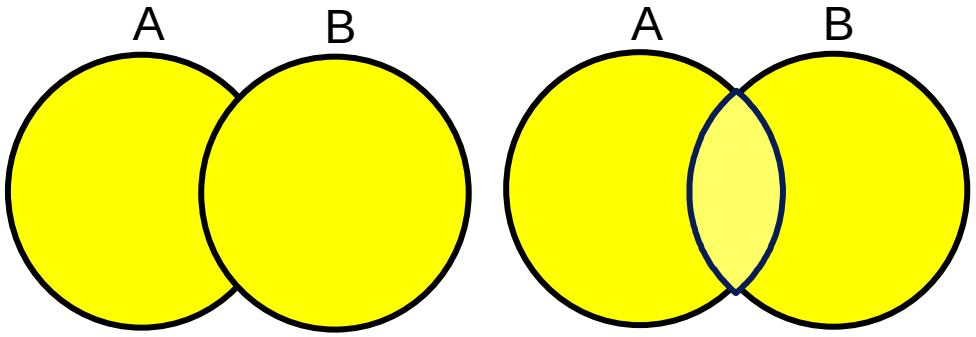
Using the Set Operators

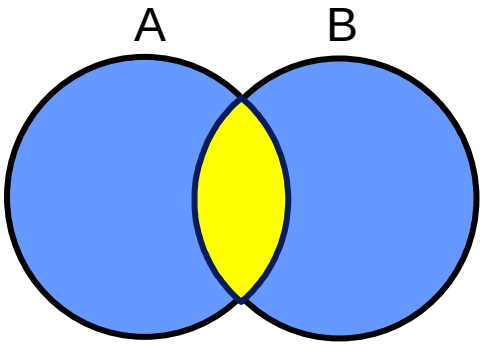
Objectives

- After completing this lesson, you should be able to do the following:
  - Describe set operators
  - Use a set operator to combine multiple queries into a single query
  - Control the order of rows returned

