
Edit	Delete	Butterfree	120	0.100	0.060	NULL	144	144
Edit	Delete	Arbok	120	0.160	0.070	NULL	166	166

(g) Write a query to find all characters with attack greater than 150.

```
SELECT Name, Attack
FROM pokemongodata
WHERE Attack>150;
```

name	attack
Charmeleon	160
Ivysaur	156
Arbok	166

(h) Create a second table with Name and Quick Move information, with Name as a foreign key to the first table.

```
CREATE TABLE SecondTable
```

```
(
```

```
STID INT NOT NULL,
```

```
STName VARCHAR(20),
```



```
QuickMove VARCHAR(50),
```

```
PRIMARY KEY(STID),
```

```
FOREIGN KEY(STName) REFERENCES pokemongodata(Name)
```

```
);
```

	Table	Owner	Tablespace	Estimated row count	Actions										Comment
<input type="checkbox"/>	<a href="#">pokemongodata</a>	f17tdb1		0	<a href="#">Browse</a>	<a href="#">Select</a>	<a href="#">Insert</a>	<a href="#">Empty</a>	<a href="#">Alter</a>	<a href="#">Drop</a>	<a href="#">Vacuum</a>	<a href="#">Analyze</a>	<a href="#">Reindex</a>		
<input type="checkbox"/>	<a href="#">secondtable</a>	f17tdb1		0	<a href="#">Browse</a>	<a href="#">Select</a>	<a href="#">Insert</a>	<a href="#">Empty</a>	<a href="#">Alter</a>	<a href="#">Drop</a>	<a href="#">Vacuum</a>	<a href="#">Analyze</a>	<a href="#">Reindex</a>		

Column	Type	Not Null	Default	Constraints	Actions				Comment
<a href="#">stid</a>	integer	NOT NULL			<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
<a href="#">stname</a>	character varying(20)				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	
<a href="#">quickmove</a>	character varying(50)				<a href="#">Browse</a>	<a href="#">Alter</a>	<a href="#">Privileges</a>	<a href="#">Drop</a>	

(i) Insert rows in the second table corresponding to all characters in the first table. For characters with multiple moves, each move should be listed separately.

```
INSERT INTO secondtable
```

```
VALUES (1, 'Bulbasaur', 'Tackle');
```

```
INSERT INTO secondtable
```

```
VALUES (2, 'Bulbasaur', 'Vine Whip');
```

```
INSERT INTO secondtable
```

```
VALUES (3, 'Ivysaur', 'Razor Leaf');
```

```
INSERT INTO secondtable
```

```
VALUES (4, 'Ivysaur', 'Vine Whip');
```

```
INSERT INTO secondtable
```

```
VALUES (5, 'Charmander', 'Ember');
```

```
INSERT INTO secondtable
```

```
VALUES (6, 'Charmander', 'Scratch');
```

```
INSERT INTO secondtable
```

```
VALUES (7, 'Charmeleon', 'Ember');
```

```
INSERT INTO secondtable  
VALUES (8, 'Charmeleon', 'Scratch');
```

```
INSERT INTO secondtable  
VALUES (9, 'Squirtle', 'Bubble');
```

```
INSERT INTO secondtable  
VALUES (10, 'Squirtle', 'Tackle');
```

```
INSERT INTO secondtable  
VALUES (11, 'Wartortle', 'Bite');
```

```
INSERT INTO secondtable  
VALUES (12, 'Wartortle', 'Water Gun');
```

```
INSERT INTO secondtable  
VALUES (13, 'Caterpie', 'Tackle');
```

```
INSERT INTO secondtable  
VALUES (14, 'Caterpie', 'Bug Bite');
```

```
INSERT INTO secondtable  
VALUES (15, 'Metapod', 'Tackle');
```

```
INSERT INTO secondtable  
VALUES (16, 'Metapod', 'Bug Bite');
```

```
INSERT INTO secondtable  
VALUES (17, 'Butterfree', 'Bug Bite');
```

```
INSERT INTO secondtable  
VALUES (18, 'Butterfree', 'Confusion');
```

```
INSERT INTO secondtable  
VALUES (19, 'Weedle', 'Bug Bite');
```

```
INSERT INTO secondtable  
VALUES (20, 'Weedle', 'Poison Sting');
```

```
INSERT INTO secondtable  
VALUES (21, 'Kakuna', 'Bug Bite');
```

```
INSERT INTO secondtable
```

```
VALUES (22, 'Kakuna', 'Poison Sting');
```

```
INSERT INTO secondtable  
VALUES (23, 'Pidgey', 'Quick Attack');
```

```
INSERT INTO secondtable  
VALUES (24, 'Pidgey', 'Tackle');
```

```
INSERT INTO secondtable  
VALUES (25, 'Rattata', 'Tackle');
```

```
INSERT INTO secondtable  
VALUES (26, 'Rattata', 'Quick Attack');
```

```
INSERT INTO secondtable  
VALUES (27, 'Raticate', 'Bite');
```

```
INSERT INTO secondtable  
VALUES (28, 'Raticate', 'Quick Attack');
```

```
INSERT INTO secondtable  
VALUES (29, 'Spearow', 'Peck');
```

```
INSERT INTO secondtable  
VALUES (30, 'Spearow', 'Quick Attack');
```

```
INSERT INTO secondtable  
VALUES (31, 'Ekans', 'Acid');
```

```
INSERT INTO secondtable  
VALUES (32, 'Ekans', 'Poison Sting');
```

```
INSERT INTO secondtable  
VALUES (33, 'Arbok', 'Acid');
```

```
INSERT INTO secondtable  
VALUES (34, 'Arbok', 'Bite');
```

```
INSERT INTO secondtable  
VALUES (35, 'Pikachu', 'Quick Attack');
```

```
INSERT INTO secondtable  
VALUES (36, 'Pikachu', 'Thunder Shock');
```



