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Q1. what is BCNF in Normalization?

A. Why do you need all of this normalization stuff? The main goal is to avoid redundancy in your data. Redundancy can lead to [various anomalies when you modify your data](https://www.vertabelo.com/blog/update-anomalies). Every fact should be stored only once and you should know where to look for each fact. The normalization process brings order to your filing cabinet. You decide to conform to certain rules where each fact is stored.

## Boyce-Codd Normal Form (BCNF)

* When a relation has more than one candidate key, anomalies may result even though the relation is in 3NF.
* 3NF does not deal satisfactorily with the case of a relation with overlapping candidate keys
* i.e. composite candidate keys with at least one attribute in common.
* BCNF is based on the concept of a determinant.
* A determinant is any attribute (simple or composite) on which some other attribute is fully functionally dependent.
* A relation is in BCNF is, and only if, every determinant is a candidate key.

Consider the following relation and determinants.

R(a,b,c,d)  
 a,c -> b,d  
 a,d -> b

Here, the first determinant suggests that the primary key of R could be changed from a,b to a,c. If this change was done all of the non-key attributes present in R could still be determined, and therefore this change is legal. However, the second determinant indicates that a,d determines b, but a,d could not be the key of R as a,d does not determine all of the non key attributes of R (it does not determine c). We would say that the first determinate is a candidate key, but the second determinant is not a candidate key, and thus this relation is not in BCNF (but is in 3rd normal form).