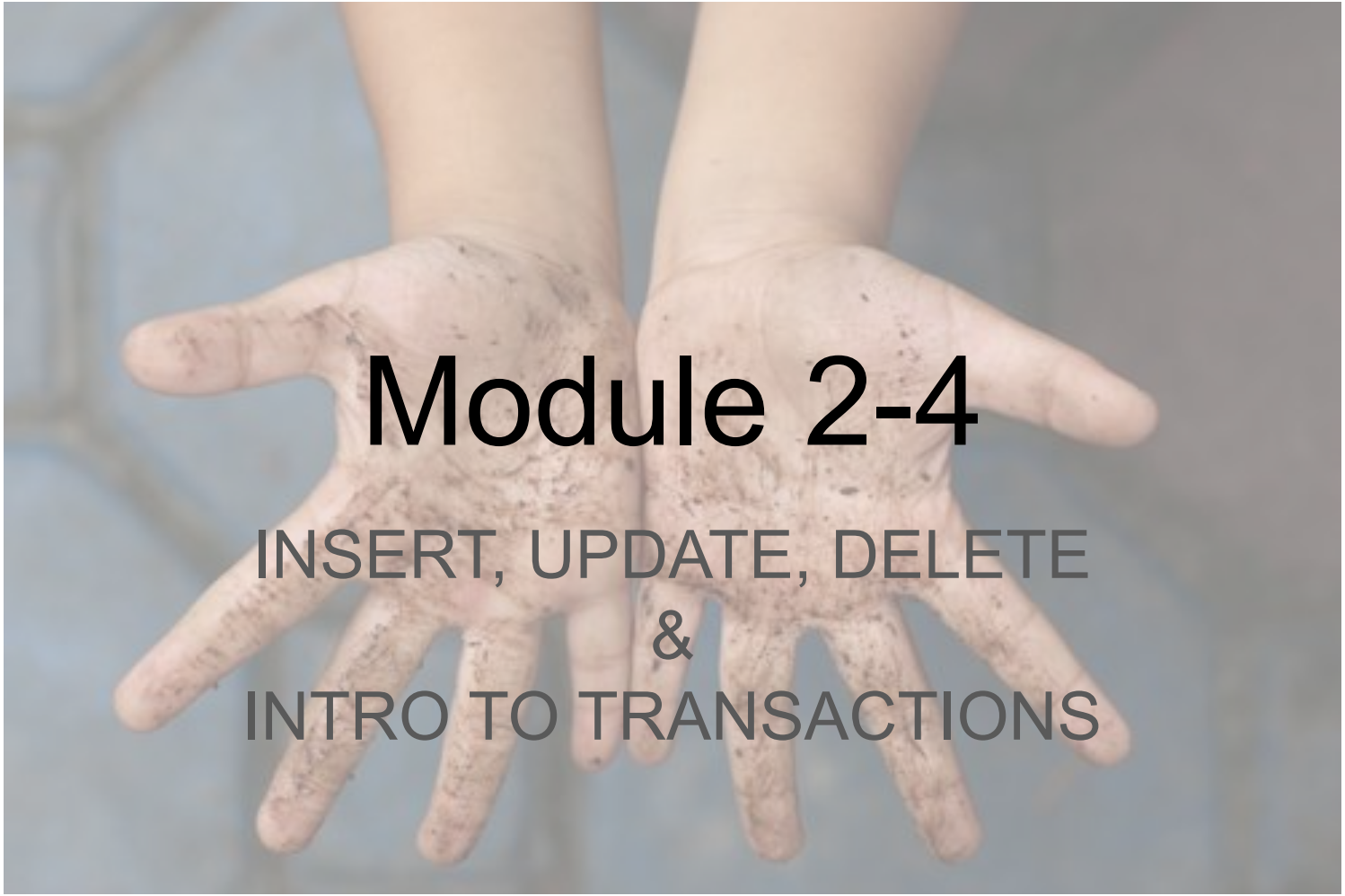
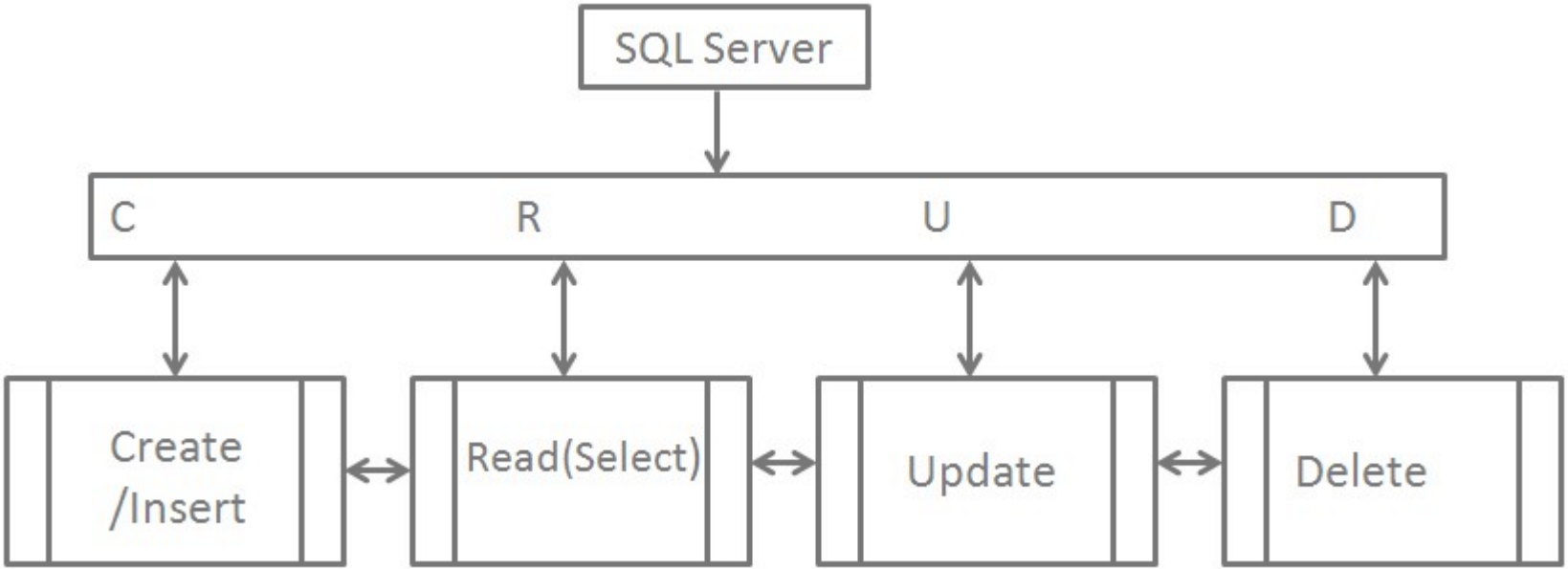


