



# **Database Management System**

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# Outline

- Relational Decomposition

- Properties of Decomposition



# Relational Decomposition

- Decomposition is the process of breaking down in parts or elements.
- It replaces a relation with a collection of smaller relations.
- It breaks the table into multiple tables in a database.
- It should always be lossless, because it confirms that the information in the original relation can be accurately reconstructed based on the decomposed relations.
- If there is no proper decomposition of the relation, then it may lead to problems like loss of information.

# Properties of Decomposition

1. Dependency Preservation
2. Lossless Join Decomposition
3. Lack of Data Redundancy



# Dependency Preservation

- Dependency is an important constraint on the database.
- Every dependency must be satisfied by at least one decomposed table.
- If  $\{A \rightarrow B\}$  holds, then two sets are functional dependent. And, it becomes more useful for checking the dependency easily if both sets in a same relation.
- This decomposition property can only be done by maintaining the functional dependency.
- In this property, it allows to check the updates without computing the natural join of the database structure.
- Problem Solving on **Dependency Preservation**

# Lossless Join Decomposition

- Decomposition must be lossless. It means that the information should not get lost from the relation that is decomposed.
- It gives a guarantee that the join will result in the same relation as it was decomposed.
- Problem Solving on **Lossless Join Decomposition**.



# Lack of Data Redundancy

- o Lack of Data Redundancy is also known as a Repetition of Information.
- o The proper decomposition should not suffer from any data redundancy.
- o The careless decomposition may cause a problem with the data.
- o The lack of data redundancy property may be achieved by Normalization process.



End of Lecture