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Referential Integrity

Relational Databases Basics

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Read and remember!

Referential Integrity – the rule that no referencing tuple is allowed to exist if the corresponding referenced tuple doesn't also exist.

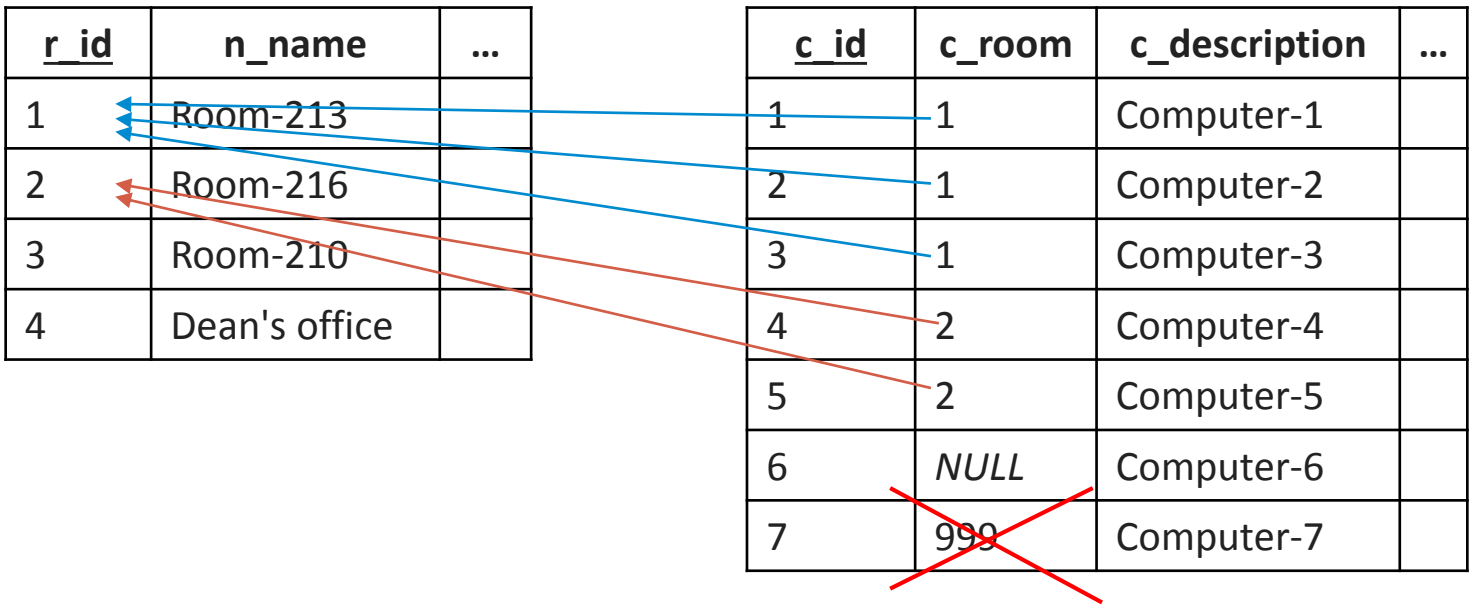