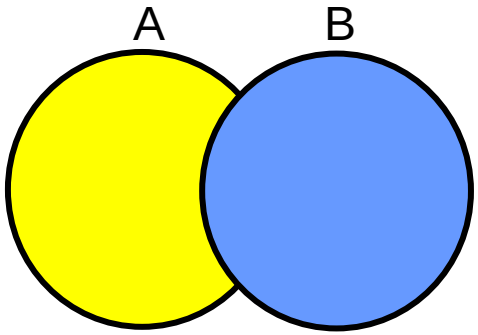
Set Operators



UNION/UNION ALL



INTERSECT



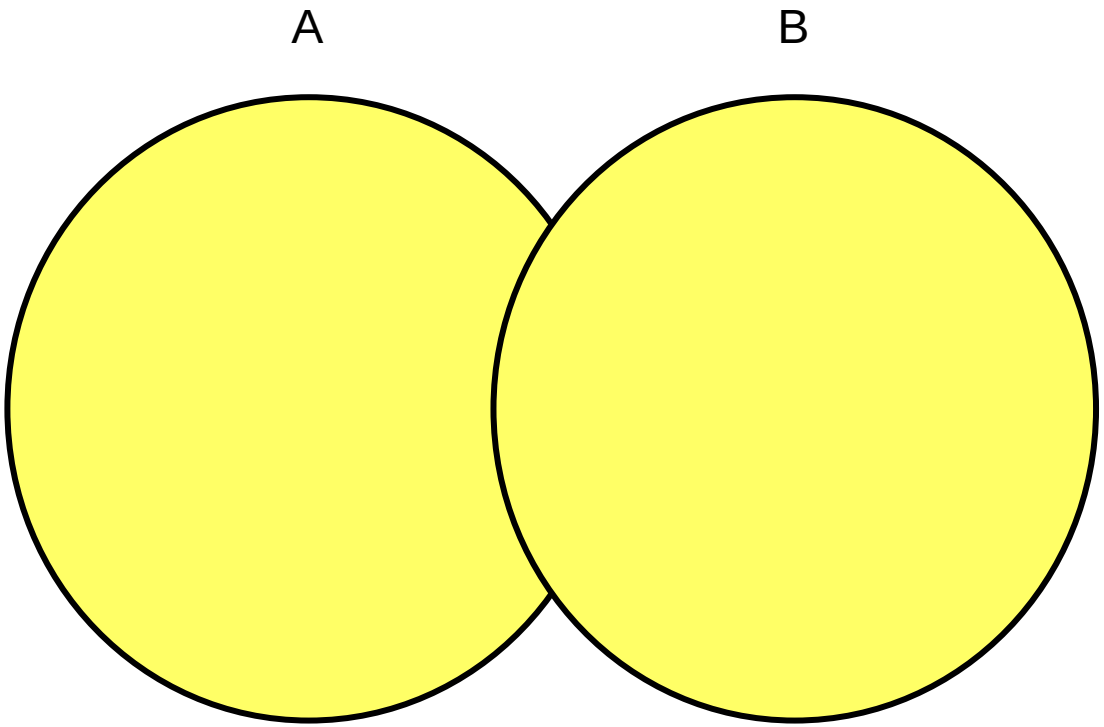
MINUS

Tables Used in This Lesson

- The tables used in this lesson are:
  - **EMPLOYEES**: Provides details regarding all current employees
  - **JOB_HISTORY**: Records the details of the start date and end date of the former job, and the job identification number and department when an employee switches jobs

When an employee switches jobs, the details of the start date and end date of the former job, the job identification number, and the department are recorded in the `JOB_HISTORY` table.

`UNION` Operator



The `UNION` operator returns results from both queries after **eliminating duplications**.

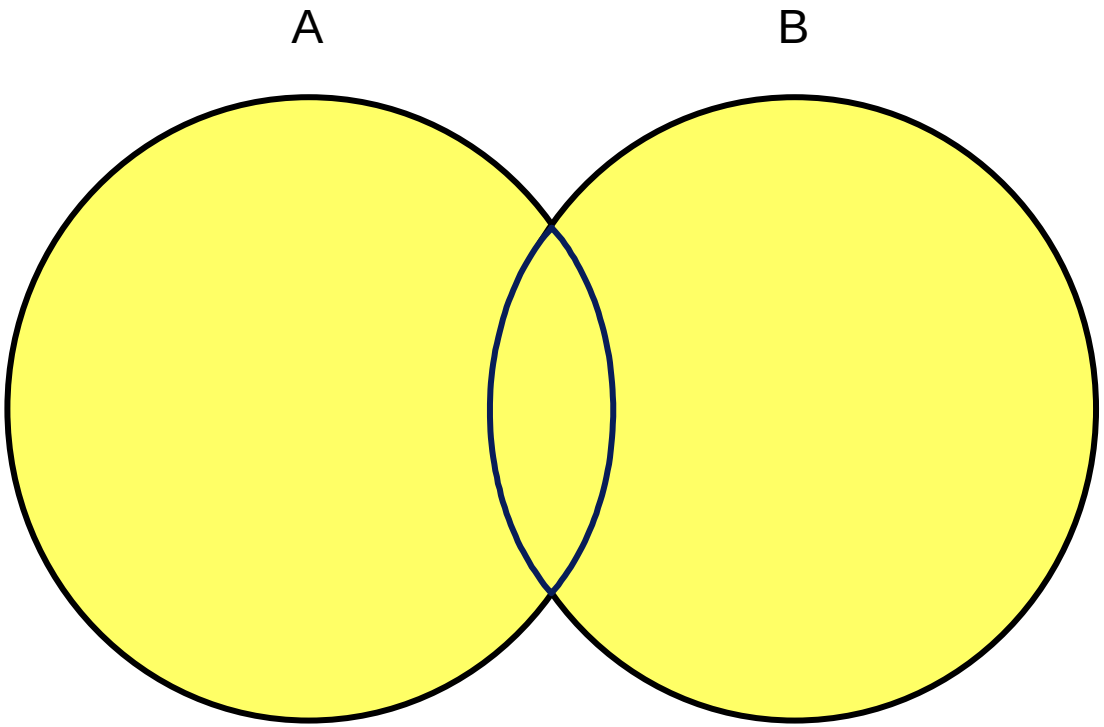
Using the UNION Operator

- Display the current and previous job details of all employees. Display each employee only once.

```
SELECT employee_id, job_id
FROM   employees
UNION
SELECT employee_id, job_id
FROM   job_history;
```

EMPLOYEE_ID	JOB_ID
100	AD_PRES
101	AC_ACCOUNT
...	
200	AC_ACCOUNT
200	AD_ASST
...	
205	AC_MGR
206	AC_ACCOUNT

UNION ALL Operator



The UNION ALL operator returns results from both queries, **including all duplications**.

