

COMP 353 - Databases

3rd Session of Lab XJ

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Primary Key

A primary key is a special field in the relational table that is used to identify each record

Main Features:

- Not null
- Unique

Examples:

Creating a customers table with a unique id

Creating a passengers table with a unique passport number

Foreign Key

A foreign key is a key used to link two tables together

It is field/collection of fields in one table that refers to the primary key in another table

Different behaviours in foreign key modification:

- Restricted
- No Action
- Cascade

Create two tables : orders, items with the indicated behaviours

Where conditions

We can use more keywords in the where condition to build more complex queries

And | OR | NOT

- The AND operator displays a record if all the conditions separated by AND are TRUE.
- The OR operator displays a record if any of the conditions separated by OR is TRUE.
- The NOT operator displays a record if the condition(s) is NOT TRUE.

Subqueries (will be discussed in the coming sessions!)

Joins

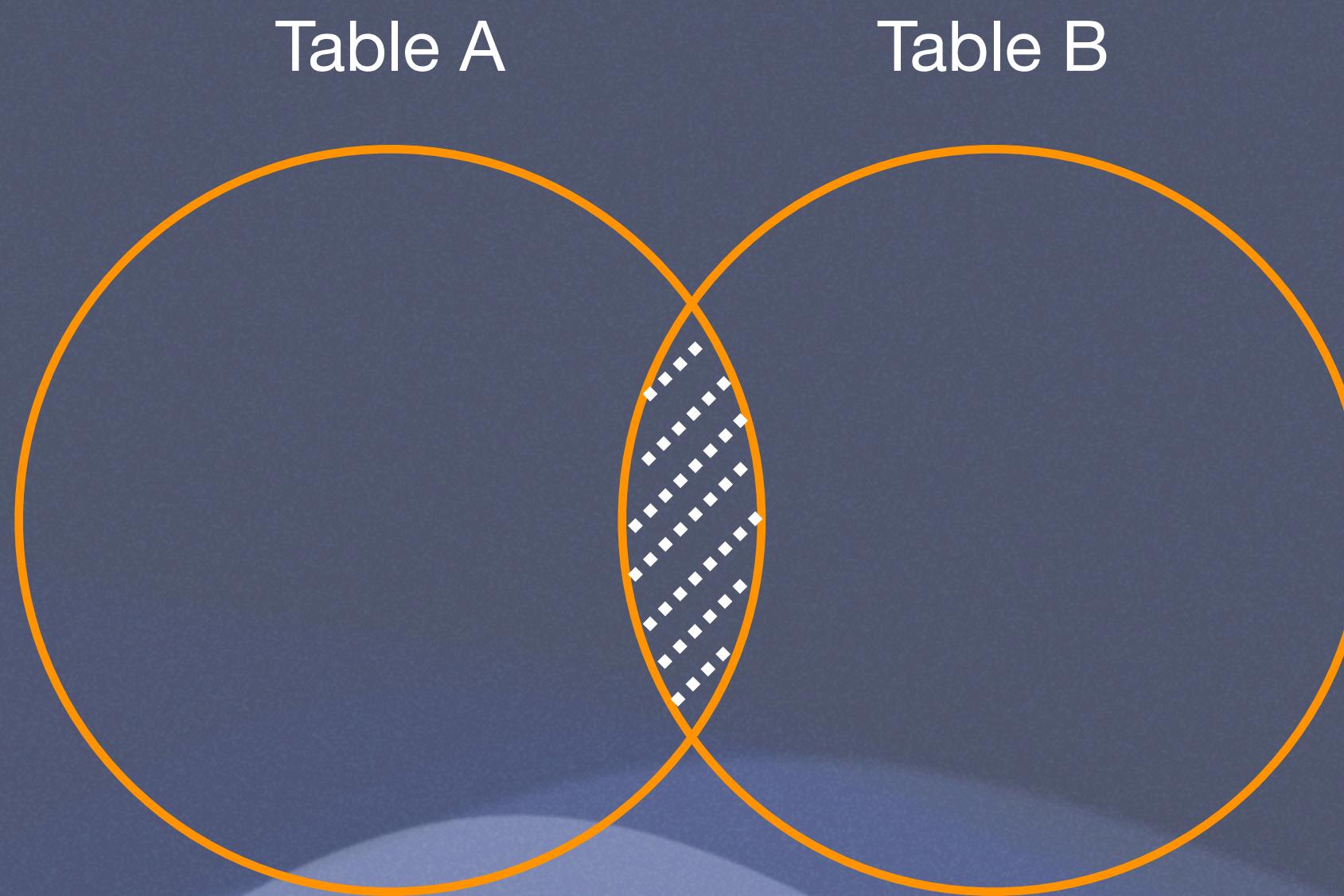
Joins are used to retrieve data from two or more data tables, based on a related column between them.

