BOOTCAMP ’20

SESSION #27

Session 26

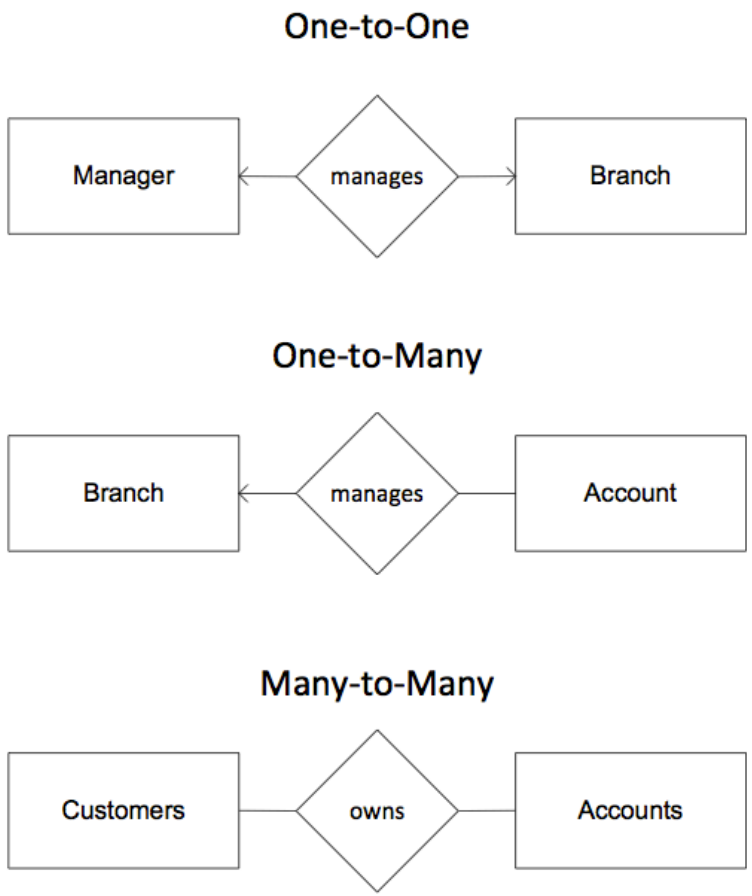
- MySQL and Databases
- Installing and Testing MySQL
- How Shall We Store it? — Datatypes
- Designing and Creating Tables
- Populating the Database
- Retrieving the Data
- Changing Data
- Deleting Data
- Aggregate Functions
- Working with Dates and Times

What will be covered?

- Relationships
- Indexes
- Joins
- Stored procedures
- Stored functions

Relationships

- One-to-One
- One-to-Many
- Many-to-Many



Relationships

- A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
- It acts as a cross-reference between tables because it references the primary key of another table, thereby establishing a link between them.
- Syntax:

```
CREATE TABLE IF NOT EXISTS table_name (
        ...
        FOREIGN KEY column_name REFERENCES table_name (column_name);
);

ALTER TABLE table_name ADD FOREIGN KEY column_name REFERENCES table_name
(column_name);

ALTER TABLE table_name DROP FOREIGN KEY column_name;
```

Relationships

- Possible ON DELETE and ON UPDATE are:
  - RESTRICT
  - CASCADE
  - SET NULL
  - NO ACTION (same as RESTRICT)
- Syntax:

FOREIGN KEY column_name **REFERENCES** table_name (column_name) **ON UPDATE** [RESTRICT| CASCADE|SET NULL|NO ACTION];

CONSTRAINT fk_name **FOREIGN KEY** column_name **REFERENCES** table_name (column_name) **ON UPDATE** [RESTRICT| CASCADE|SET NULL|NO ACTION];

