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

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