Module 2-4

INSERT, UPDATE, DELETE
&
INTRO TO TRANSACTIONS

SQL Operations: CRUD



https://www.sqlshack.com/crud-operations-in-sql-server/

Changing data

The row data for each table in a database can be changed or deleted. New rows of data can also be added. There are 3 types of statements we will cover today:

- **INSERT**: Adds a new row to the table.
- **UPDATE**: Changes the column value for an existing row or rows.
- **DELETE**: Permanently removes a row from the table.

INSERT statements

You can use the INSERT statement to insert a row into the database.
The syntax of INSERT is as follows:

INSERT INTO **[Name of Table]** (**[name of col 1]**, **[name of col 2]**)

VALUES (**[value for col 1]**, **[value for col2]**);

INSERT statements example

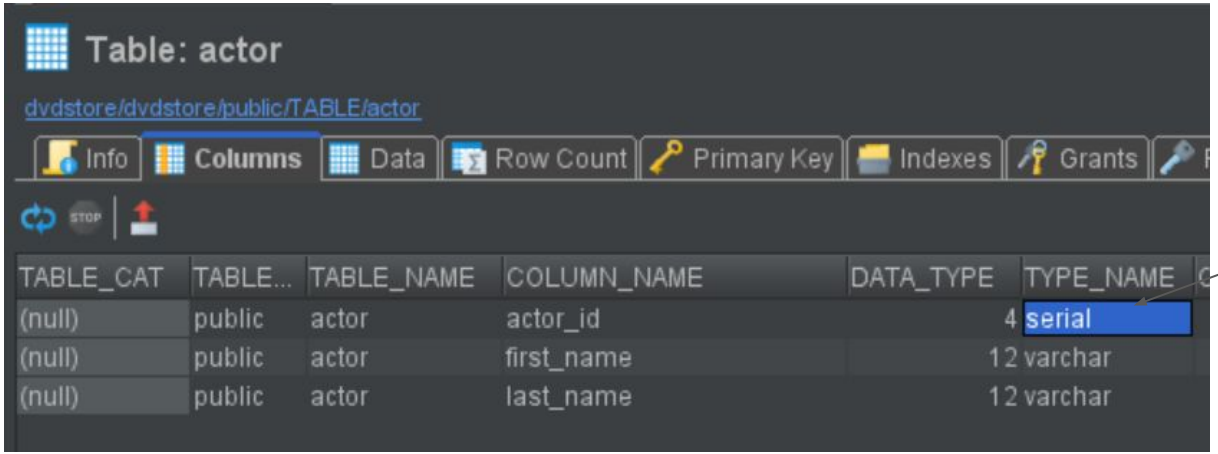
Consider the following example:

```
INSERT INTO actor (first_name, last_name) VALUES ('Shia','LeBouf');
```

This translates to “*insert a new row in the table actor, in this new row the value for first_name is going to be ‘Shia’ and the value for the last_name is going to be ‘LeBouf’*.

INSERT Statement Part II: What about the ID?

Note that in the previous example, we only specified two out of three columns and did not specify that a value be inserted for actor_id.



