

# CPSC 471: Assignment 4

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## Question 1

1. Find the ISBN, title and total quantity of yellow books that are published by publishers located in Vancouver and distributed only to schools located in Toronto.

```
SELECT Book.ISBN, Book.title, Distribute.quantity
FROM Book, Distribute
WHERE color = "Yellow"
AND Distribute.ISBN = Book.ISBN
AND Distribute.pname IN (
    SELECT name FROM Publisher
    WHERE city = "Vancouver"
)
AND Book.ISBN NOT IN (
    SELECT ISBN FROM Distribute, School
    WHERE sname = name
    AND city != "Toronto"
);
```

2. Find the names and directors of schools located in Edmonton and receive books titled 'The Lost Tribe' from publishers located in Montreal.

```
SELECT name, director
FROM School
WHERE city = "Edmonton"
AND name IN (
    SELECT sname FROM Distribute JOIN Publisher
    WHERE pname = Publisher.name
    AND sname = School.name
    AND city = "Montreal"
);
```

3. Find the title and total quantity of each book distributed to all schools located in the same city as the publisher.

```
SELECT title, SUM(quantity)
FROM Book AS B, Distribute AS D, Publisher AS P, School AS S
WHERE B.ISBN = D.ISBN
AND D.pname = P.name
AND D.sname = S.name
AND P.city = S.city
GROUP BY B.ISBN;
```

4. Find the names and cities of the publishers who distribute books only to schools located in Calgary and distribute books to every school in Calgary.

```
SELECT name, city
FROM Publisher AS P
WHERE NOT EXISTS (
    SELECT * FROM Distribute AS D, School AS S
    WHERE D.pname = P.name
    AND D.sname = S.name
    AND S.city != "Calgary"
)

INTERSECT

SELECT name, city
FROM Publisher AS P
WHERE NOT EXISTS (
    SELECT * FROM School AS S
    WHERE S.city = "Calgary"
    AND NOT EXISTS (
        SELECT * FROM Distribute AS D
        WHERE D.sname = S.name
        AND D.pname = P.name
    )
);
```

5. Find the ISBN and title of books distributed to schools located in Ottawa and never distributed to schools located in Windsor.

```
SELECT ISBN, title
FROM Book
WHERE ISBN IN (
    SELECT ISBN
    FROM Distribute JOIN School
    WHERE sname = name
    AND city = "Ottawa"
)
AND ISBN NOT IN (
    SELECT ISBN
    FROM Distribute JOIN School
    WHERE sname = name
    AND city = "Windsor"
);
```

## Question 2

1. Find the names of persons who own at least one house in at least one city of at least one country that has a border with Canada.

```
SELECT DISTINCT ownerName
FROM HOUSE
WHERE stno IN (
    SELECT stno
    FROM Street
    WHERE cityName IN (
        SELECT cityName
        FROM City
        WHERE countryName!="Canada"
        AND countryName IN (
            SELECT countryName1
            FROM Border
            WHERE countryName2 = "Canada"
        )
    )
    OR countryName IN (
        SELECT countryName2
        FROM Border
        WHERE countryName1 = "Canada"
    )
);
```

2. Find street number and city name of the shortest street in each city in every country that has border with Canada.

```
SELECT stno, cityName
FROM Street AS S
WHERE cityName IN (
    SELECT cityName
    FROM City
    WHERE countryName != "Canada"
    AND countryName IN (
        SELECT countryName1
        FROM Border
        WHERE countryName2 = "Canada"
    )
    OR countryName IN (
        SELECT countryName2
        FROM Border
        WHERE countryName1 = "Canada"
    )
)
AND NOT EXISTS (
    SELECT *
    FROM Street AS T
    WHERE T.length < S.length
    AND T.cityName = S.cityName
);
```

3. Find the names and population sizes of all countries that have a border with the USA.

```
SELECT name, population
FROM Country
WHERE name != "USA"
AND name IN (
    SELECT countryName1
    FROM Border
    WHERE countryName2 = "USA"
)
OR name IN (
    SELECT countryName2
    FROM Border
    WHERE countryName1 = "USA"
);
```

4. Find the names of persons who do not own any houses in Canada but own more than one house in the USA.

```
SELECT DISTINCT H.ownerName
FROM House AS H
WHERE H.stno IN (
    SELECT stno
    FROM Street
    WHERE cityName IN (
        SELECT cityName
        FROM City
        WHERE countryName="USA"
    )
)
AND EXISTS (
    SELECT * FROM House AS H2
    WHERE H2.ownerName = H.ownerName
    AND H2.stno IN (
        SELECT stno
        FROM Street
        WHERE cityName IN (
            SELECT cityName
            FROM City
            WHERE countryName="USA"
        )
    )
    AND H.hno != H2.hno
)
EXCEPT (
    SELECT ownerName
    FROM House
    WHERE stno IN (
        SELECT stno
        FROM Street
        WHERE cityName IN (
            SELECT cityName
            FROM City
            WHERE countryName="Canada"
        )
    )
);
```

5. Find the names and areas of cities with at least one street where no house is located.

```
SELECT cityName, area
FROM City
WHERE cityName IN (
    SELECT cityName
    FROM Street AS S
    WHERE NOT EXISTS (
        SELECT *
        FROM House AS H
        WHERE H.stno = S.stno
    )
);
```