29/9/25 Task : 2

Normalizing database 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. Students_ID → Students_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 INF.

* Identify and eliminate any repeating group or array in the Studentslot relation
* Create seperate table if repeating group exist.

Step(3) :-

Connect to 2NF

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

proposed and

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) students_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 transistive dependencies

Step 5:- Connect of BCNF

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

→ NO decomposition needed.

Use G Shift tool:-

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

Grittith tool steps:-

① Create a new project in Grittith.
② Define the relational schema and FDs
③ Run the "Dependency graph" tool.
④ Analyze transformation using the "normalize" tool
⑤ Verify BCNF compliance using the "BCNF check" tool.

Normalized Schema:-

① Student (Student_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	8
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	4
RECORD (5)	
TOTAL (20)	18
SIGN WITH DATE	10/10

VEL TECH	
EX No.	
PERFORMANCE (5)	
RESULT AND ANALYSIS (3)	
VIVA VOCE (3)	
RECORD (4)	
TOTAL (15)	
SIGN WITH DATE	

Result:-

Thus, the implementation of Normalization database using functional dependency upto BCNF.