

**Questions:****1. What is the purpose of the SELECT operation in a relational database?**

*Answer:* The SELECT operation in a relational database is utilized to retrieve specific tuples from a relation based on certain criteria. For instance, using the syntax `NEW <- SELECT from EMPLOYEE where EmplId = '34Y70'` creates a new relation called NEW, containing tuples from the EMPLOYEE relation where the EmplId attribute equals '34Y70'. This operation allows the extraction of information about a particular employee.

**2. How does the PROJECT operation differ from the SELECT operation in a relational database?**

*Answer:* Unlike the SELECT operation that extracts rows, the PROJECT operation in a relational database is used to extract columns. For example, the syntax `NEW2 <- PROJECT JobTitle from NEW1` creates a new relation (NEW2) containing the JobTitle column from the relation NEW1. The PROJECT operation focuses on extracting specific columns rather than rows.

**3. Explain the purpose and mechanics of the JOIN operation in a relational database.**

*Answer:* The JOIN operation is employed to combine different relations into a new relation. It produces a relation with attributes from the original relations, and these attributes are uniquely named to avoid conflicts. The tuples of the new relation are formed by concatenating tuples from the original relations based on a specified condition. For instance, `C <- JOIN A and B where A.W = B.X` combines tuples from relations A and B where the values of attributes W and X are equal.

**4. How can the JOIN operation be applied to retrieve information from multiple relations in a database?**

*Answer:* To retrieve information distributed over multiple relations, the JOIN operation is employed. For example, `NEW1 <- JOIN ASSIGNMENT and JOB where ASSIGNMENT.JobId = JOB.JobId` combines ASSIGNMENT and JOB

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relations based on the JobId attribute. Subsequently, the desired information can be obtained by further operations like SELECT and PROJECT. In the given scenario, the sequence involves selecting tuples with a specific condition (**ASSIGNMENT.TermDate = '\*'**) and then projecting specific attributes (**ASSIGNMENT.EmplId, JOB.Dept**). This sequence efficiently extracts relevant information from the database.

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