Different types of join:

- Inner join
- Full join
- Left join
- Right join
- Self Join

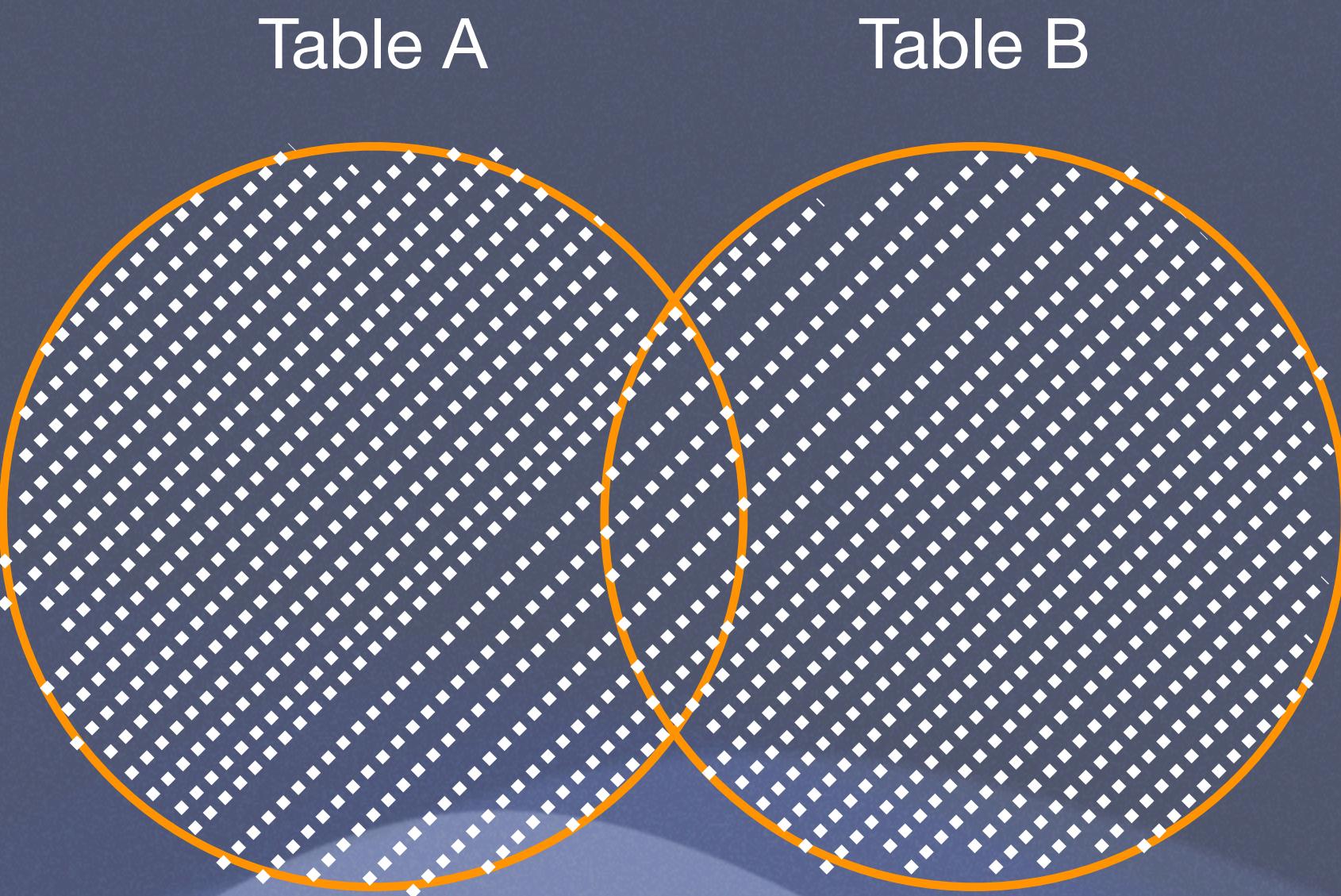
Inner Join

The INNER JOIN command selects records that have matching values in both tables.



