Task-8:

Date:- 30/9/25

Normalizing Databases using Functional dependencies upto BCNF

Step-1:- Define the initial relational schema and functional dependencies.

Student Slot (Student_ID, Student_Name, Email, Dept_ID, Dept_Name, Course_ID, Course_Name, Credits, Slot_ID, Slot_Type, Date, Venue).

1. Student_ID → Student_Name, Email, Dept_ID
2. Dept_ID → Dept_Name.
3. Course_ID → Course_Name, Credits, Course_Type
4. Slot_ID → Slot_Type, Date, Venue.
5. Student_ID, Slot_ID → Course_ID.

Step-2:- Connect the relation to 1NF.

* Identify and elimate any repeating groups or arrays in the student slot relation.
* Create separate tables if repeating groups exist.

Step 3:- Connect to 2NF

* Ensure that each non-key attribute depends on the whole primary key.
* Move non-key Attributes to separates relations if they depends on only part of the primary key.

proposed Decomposition

1. Student (Student_ID, Student_Name, Email, Dept_ID)
2. Department (Dept_ID, Dept_Name)
3. Course (course_ID, course_Name, Credits)
4. Slot (Slot_ID, Slot_Type, Date, Venue)
5. Student - Slot_Course (student_ID, Slot_ID, Course_ID).

Step-4:- Connect to 3NF

* Remove transitive dependencies where a non-key attribute depends on another non-key attribute.

→ There is no transitive dependencies.

Step-5:- Connect to BCNF

* Ensure every determinant is a candidate key.
* check for overlapping candidate keys
* Decompose relations to eliminate redundancy.

→ No decomposition needed.

Use Griffith Tool.

1. Input relational schema and functional dependencies.
2. Griffith tool generates a dependency graph.
3. Analyze the graph to identify normalization issues.
4. Apply normalization rules to transform the schema
5. Verify the resulting schema meets BCNF criteria.

Griffith tool steps.

1. Create a new project in Griffith.
2. Define the relational schema and FDs.
3. Run the "Dependency Graph" tool.
4. Analyze the graph for normalization issues.
5. Apply transformations using the "normalize" tool.
6. Verify BCNF compliance using the "BCNF" check tool.

Normalized Schema

1. Student (Std_Id, student_Name, Email)
2. Department (Dept_ID, Dept_Name)
3. Course (course_ID, Course_Name, Credits)
4. Slot (slot_ID, Slot_Type, Date, venue)
5. student_slot_course (student_ID, Slot_ID, Course_ID).

VEL. TECH CSE	
EX NO	9
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	4
RECORD (5)	4
TOTAL (20)	18
SIGN WITH DATE	

17/10

VELTECH	
EX No.	
PERFORMANCE (5)	
RESULT AND ANALYSIS (5	
VIVA VOCE (5	
RECORD (5	
TOTAL 20	
SIGN WITH DATE	

Result:-

Thus, the implementation of Normalizing Databases using functional dependencies upto BCNF is successfully executed.