Actions		stid	sname	quickmove
Edit	Delete	1	Bulbasaur	Tackle
Edit	Delete	2	Bulbasaur	Vine Whip
Edit	Delete	3	Ivysaur	Razor Leaf
Edit	Delete	4	Ivysaur	Vine Whip
Edit	Delete	5	Charmander	Ember
Edit	Delete	6	Charmander	Scratch
Edit	Delete	7	Charmeleon	Ember
Edit	Delete	8	Charmeleon	Scratch
Edit	Delete	9	Squirtle	Bubble
Edit	Delete	10	Squirtle	Tackle
Edit	Delete	11	Wartortle	Bite
Edit	Delete	12	Wartortle	Water Gun
Edit	Delete	13	Caterpie	Tackle
Edit	Delete	14	Caterpie	Bug Bite
Edit	Delete	15	Metapod	Tackle
Edit	Delete	16	Metapod	Bug Bite
Edit	Delete	17	Butterfree	Bug Bite
Edit	Delete	18	Butterfree	Confusion
Edit	Delete	19	Weedle	Bug Bite
Edit	Delete	20	Weedle	Poison Sting
Edit	Delete	21	Kakuna	Bug Bite
Edit	Delete	22	Kakuna	Poison Sting
Edit	Delete	23	Pidgey	Quick Attack
Edit	Delete	24	Pidgey	Tackle
Edit	Delete	25	Rattata	Tackle
Edit	Delete	26	Rattata	Quick Attack
Edit	Delete	27	Raticate	Bite
Edit	Delete	28	Raticate	Quick Attack
Edit	Delete	29	Spearow	Peck
Edit	Delete	30	Spearow	Quick Attack

Actions		stid	sname	quickmove
Edit	Delete	31	Ekans	Acid
Edit	Delete	32	Ekans	Poison Sting
Edit	Delete	33	Arbok	Acid
Edit	Delete	34	Arbok	Bite
Edit	Delete	35	Pikachu	Quick Attack
Edit	Delete	36	Pikachu	Thunder Shock

(j) What happens if you try to insert Tackle as a move for Venusaur?

INSERT INTO secondtable

VALUES (37, 'Venusaur', 'Tackle');

SQL error:

ERROR: insert or update on table "secondtable" violates foreign key constraint "secondtable\_stname\_fkey"  
DETAIL: Key (stname)=(Venusaur) is not present in table "pokemongodata".

