Here are some relations that exist in a database for an orchestra.

Person(email, name, age)
- This relation stores anyone who has signed up for our mailing list. Tuples in this relation may not be listed in Purchase.

Show(id, year, month, day, showing, attendanceNumber)
- Showing describes whether a show was during morning, afternoon, or evening
- {year, month, day, showing} is a candidate key for Show

Song(composer, title)

SongsPerformed(**showID**, **composer**, **title**)
- showID is a foreign key referring to Show
- composer and title are foreign keys referring to attributes of the same name in Song

Purchase(**email**, **showID**, price)
- email is a foreign key referring to the email attribute in Person
- showID is a foreign key referring to Show

Musician(id, name, instrument, position, nationality)

PerformedIn(**id**, **showID**)
- id refers to the attribute of the same name in Musician
- showID is a foreign key referring to Show

Write SQL statements to answer the following questions:

1. Use the INTERSECT operator for the following question.

   Find the showIDs of shows where the symphony performed songs by Mozart and Beethoven.
   Another way to think about this question: Find the shows where at least one song composed by Mozart and at least one song composed by Beethoven were performed.

   SELECT DISTINCT sp1.showID FROM SongsPerformed sp1 WHERE sp1.composer = 'Mozart'

   INTERSECT

   SELECT DISTINCT sp2.showID FROM SongsPerformed sp2 WHERE sp2.composer = 'Beethoven'

   Note: You don't necessarily need DISTINCT as INTERSECT will remove duplicates.

2. Write a query to solve question 1 but this time, do not use the INTERSECT query. If this is not possible, explain why.

```
SELECT DISTINCT sp1.showID
FROM SongsPerformed sp1, SongsPerformed sp2
WHERE sp1.showID = sp2.showID AND sp1.composer = 'Mozart' AND
        sp2.composer = 'Beethoven'
```

3. Write a query to solve question 1 with the EXISTS/NOT EXISTS operator. If this is not possible, explain why.

```
SELECT DISTINCT sp1.showID
FROM SongsPerformed sp1
WHERE sp1.composer = 'Mozart' AND EXISTS (SELECT *
                                          FROM SongsPerformed sp2
                                          WHERE sp2.composer = 'Beethoven' AND
                                                sp1.showID = sp2.showID)
```

4. Write a query to solve question 1 with the IN/NOT IN operator. If this is not possible, explain why.

```
SELECT DISTINCT sp1.showID
FROM SongsPerformed sp1
WHERE sp1.composer = 'Mozart' AND sp1.showID IN
                                  (SELECT DISTINCT sp2.showID
                                   FROM SongsPerformed sp2
                                   WHERE sp2.composer = 'Beethoven')
```