Using the UNION ALL Operator

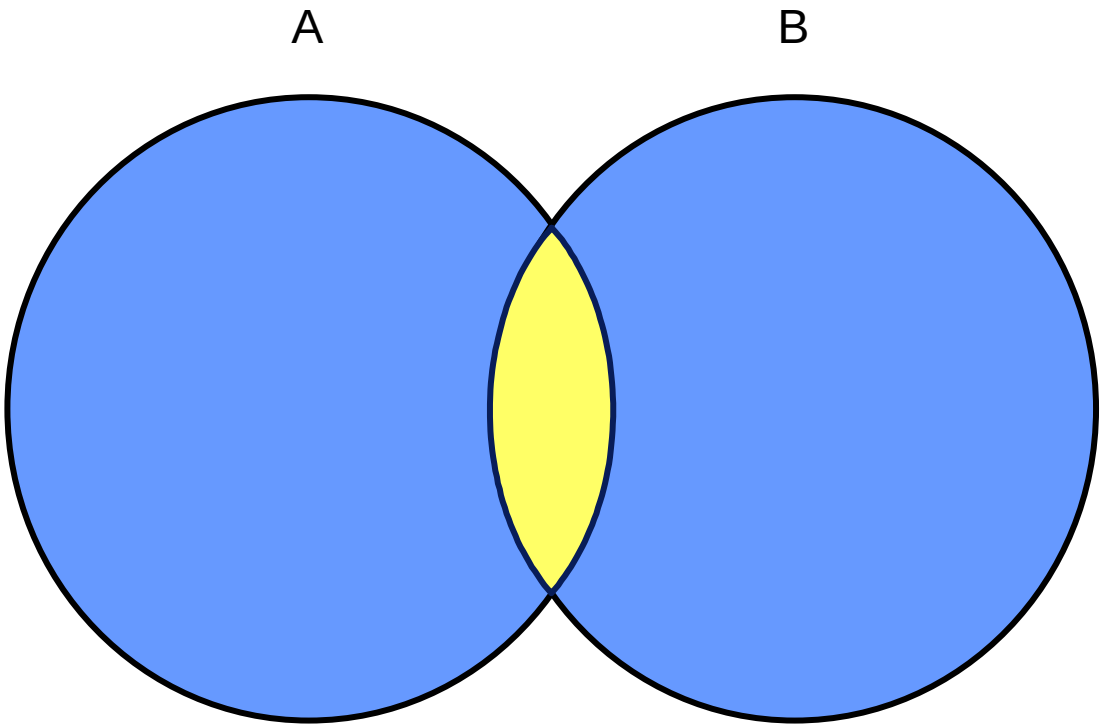
- Display the current and previous departments of all employees.

```
SELECT employee_id, job_id, department_id
FROM   employees
UNION ALL
SELECT employee_id, job_id, department_id
FROM   job_history
ORDER BY  employee_id;
```

EMPLOYEE_ID	JOB_ID	DEPARTMENT_ID
100	AD_PRES	90
101	AD_VP	90
...		
200	AD_ASST	10
200	AD_ASST	90
200	AC_ACCOUNT	90
...		
205	AC_MGR	110
206	AC_ACCOUNT	110

30 rows selected.

INTERSECT Operator



The **INTERSECT** operator returns rows that are common to both queries.