- actor_id is of a special data type called **serial**.
- A column marked as serial will automatically increase in value with each new row.
- Columns marked as serial should not be included in the INSERT.

UPDATE statements

An update statement changes the values in specified columns.

1) **It will execute against against the ALL rows in the table.**
2) **Updates are only limited by JOINs(more later) and WHERE clause filters!**

UPDATE [table name]

SET [col 1 name] = <literal value, expression, or scalar sub-select>

WHERE ...

UPDATE: A Basic Example

Consider the following example:

```
UPDATE actor
SET
first_name = 'Nicholas',
last_name = 'Wahberg'
WHERE
actor_id = 2;
```

In the SET clause, we are changing the value for 2 columns (first_name and last_name)

We can separate multiple columns that need updating with a comma.

The syntax for structuring the WHERE statement remains unchanged. Here it is limiting the UPDATE to only the rows with an actor_id of 2.

DELETE statements

A delete statement removes **a row or rows** from the table. It follows this format:

DELETE FROM [table name]

WHERE …

Just as in the UPDATE statement, **the absence of a WHERE statement will affect every row in the database**; they will all be deleted!

DELETE statements example

In the following SQL Statement we are deleting **every row** that has an actor_id of 2.

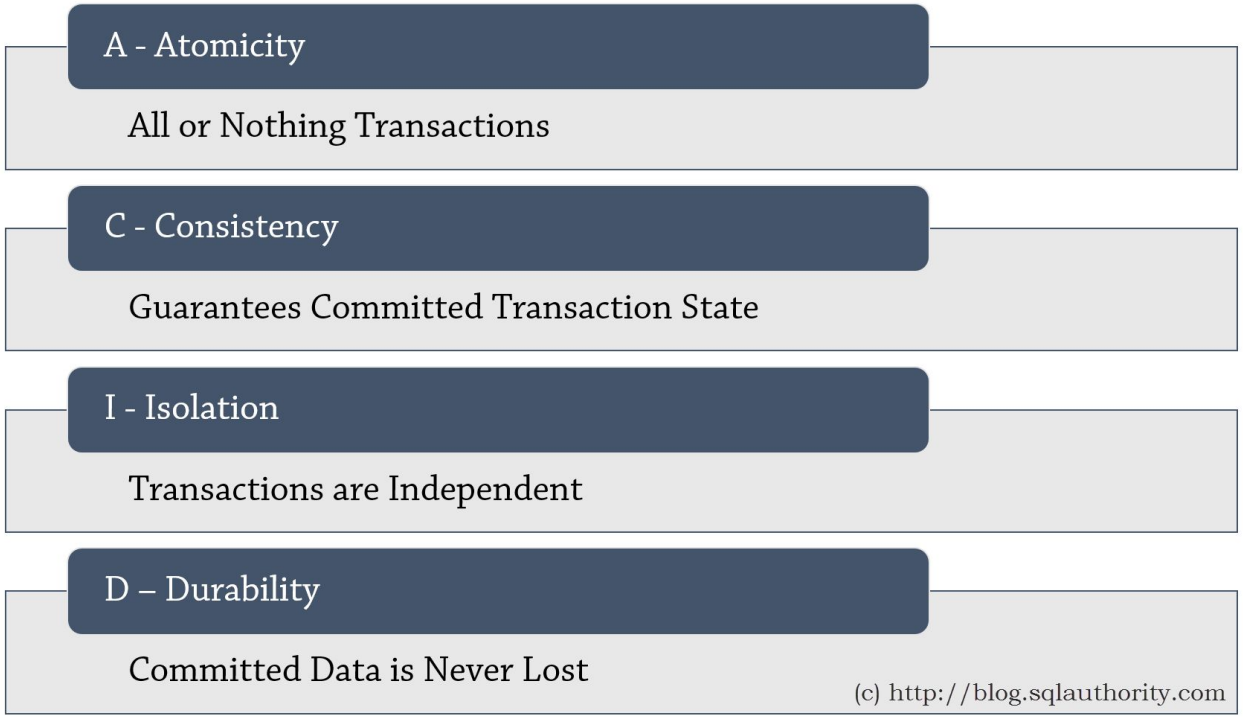
```
DELETE FROM film_actor
WHERE
actor_id = 2;
```

Constraints

Constraints are rules imposed on the table, upon creation, that limits the ability to change the data.

- **NOT NULL:** A value must be specified
- **PRIMARY KEY:** Define that certain column/columns are part of the key
  - **A primary key value cannot be NULL**.
- **FOREIGN KEY:** Defines a foreign key based on a primary key from a different table
- **CHECK:** Only certain values can be inserted or updated

What Constitutes a Transaction: The ACID Test



Transactions

A large number of SQL statements can be rolled into a single transaction.

The following syntax is observed:

BEGIN TRANSACTION;

// Lots of SQL statements.

COMMIT TRANSACTION;

Your INSERT or UPDATE SQL statements **will only commit (permanently save in the database) if all the SQL statements in the transaction end successfully**.