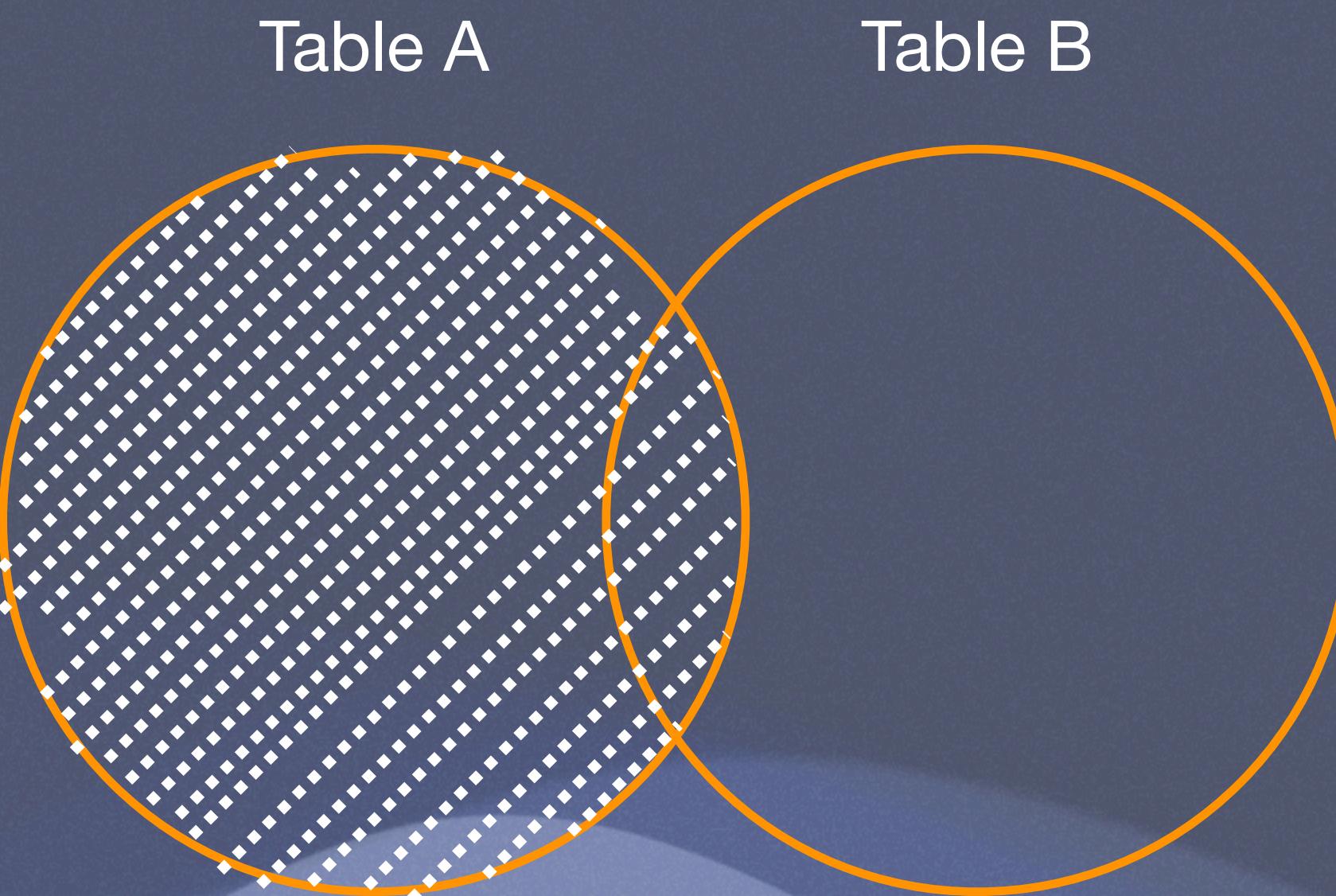
Full Join

The FULL OUTER JOIN keyword returns all records when there is a match in left or right table records.



