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

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

```sql
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 outer 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

```sql
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