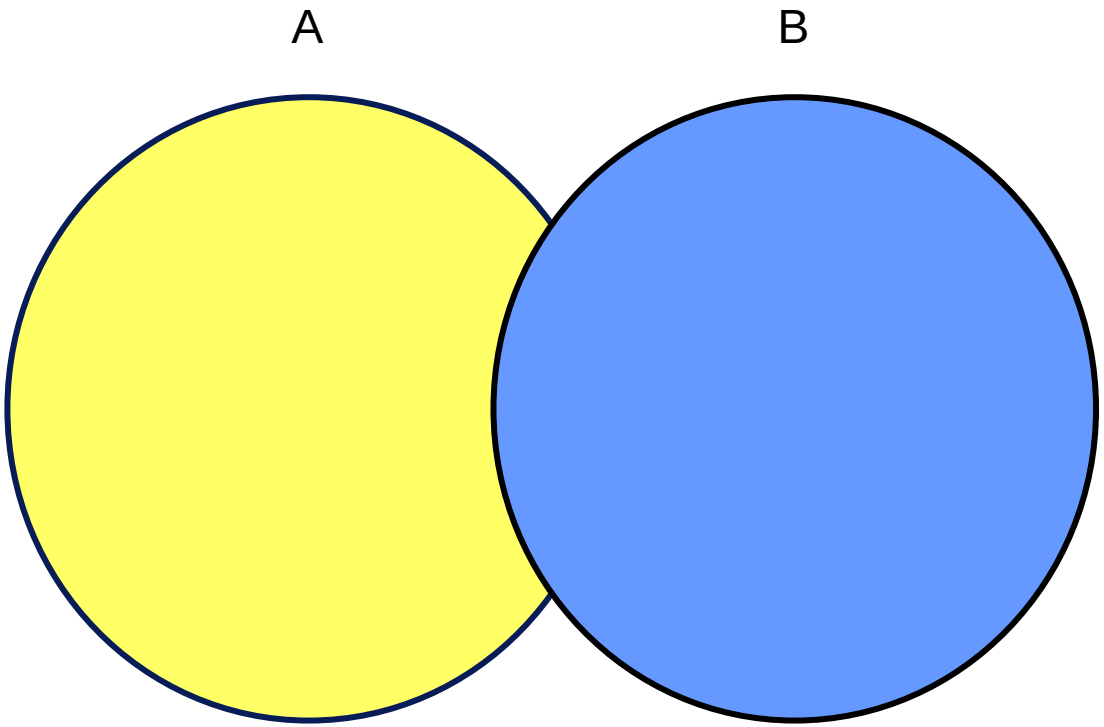
Using the INTERSECT Operator

- Display the employee IDs and job IDs of those employees who currently have a job title that is the same as their job title when they were initially hired (that is, they changed jobs but have now gone back to doing their original job).

```
SELECT employee_id, job_id
FROM   employees
INTERSECT
SELECT employee_id, job_id
FROM   job_history;
```

EMPLOYEE_ID	JOB_ID
176	SA_REP
200	AD_ASST

MINUS Operator



The **MINUS** operator returns rows in the first query that are not present in the second query.

MINUS Operator

Display the employee IDs of those employees who have not changed their jobs even once.

```
SELECT employee_id,job_id
FROM   employees
MINUS
SELECT employee_id,job_id
FROM   job_history;
```

EMPLOYEE_ID	JOB_ID
100	AD_PRES
101	AD_VP
102	AD_VP
103	IT_PROG
...	
201	MK_MAN
202	MK_REP
205	AC_MGR
206	AC_ACCOUNT

18 rows selected.

Set Operator Guidelines

- The expressions in the `SELECT` lists must **match in number and data type**.
- Parentheses can be used to alter the sequence of execution.
- The `ORDER BY` clause:
  - Can appear only at the very end of the statement
  - Will accept the column name, aliases from the first `SELECT` statement, or the positional notation

The Oracle Server and Set Operators

- Duplicate rows are automatically eliminated except in `UNION ALL`.
- Column names from the first query appear in the result.
- The output is sorted in ascending order by default except in `UNION ALL`.

Matching the SELECT Statements

- Using the UNION operator, display the department ID, location, and hire date for all employees.

```
SELECT department_id, TO_NUMBER(null)
       location, hire_date
FROM   employees
UNION
SELECT department_id, location_id,  TO_DATE(null)
FROM   departments;
```

DEPARTMENT_ID	LOCATION	HIRE_DATE
10	1700	
10		17-SEP-87
20	1800	
20		17-FEB-96
...		
110	1700	
110		07-JUN-94
190	1700	
		24-MAY-99

27 rows selected.

Matching the SELECT Statement: Example

- Using the UNION operator, display the employee ID, job ID, and salary of all employees.

```
SELECT employee_id, job_id,salary
FROM   employees
UNION
SELECT employee_id, job_id,0
FROM   job_history;
```

EMPLOYEE_ID	JOB_ID	SALARY
100	AD_PRES	24000
101	AC_ACCOUNT	0
101	AC_MGR	0
...		
205	AC_MGR	12000
206	AC_ACCOUNT	8300

30 rows selected.

Controlling the Order of Rows

- Produce an English sentence using two `UNION` operators.
- (Run as a script, not as a single statement.)

```
COLUMN a_dummy NOPRINT
SELECT 'sing' AS "My dream", 3 a_dummy
FROM dual
UNION
SELECT 'I''d like to teach', 1 a_dummy
FROM dual
UNION
SELECT 'the world to', 2 a_dummy
FROM dual
ORDER BY a_dummy;
```

My dream
I'd like to teach
the world to
sing

Summary

- In this lesson, you should have learned how to:
  - Use `UNION` to return all distinct rows
  - Use `UNION ALL` to return all rows, including duplicates
  - Use `INTERSECT` to return all rows that are shared by both queries
  - Use `MINUS` to return all distinct rows that are selected by the first query but not by the second
  - Use `ORDER BY` only at the very end of the statement