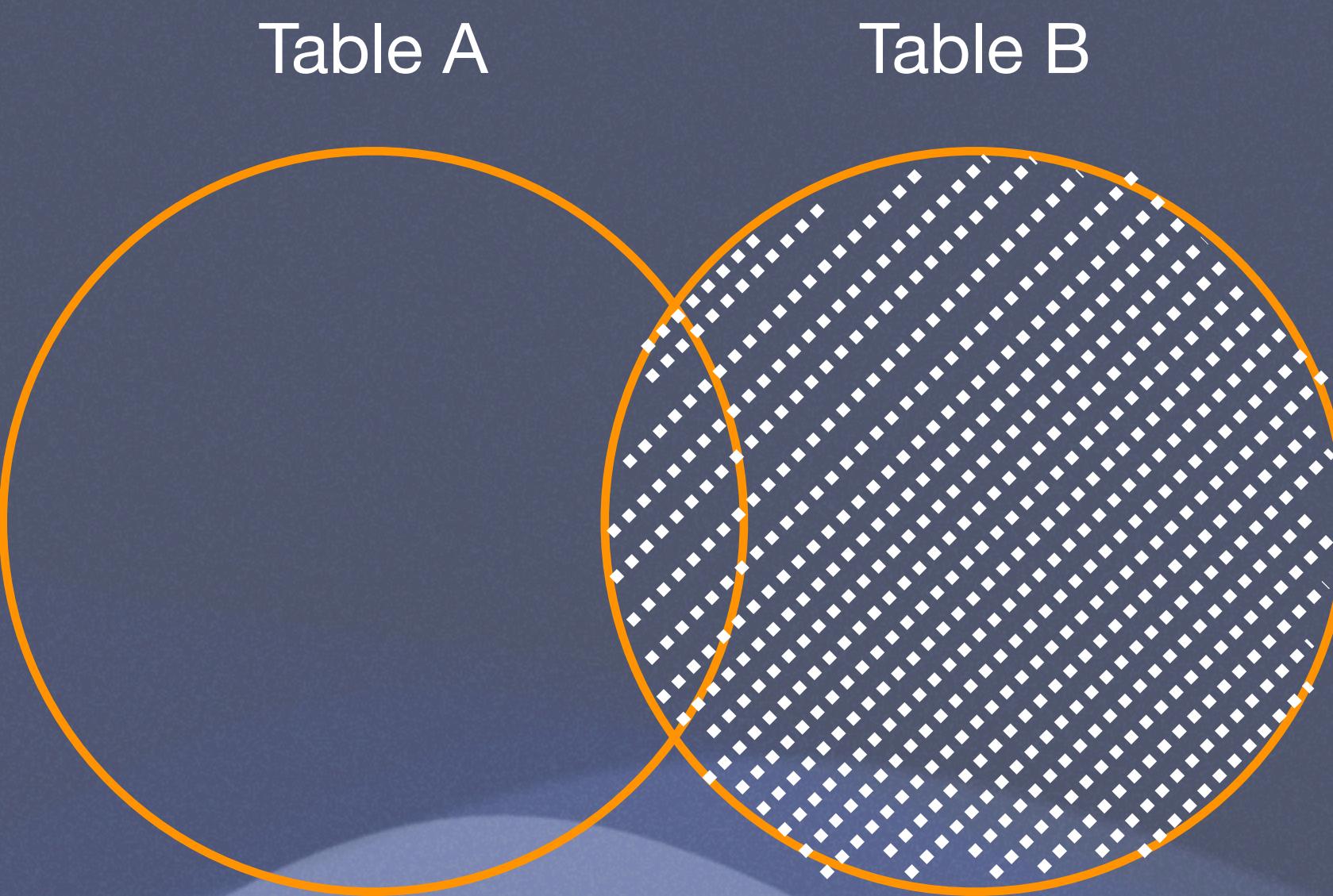
Left Join

The LEFT JOIN keyword returns all records from the left table, and the matching records from the right table. The result is 0 records from the right side, if there is no match.



Right Join

The RIGHT JOIN keyword returns all records from the right table, and the matching records from the left table. The result is 0 records from the left side, if there is no match.



Self Join

A self join is a regular join, but the table is joined with itself.

Example:

Find the users that are from the same country?

Null

A field with a **NUL** value has no value

Comparison operators cannot be used for Null values. What we should do in the queries for this values?