Referential Integrity

room

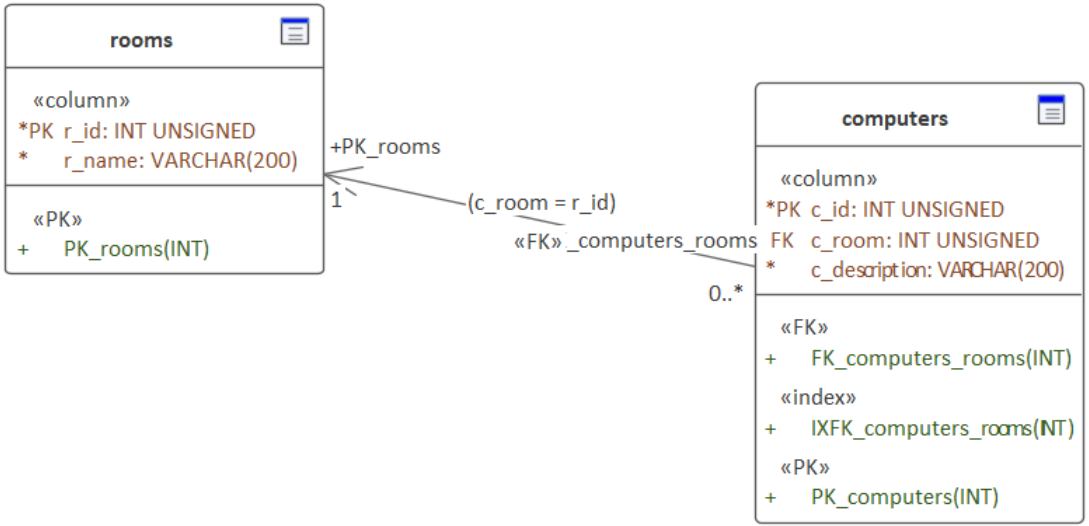
r_id	n_name	…
1	Room-213	
2	Room-216	
3	Room-210	
4	Dean's office	

computer

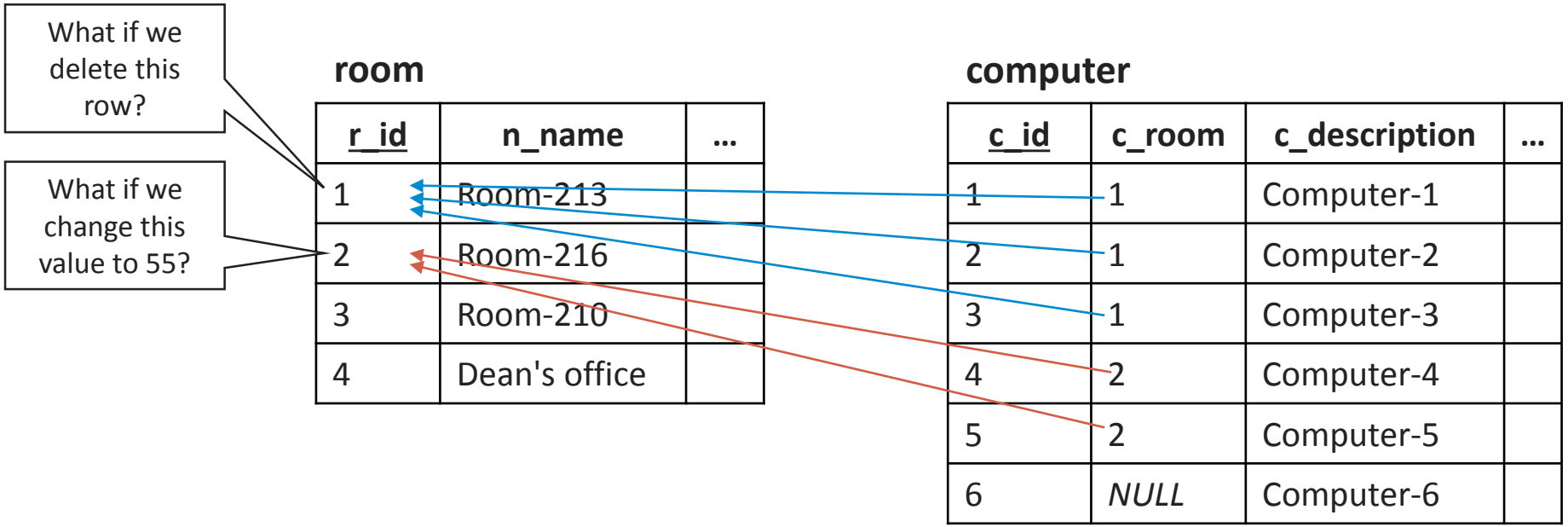
c_id	c_room	c_description	…
1	1	Computer-1	
2	1	Computer-2	
3	1	Computer-3	
4	2	Computer-4	
5	2	Computer-5	
6	*NULL*	Computer-6	
7	999	Computer-7	



