Date: November 1, 2023

Group 4 Topic # 26 Payroll Management DBMS		
Names	Student #	Signature
Hamza Malik	501112545	Malik
Omer Zulfiqar	501101201	omerz
Amanat Sodhi	501108395	AS

Assignment 6 Goal:

To show Functional dependencies in a report.

BCNF DESIGNATION TABLE:

- It has only two attributes, DESIGNATION_ID and TITLE.
- DESIGNATION_ID is the primary key and determines TITLE.
- There are no non-prime attributes (all attributes are part of a candidate key).

BCNF EMPLOYEE TABLE:

- EMPLOYEE_ID is the primary key, and it determines NAME and DESIGNATION_ID.
- There is a foreign key DESIGNATION_ID that refers to the DESIGNATION table, ensuring referential integrity.
- No attribute is functionally dependent on a subset of any candidate key.

BCNF SALARY, PAYMENT, TAX, and DEDUCTION TABLE:

- Each table has a primary key that determines all other attributes in the table (SALARY_ID, PAYMENT_ID, TAX_ID, DEDUCTION_ID respectively).
- There is no transitive dependency
- All non-key attributes are fully functionally dependent on the primary key.

ADVANCED QUERIES TABLES:

The advanced queries are to fetch the data and do not affect the normalization process of the underlying tables.

VIEWS TABLES:

The views EmployeeTotalAmount and EmployeeDeductionsTaxes do not need normalization since they are just projections and do not store data themselves.

FUNCTIONAL DEPENDENCIES:

The functional dependencies are listed below:

- DESIGNATION Table:
    - ‘DESIGNATION_ID’ → ‘TITLE’

The DESIGNATION_ID is a primary key which uniquely identifies each record. There are no non-prime attributes as TITLE is dependent on DESIGNATION_ID. Hence, it is in BCNF because every determinant is a candidate key.

- EMPLOYEE Table:
    - ‘EMPLOYEE_ID’ → ‘NAME’, ‘DESIGNATION_ID’

EMPLOYEE_ID is the primary key. There are no partial dependencies as no subset of EMPLOYEE_ID can determine another attribute, and no transitive dependencies as NAME and DESIGNATION_ID are only dependent on EMPLOYEE_ID and not on each other or any other non-prime attribute. Thus, the EMPLOYEE table is in BCNF.

- SALARY Table:
    - ‘SALARY_ID’ → ‘EMPLOYEE_ID’, ‘AMOUNT’

The SALARY_ID is a primary key. Each SALARY_ID uniquely determines the EMPLOYEE_ID and the AMOUNT. There are no attributes that depend on another non-prime attribute. Hence, the SALARY table is in BCNF

- PAYMENT Table:
    - ‘PAYMENT_ID’ → ‘EMPLOYEE_ID’, ‘AMOUNT’, ‘DATE_RECEIVED’

The PAYMENT_ID is the primary key and the only determinant in the table. Since no attribute depends on anything other than the primary key, the PAYMENT table is in BCNF.

- TAX Table:
    - ‘TAX_ID’ → ‘EMPLOYEE_ID’, ‘TAX_AMOUNT’

In this table, TAX_ID is a primary key and the sole determinant. Since all other attributes are dependent only on the primary key, there are no transitive dependencies. The TAX table is in BCNF.

- DEDUCTION Table:
    - ‘DEDUCTION_ID’ → ‘EMPLOYEE_ID’, ‘DEDUCTION_AMOUNT’, ‘REASON’

DEDUCTION_ID is a primary key, and all attributes in the table are functionally dependent on it. There are no transitive dependencies, so the DEDUCTION table is in BCNF.