Indexes

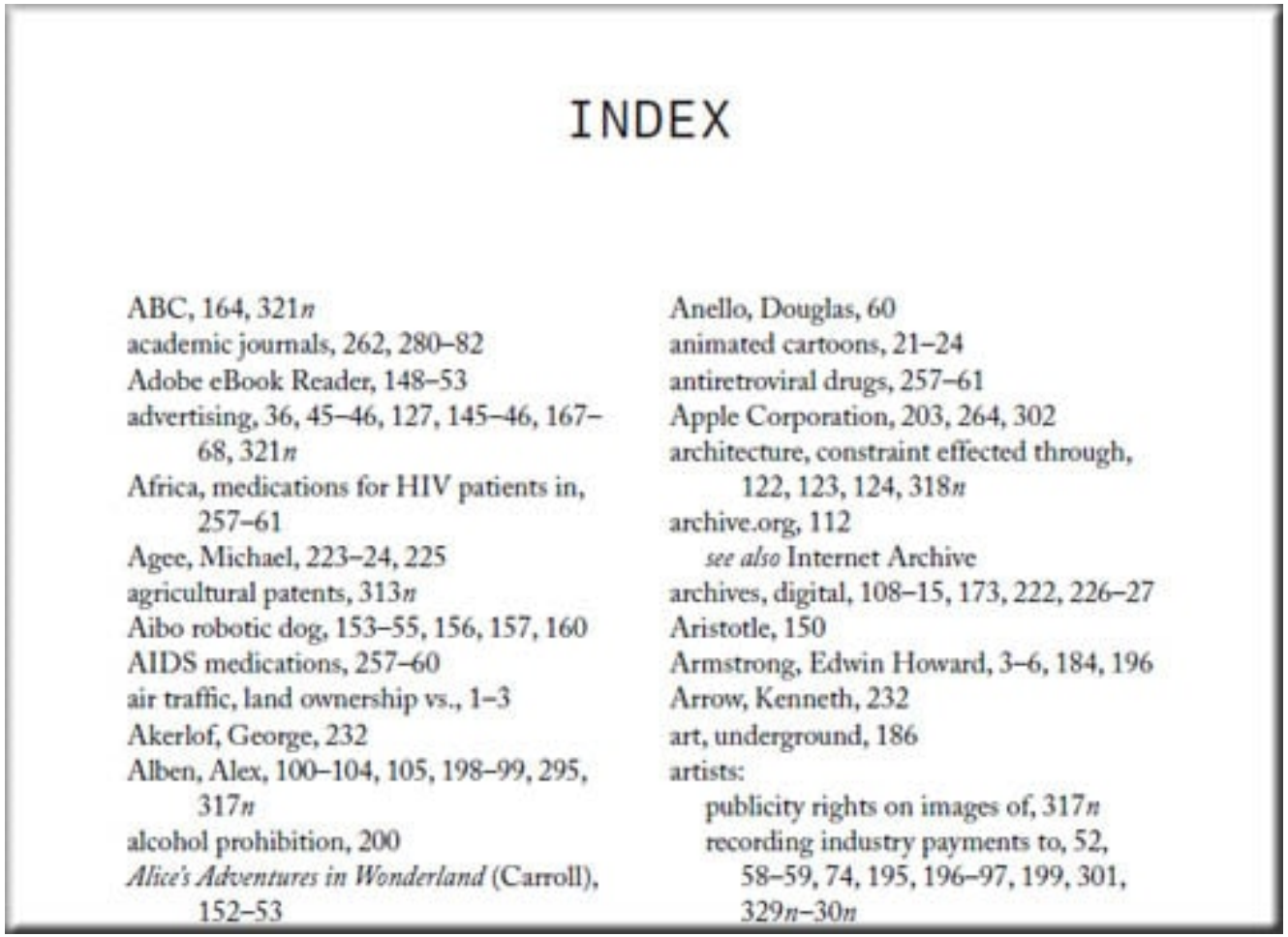
- A database index is a data structure that improves the speed of operations in a table. Indexes can be created using one or more columns, providing the basis for both rapid random lookups and efficient ordering of access to records.

- Syntax:

```
CREATE TABLE IF NOT EXISTS table_name (
        ...
        INDEX index_name (column_name);
        INDEX index_name (column_name_1, ..., column_name_N);
);

ALTER TABLE table_name ADD INDEX index_name (column_name);
ALTER TABLE table_name ADD INDEX index_name (column_name_1, ..., column_name_N);

CREATE INDEX index_name ON table_name (column_name);
CREATE INDEX index_name ON table_name (column_name_1, ..., column_name_N);

DROP INDEX index_name ON table_name;
```