Let’s look at a quick demo…



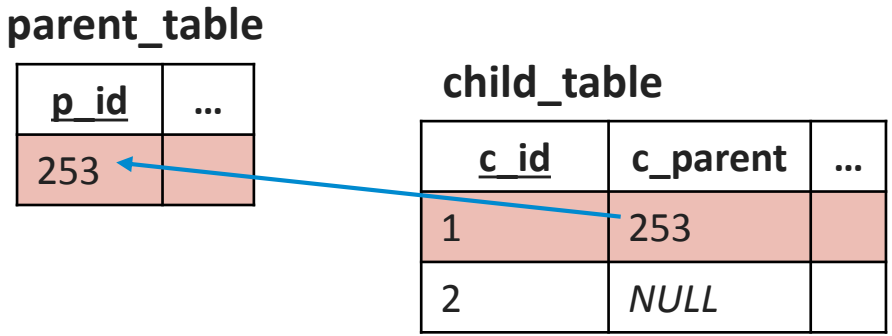
Cascade operations



Cascade operations: “ON DELETE CASCADE”

When you delete a record from the parent table, all corresponding records from the child table are also deleted.

E.g.: a news-site with a rule “if you delete a news rubric, all corresponding news should be deleted to”.

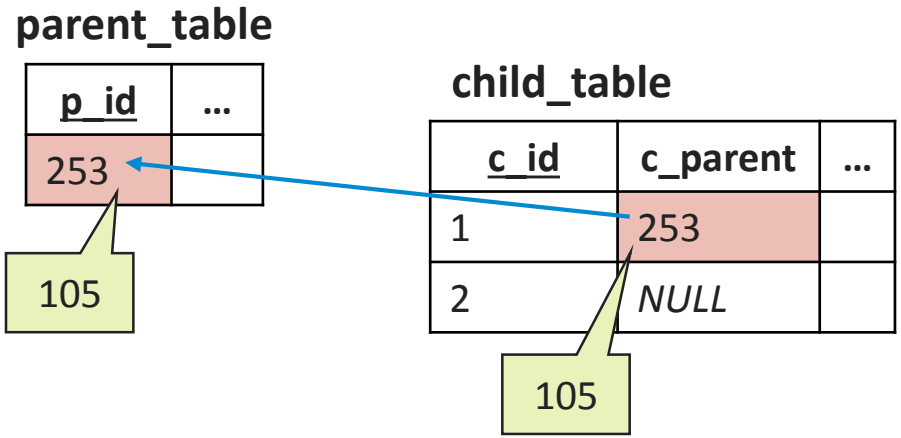


Supported by all DBMSes.

Cascade operations: “ON UPDATE CASCADE”

When you update a PK value in a record in the parent table, all corresponding FK values of all records in the child table are also updated.

E.g.: employees and payments are connected through employee’s passport id, if that id changes, all corresponding payments should be updated.



Supported by most DBMSes.

Cascade operations: “ON DELETE SET NULL”

When you delete a record from the parent table, FK values of all corresponding records from the child table are set to NULL.

