

CS122 Using Relational Databases and SQL
Views, Temporary Tables, and More Subqueries

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View

- ◆ A virtual table
 - Defined by a query
 - Derives data from the *base* table(s)
 - The data in a view is not stored physically
- ◆ Can be queried and sometimes updated

View Declaration

- ◆ In MS Access
 - Save a query
- ◆ In some other databases
 - `CREATE VIEW view_name AS query;`

Temporary Table

```
SELECT ... INTO temp_tbl_name ...;
```

- ◆ A easier way to create a table
- ◆ A temporary table is a table (not a view)

Questions about Views and Temporary Tables

- ◆ When do we want to create a view?
- ◆ When can we update data through a view?
- ◆ How do we choose between a view and a temporary table?

Join and Subqueries

- ◆ Find the name of the person who is working on Project 'A2'
 - Using join
 - Using subquery

Join vs. Subquery

- ◆ When can we turn a join into a subquery?
- ◆ When do we want to turn a join into a subquery?
 - Readability
 - Performance

Correlated Subquery

```
SELECT s.name FROM Student s WHERE s.stno IN  
(SELECT gr.student_number FROM Grade_report gr  
WHERE gr.grade = 'A');
```

```
SELECT s.name FROM Student s WHERE s.stno IN  
(SELECT gr.student_number FROM Grade_report gr  
WHERE gr.grade = 'A'  
AND gr.student_number = s.stno);
```

Query Execution

- ◆ Non-correlated
 - Run the subquery once
 - For each row of the out query, check it against the results of the subquery
- ◆ Correlated
 - For each row of the outer query
 - Check the result of the subquery using the row as a condition of the subquery

EXISTS

EXISTS (subquery)

- ◆ *TRUE* if the subquery returns at least one row, and *FALSE* otherwise

EXISTS Example

- ◆ Find the names of the students who have got at least one C grade

NOT EXIST Example 1

- ◆ Find the names of the students who have not got C grade

```
SELECT s.sname FROM Student s WHERE NOT EXIST  
(SELECT 1 FROM Grade_report gr WHERE  
s.stno = gr.student_number AND gr.grade = 'C');
```

NOT EXISTS Example 2

◆ Find the language(s) spoken by all students

```
For each language
  For each student
    If <student, language> is not in Cap,
      language is not a result
```

NOT EXIST Example 3

◆ Find the students who speaks all languages

```
For each student
  For each language
    If <student, language> is not in Cap,
      language is not a result
```