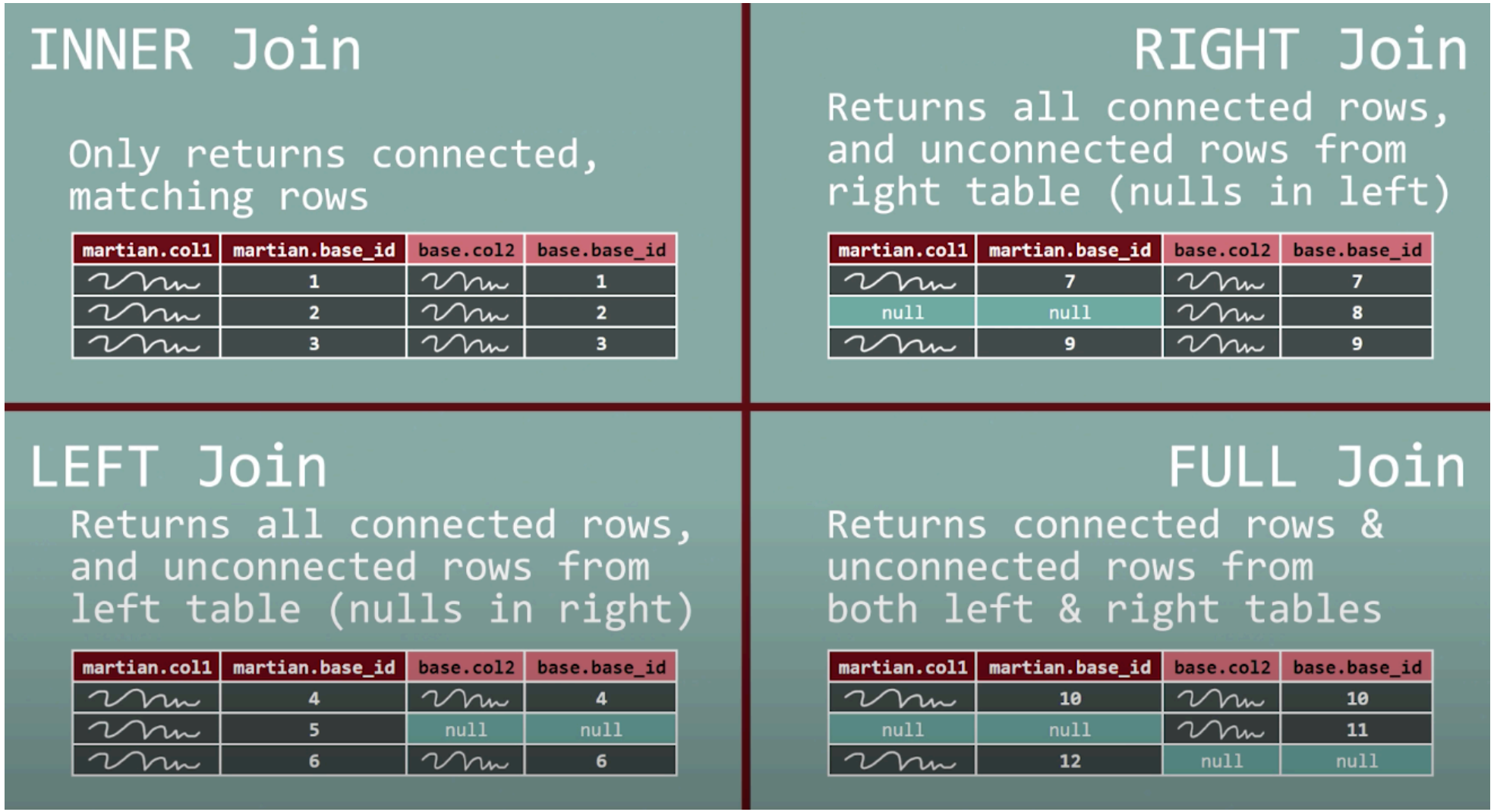
Indexes

What's this?