E.g.: with termination of the lease agreement (deletion of information about the tenant), a room becomes vacant (tenant is not specified, i.e. NULL).

parent_table

p_id	…
253	

child_table

c_id	c_parent	…
1	253	
2	*NULL*	

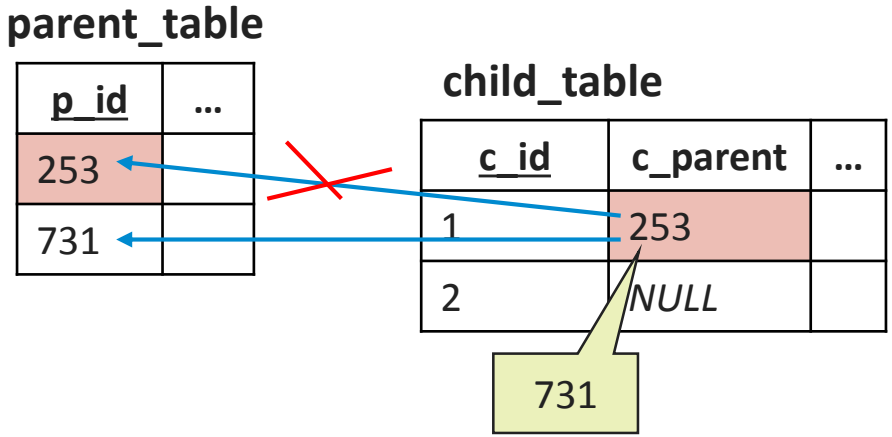
NULL

Supported by most DBMSes.

Cascade operations: “ON DELETE SET DEFAULT VALUE”

When you delete a record from the parent table, FK values of all corresponding records from the child table are changed to some default value.

E.g.: in case of dismissal of a call center employee, all phone numbers previously assigned to this employee are transferred to the department head.

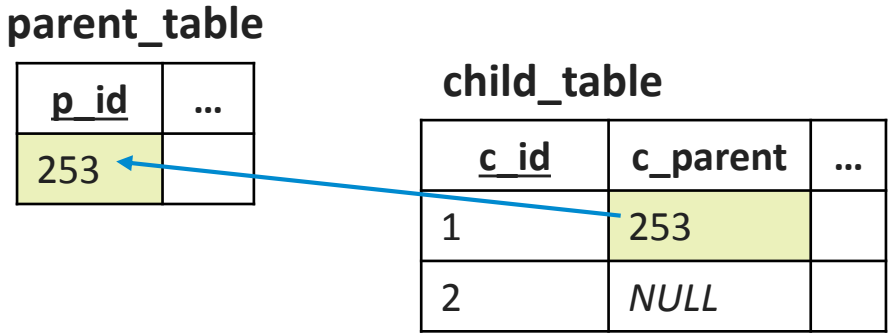


Not supported by any DBMSes. You should implement this behavior yourself (using triggers).

Cascade operations: “ON DELETE NO ACTION”, “ON UPDATE NO ACTION”

When you delete a record from the parent table, or update a PK value of a record of a parent table, the operation is prohibited if there is any corresponding record in the child table.

E.g.: in some online store, one cannot delete a product category if at least one product is assigned to it.



“ON DELETE NO ACTION” == “ON DELETE RESTRICT”
“ON UPDATE NO ACTION” == “ON UPDATE RESTRICT”

Supported by all DBMSes.

Cascade operations: important facts

Cascade operations are activated by modifying **PARENT** table only.

Cascade operations are activated if only **PRIMARY KEY** is affected.

Data insertion and selection never activate any cascade operations.

Some type of cascade operations are to be implemented “manually” (via triggers) in some DBMSes.

Most cascade operations are mutually exclusive (e.g., you can not activate “on delete cascade” and “on delete set null” at the same time).

Read and remember!

Data consistency – a database property stating that a database should conform to all declared integrity constraints.

Data consistency

news_rubric

nr_id	nr_name	nr_total	nr_last
1	IT	34534	2017-01-01 12:34:01
2	Science	54231	2017-01-11 18:21:34
…	…	…	…
298	Sport	34632	2016-12-31 16:01:18

news

n_id	n_rubric	n_datetime	…
1	1	2016-11-17 15:12:09	
2	1	2017-01-01 12:34:01	
3	2	2017-01-11 18:21:34	
4	2	2015-12-19 08:12:37	
…	…	…	
542837	298	2016-12-31 16:01:18	

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