



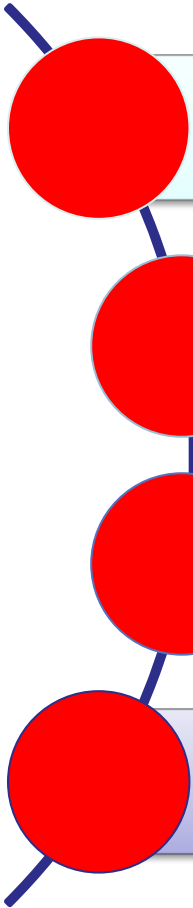
Module 12

Advanced Query Formulation with SQL

Lesson 3: Membership Exception Problem



Lesson Objectives

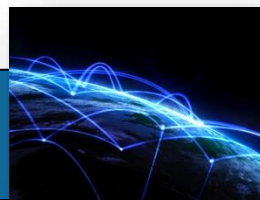


Define the membership exception problem and indicate its importance and prevalence

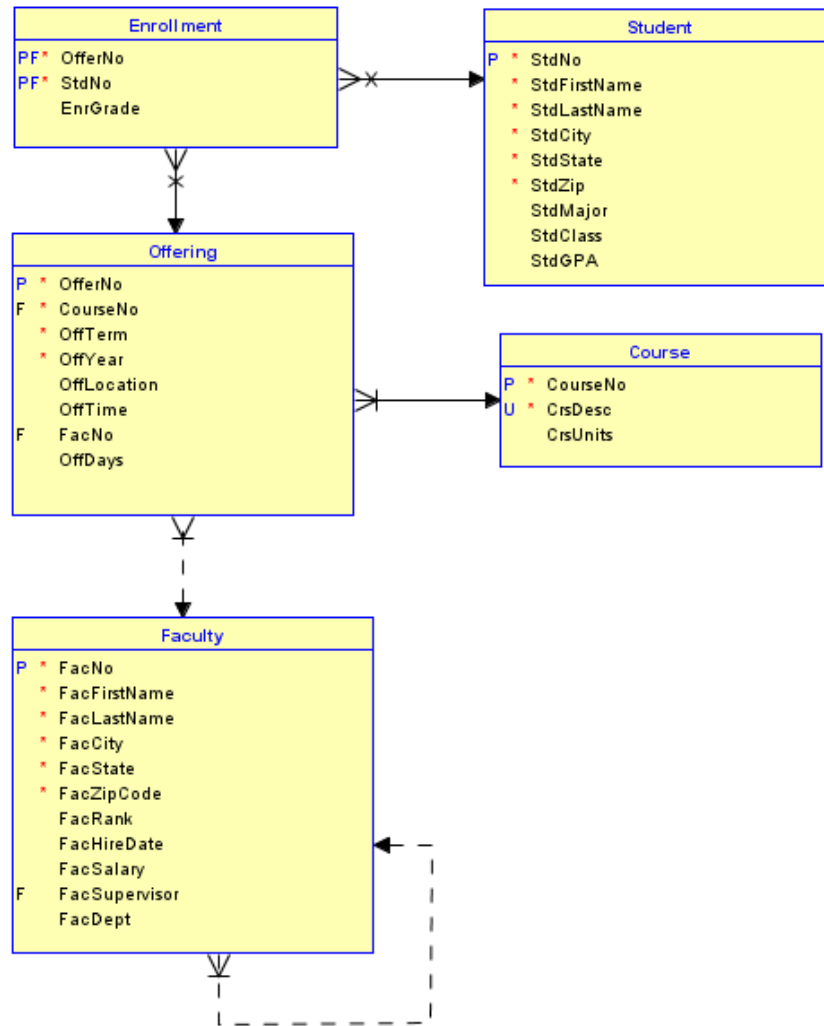
Apply the text pattern to detect problem statements with membership exceptions

Apply the statement pattern to write template statements for membership exception problems

Write SELECT statements for basic and extended membership exception problems



University Database Diagram



Membership Exceptions as Difference Problems

Difference relationships

- Dependent sets related by 1-M relationships such as courses and offerings
- Independent sets such as businesses and business taxpayers

Membership exceptions

- Exception for exclusive membership in one set
- Typical problem of childless parents such as courses without offerings
- Less common for exceptions among independent sets



Text Pattern

Non membership (exclusivity) in the problem statement

- Exclusivity words connecting prominent nouns
- Typical connection words as not, only, never
- Nouns representing independent or dependent sets

Examples

- Faculty not teaching spring 2021 courses
- Commercial water users who are not business taxpayers.



NOT IN Statement Pattern

```
SELECT <ParentTableColumns> [, <RelatedTableColumns>]
FROM <ParentTable> [, <RelatedTables>]
WHERE [ <JoinConditions> ]
[ AND <OtherConditions> ]
AND <ParentPK> NOT IN
    ( SELECT <ChildFK> FROM <ChildTable>
      [ WHERE <ChildRowConditions> ] );
```



Basic Example

Example 1: Retrieve courses not offered

```
SELECT CourseNo, CrsDesc, CrsUnits  
FROM Course  
WHERE CourseNo NOT IN  
  ( SELECT CourseNo FROM Offering );
```



Extended Example

Example 2: Retrieve finance courses not offered in summer 2019

```
SELECT CourseNo, CrsDesc, CrsUnits
FROM Course
WHERE CourseNo LIKE 'FIN%'
      AND CourseNo NOT IN
      ( SELECT CourseNo
        FROM Offering
        WHERE OffTerm = 'SUMMER'
          AND OffYear = 2019 );
```



Advanced Example

Example 3: Retrieve details of courses only taught in winter terms

```
SELECT DISTINCT Course.CourseNo, CrsDesc,  
                CrsUnits  
FROM Course, Offering  
WHERE Course.CourseNo = Offering.CourseNo  
      AND OffTerm = 'WINTER'  
      AND Course.CourseNo NOT IN  
      ( SELECT CourseNo FROM Offering  
        WHERE OffTerm <> 'WINTER' );
```



Summary

Exclusivity in set membership among dependent or independent sets as exception reporting

Text patterns using a negation word connecting prominent nouns

Statement pattern using the NOT IN operator with a Type I nested query

Other statement patterns with more complexity or usage restrictions