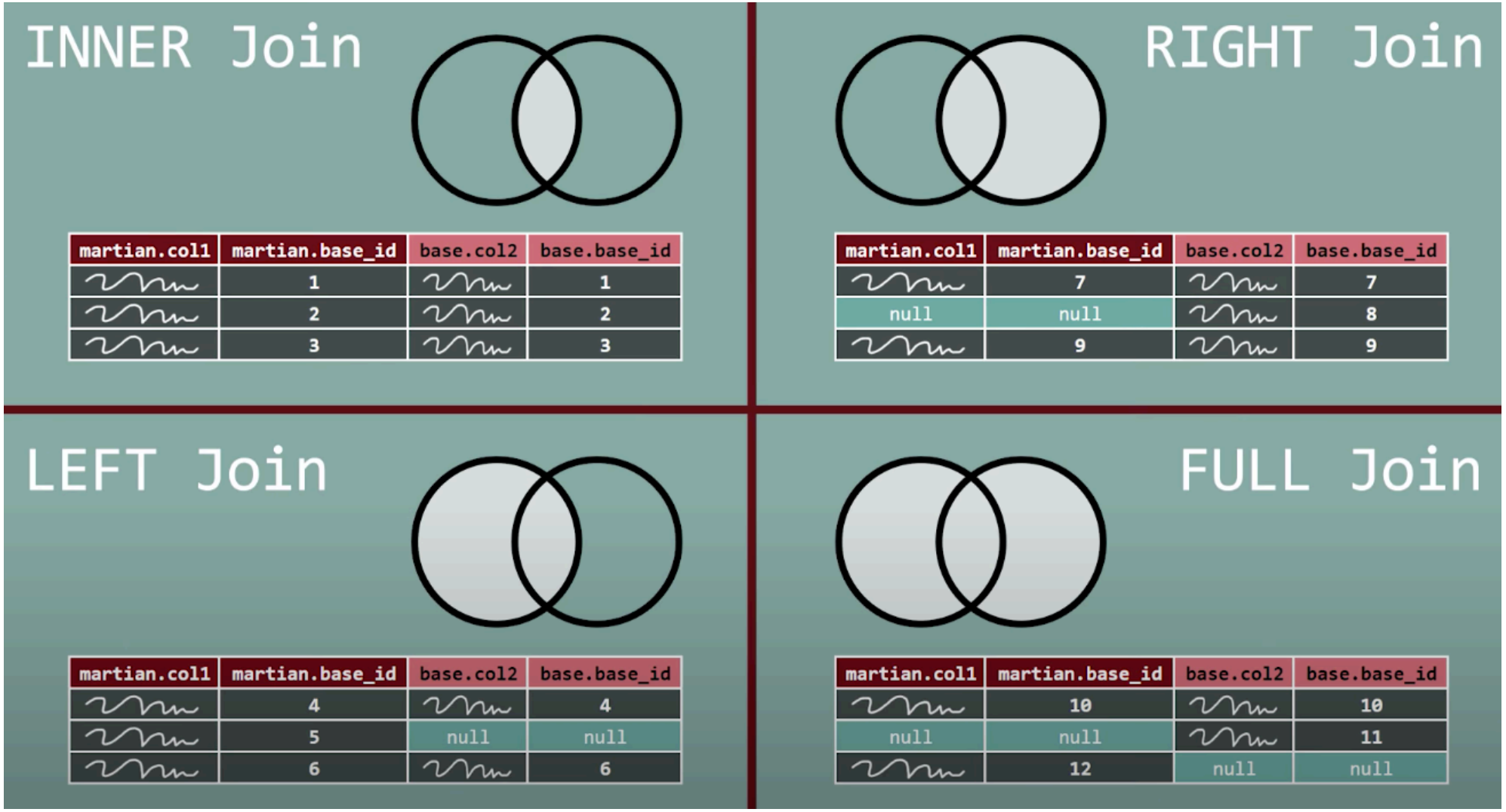


INDEX

Joins


INNER Join
Only returns connected, matching rows
martian.col1 | martian.base_id | base.col2 | base.base_id
1 | 1
2 | 2
3 | 3
RIGHT Join
Returns all connected rows, and unconnected rows from right table (nulls in left)
martian.col1 | martian.base_id | base.col2 | base.base_id
7 | 7
null | null | 8
9 | 9
LEFT Join
Returns all connected rows, and unconnected rows from left table (nulls in right)
martian.col1 | martian.base_id | base.col2 | base.base_id
4 | 4
5 | null | null
6 | 6
FULL Join
Returns connected rows & unconnected rows from both left & right tables
martian.col1 | martian.base_id | base.col2 | base.base_id
10 | 10
null | null | 11
12 | null | null

Joins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FULL Join
martian.col1 | martian.base_id | base.col2 | base.base_id
10 | 10
null | null | 11
12 | null | null

Stored procedures

- A procedure (often called a stored procedure) is a subroutine like a subprogram in a regular computing language, stored in database.
- A procedure has a name, a parameter list, and SQL statement(s).
- Almost all relational database system supports stored procedure, MySQL 5 introduce stored procedure.

Stored procedures

Here is the basic syntax of the `CREATE PROCEDURE` statement:

```
CREATE PROCEDURE procedure_name(parameter_list)
BEGIN
   statements;
END //
```

```
1    DELIMITER //
2
3 ●  CREATE PROCEDURE GetAllProducts()
4    BEGIN
5        SELECT *  FROM products;
6    END //
7
8    DELIMITER ;
```

To execute a stored procedure, you use the `CALL` statement:

```
CALL stored_procedure_name(argument_list);
```

```
CALL GetAllProducts();
```

Read more: https://www.w3resource.com/mysql/mysql-procedure.php

Stored functions

- A stored function is a set of SQL statements that perform some operation and **return** a single **value**.
- Just like Mysql in-built function, it can be called from within a Mysql statement.
- By default, the stored function is associated with the default **database**.

```
CREATE FUNCTION `title_and_year`(title CHAR(200), year INT)
RETURNS char(205) DETERMINISTIC
BEGIN
    RETURN CONCAT(title, ' ', year);
END
```

QUESTIONS