In statement:  
INSERT INTO secondtable  
VALUES (37, 'Venusaur', 'Tackle');

(k) What happens if you try to delete the row in first table for Weedle?

```
DELETE FROM pokemongodata  
WHERE Name = 'Weedle';
```

SQL error:

ERROR: update or delete on table "pokemongodata" violates foreign key constraint "secondtable\_stname\_fkey" on table "secondtable"  
DETAIL: Key (name)=(Weedle) is still referenced from table "secondtable".

In statement:  
DELETE FROM pokemongodata  
WHERE Name = 'Weedle';

(l) Write a query to find the average attack of all characters with the Bug Bite move.

```
SELECT ST.quickmove, AVG(attack)  
FROM pokemongodata P, secondtable ST  
WHERE P.Name = ST.stname AND ST.quickmove = 'Bug Bite'  
GROUP BY ST.quickmove  
;
```

quickmove	avg
Bug Bite	78.4000000000000000

## Part II

(a) Find the salary for all agents with last name DiLiberty.

$\pi_{\text{salary}} (\sigma_{\text{last} = \text{'DiLiberty'}} \text{Agent})$

(b) List agent ID and country of all agents with the Locksmith skill.

$\pi_{A.\text{agent\_id}, A.\text{country}} (\sigma_{S.\text{skill} = \text{'Locksmith'}, A.\text{agent\_id} = SR.\text{agent\_id}, SR.\text{skill\_id} = S.\text{skill\_id}} (\text{Agent } A \times \text{SkillRel } SR \times \text{Skill } S))$

(c) List the agent ID, salary and clearance description of all agents who speak Vietnamese.

$\pi_{A.\text{agent\_id}, A.\text{salary}, SC.\text{description}} (\sigma_{L.\text{Language} = \text{'Vietnamese'}, SC.\text{sc\_id} = A.\text{clearance\_id}, A.\text{agent\_id} = LR.\text{agent\_id}, LR.\text{lang\_id} = L.\text{lang\_id}} (\text{Securityclearance } SC \times \text{Agent } A \times \text{Languagerel } LR \times \text{Language } L))$

## Part III

(a) (5 points) Find the agent id and salary in Euros for all agents whose country is Germany. Name the result columns German\_ids and Euro\_pay. (Assume the salary column is US dollars.)

1 US Dollar equals 0.84 Euro

```

SELECT agent_id AS German_ids, salary*0.84 AS Euro_pay
FROM agent
WHERE country = 'Germany'
;

```

Total number of rows: 4

german_ids	euro_pay
149	66278.52
319	57030.96
366	42148.68
554	60196.08

(b) (5 points) Find the number of different affiliations.

```

SELECT COUNT(DISTINCT title)
FROM affiliation
;

```

Total number of rows: 1

count
34

(c) (5 points) Find the high, low and average salary for all agents with the Pilot skill.

```

SELECT MAX(salary), MIN(salary), AVG(salary)
FROM Agent A, SkillRel SR, Skill S
WHERE A.agent_id = SR.agent_id AND SR.skill_id = S.skill_id
AND S.skill = 'Pilot';

```

Total number of rows: 1

max	min	avg
361440	50282	103087.976744186047

(d) (10 points) Find the team name for all teams with at least one agent who has FBI affiliation.

Do this query two ways: Once using NATURAL JOIN and once without any JOIN operator in the FROM clause.

```

SELECT DISTINCT T.name
FROM Team T NATURAL JOIN Teamrel TR NATURAL JOIN Agent A NATURAL JOIN
Affiliationrel AFR NATURAL JOIN affiliation AF
WHERE AF.title = 'FBI'
;

```

```

SELECT DISTINCT T.name
FROM Team T, Teamrel TR, Agent A, Affiliationrel AFR, affiliation AF
WHERE T.team_id = TR.team_id
AND TR.agent_id = A.agent_id
AND A.agent_id = AFR.agent_id
AND AFR.aff_id = AF.aff_id
AND AF.title = 'FBI'
;

```

Total number of rows: 15

name
Boat Team 1
Cyclone
Swing Voters
Widow Makers
Jester

(e) (5 points) List the affiliations for each agent, including agents with no affiliation. The result should have last name, city, agent\_id and affiliation description.

```

SELECT A.last, A.city, A.agent_id, AF.description
FROM Agent A LEFT OUTER JOIN Affiliationrel AFR ON A.agent_id = AFR.agent_id
LEFT OUTER JOIN affiliation AF ON AFR.aff_id = AF.aff_id
;