Two operators are available for it:

- IS NULL
- IS NOT NULL

More functions will be discussed in the coming sessions!

Order By

Used to sort the result-set from a **SELECT** statement in ascending or descending order.

Different types of sorting in MySQL:

- Descending
- Ascending

Note: The default mode for sorting is ascending.

Data Types

There are 3 main data types: string, numeric, data and time

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- string
- Numeric
- data and time

Note: The following data types are supported in MySQL version 8.0 and might be different in different versions.

String

- CHAR(size): Fixed length string (size could be from 0 to 255 - default=1)
- VARCHAR(size): Variable length string (size could be from 0 to 65535)
- BINARY(size): Equal to CHAR but stores binary byte strings.
- VARBINARY(size): Equal to VARCHAR but stores binary byte strings.
- TINYBLOB: For BLOBS (Binary Large OBjects). Max length: 255 bytes
- TINYTEXT: Holds a string with a maximum length of 255 characters
- TEXT(size): Holds a string with a maximum length of 65535 characters

String

- BLOB(size): For BLOBs (Binary Large OBjects). Holds up to 65535 bytes of data.
- MEDIUMTEXT: Holds a string with a maximum length of 16777215 characters.
- MEDIUMBLOB: For BLOBs (Binary Large OBjects). Holds up to 16777215 bytes of data.
- LONGTEXT: Holds a string with a maximum length of 4294967295 characters.
- LONGBLOB: For BLOBs (Binary Large OBjects). Holds up to 4294967,295 bytes of data.
- ENUM(val1, val2, val3, ...): A string object that can have only one value, chosen from a list of possible values. You can list up to 65535 values in an ENUM list.
- SET(val1, val2, val3, ...): A string object that can have 0 or more values, chosen from a list of possible values. You can list up to 64 values in a SET list.

Numeric

- BIT(size): A bit-value type. The number of bits per value is specified in size. The size parameter can hold a value from 1 to 64 (Default = 1).
- TINYINT(size): A very small integer. Signed range is from -128 to 127. Unsigned range is from 0 to 255.
- BOOL: 0=False, otherwise=True
- BOOLEAN: Equal to BOOL
- SMALLINT(size): A small integer. Signed range is from -32768 to 32767. Unsigned range is from 0 to 65535.
- MEDIUMINT(size): A medium integer. Signed range is from -8388608 to 8388607. Unsigned range is from 0 to 16777215
- INT(size): A medium integer. Signed range is from -2147483648 to 2147483647. Unsigned range is from 0 to 4294967295.
- INTEGER(size) Equal to INT(size)

Numeric

- **BIGINT(size):** A large integer. Signed range is from -9223372036854775808 to 9223372036854775807. Unsigned range is from 0 to 18446744073709551615.
- **FLOAT(size, d):** A floating point number. The total number of digits is specified in size. The number of digits after the decimal point is specified in the d parameter. Note: deprecated in Version 8.0.17
- **FLOAT(p):** A floating point number. MySQL uses the p value to determine whether to use FLOAT or DOUBLE for the resulting data type. If p is from 0 to 24, the data type becomes FLOAT(). If p is from 25 to 53, the data type becomes DOUBLE()
- **DOUBLE(size, d):** A normal-size floating point number. The total number of digits is specified in size. The number of digits after the decimal point is specified in the d parameter.
- **DOUBLE PRECISION(size, d)**
- **DECIMAL(size, d):** An exact fixed-point number. The total number of digits is specified in size (max value = 65, default=10). The number of digits after the decimal point is specified in the d parameter (max value=30, default =0)
- **DEC(size, d):** Equal to DECIMAL(size,d)

Date and Time

- DATE: A date. Format: YYYY-MM-DD.
- DATETIME(fsp): A date and time combination. Format: YYYY-MM-DD hh:mm:ss.
- TIMESTAMP(fsp): A timestamp. TIMESTAMP values are stored as the number of seconds since the Unix epoch ('1970-01-01 00:00:00' UTC). Format: YYYY-MM-DD hh:mm:ss.
- TIME(fsp): A time. Format: hh:mm:ss.
- YEAR: A year in four-digit format. Values allowed in four-digit format: 1901 to 2155, and 0000.

Any Question?

See you in the next week :)