```

Total number of rows: 1114

last	city	agent_id	description
Bundt	Paris	2	Russian Foreign Intelligence
Cohen	New York	3	International Police Organisation
Fairley	New York	5	Security Service of Ukraine
Fairley	New York	5	Secret terrorist group in Sicily
Heeman	San Francisco	7	Dutch Military Intelligence

(f) (10 points) List the team name for each team that has an agent who can speak Spanish and an agent with who can speak Arabic. Do this query twice: Once using INTERSECT and once without using that operator.

```

SELECT DISTINCT T.name
FROM Team T, Teamrel TR, Agent A, Languagerel LR, Language L
WHERE T.team_id = TR.team_id
AND TR.agent_id = A.agent_id
AND A.agent_id = LR.agent_id
AND LR.lang_id = L.lang_id
AND L.Language = 'Spanish'

```

INTERSECT

```

SELECT DISTINCT T.name
FROM Team T, Teamrel TR, Agent A, Languagerel LR, Language L
WHERE T.team_id = TR.team_id
AND TR.agent_id = A.agent_id
AND A.agent_id = LR.agent_id
AND LR.lang_id = L.lang_id
AND L.Language = 'Arabic'
;

```

---

Reference: Discussed Question Part III (f) with Zhan Li

```

SELECT One.name
FROM
(SELECT DISTINCT T.name
FROM Team T, Teamrel TR, Agent A, Languagerel LR, Language L
WHERE T.team_id = TR.team_id
AND TR.agent_id = A.agent_id
AND A.agent_id = LR.agent_id
AND LR.lang_id = L.lang_id
AND L.Language = 'Spanish') One,

```

```

(SELECT DISTINCT T.name
FROM Team T, Teamrel TR, Agent A, Languagerel LR, Language L
WHERE T.team_id = TR.team_id
AND TR.agent_id = A.agent_id
AND A.agent_id = LR.agent_id
AND LR.lang_id = L.lang_id
AND L.Language = 'Arabic') Two
WHERE One.name = Two.name
;

```

Total number of rows: 31

name
Renegade
Roadkill
Giraffe
Blue Dagger
Boat Team 4

(g) (10 points) Find all agents who speak Bengali or have the Locksmith skill. Do this query twice: Once using UNION and once without using that operator.

```

SELECT A.agent_id, A.first, A.last, L.language
FROM Agent A, Languagerel LR, Language L
WHERE A.agent_id = LR.agent_id

```

```
AND LR.lang_id = L.lang_id
AND L.Language = 'Bengali'
```

```
UNION
```

```
SELECT A.agent_id, A.first, A.last, S.skill
FROM Agent A, SkillRel SR, Skill S
WHERE A.agent_id = SR.agent_id AND SR.skill_id = S.skill_id
AND S.skill = 'Locksmith';
```

---

```
SELECT A.agent_id, A.first, A.last, L.language INTO Temp1
FROM Agent A, Languagerel LR, Language L
WHERE A.agent_id = LR.agent_id
AND LR.lang_id = L.lang_id
AND L.Language = 'Bengali';
```

```
INSERT INTO Temp1 (agent_id, first, last, language)
SELECT A.agent_id, A.first, A.last, S.skill
FROM Agent A, SkillRel SR, Skill S
WHERE A.agent_id = SR.agent_id AND SR.skill_id = S.skill_id
AND S.skill = 'Locksmith';
```

```
SELECT *
FROM Temp1;
```

Total number of rows:137

agent_id	first	last	language
563	George	Fast	Bengali
857	George	Alvarado	Bengali
315	George	Kottler	Bengali
780	James	DeMint	Bengali
24	Chris	Leen	Bengali
89	George	Frazier	Bengali
470	Elias	Gailey	Bengali
1013	George	Griffin	Bengali
749	Tim	Thune	Bengali
793	Jim	Dorgan	Bengali
481	Steve	Taube	Bengali
526	Steve	Gozansky	Locksmith
771	Thomas	Thomas	Bengali