A screenshot of a document

AI-generated content may be incorrect.

1. Anomalies
2. Insert anomaly

* Add a new hotel like H1 location in Fairfield but doesn’t have any employee to the table. But table requirement employee information and contract Number.

1. Update anomaly

* Update H4 location require update both rows contain NIN = 1068 and NIN = 1135. In case 1 row miss update, table data become inconsistent.

1. Delete anomaly

* Delete contract C1025 also remove working history of employee Smith J at H4 Glasgow

1. Attributes in the table:

NIN: National Insurance Number (unique for each staff member)

contractNo: Contract number for the staff member

hours: Hours worked by the staff member

eNAME: Employee name

hNo: Hotel number

hLoc: Hotel location

Function Dependencies:

* NIN → eNAME

Since NIN is unique for each staff member, it determines the staff member’s name (eNAME)

* hNo → hLoc

Each hotel (hNo) has a single location (hLoc). H25 is always in East Kilbride.

* NIN, contractNo → hours

From NIN and contract Number can determine Hours. 1135 and C1024 get 16

Assumptions:

NIN is unique for each staff member.

eNAME is the name of the staff member, which is determined by their NIN.

hNo uniquely identifies a hotel, and each hotel has a single location (hLoc).

contractNo and hours are specific to the staff member’s work at a particular hotel.

1. Normalize to 3NF
   1. 1NF: In this table: each column contains atomic values, and each column has unique values and

This table in 1NF

* 1. 2NF: No partial dependency exists.

Primary Key: (NIN, contractNo)

Covert to 2NF

Employee Table: Primary key: NIN

|  |  |
| --- | --- |
| NIN | eName |
| 1057 | Hocine D |
| 1068 | White T |
| 1135 | Smith J |

Employee and Contract

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NIN | contractNo | hours | hNo | hLOC |
| 1135 | C1024 | 16 | H25 | East Kilbride |
| 1057 | C1024 | 24 | H25 | East Kilbride |
| 1068 | C1025 | 28 | H4 | Glasgow |
| 1135 | C1025 | 15 | H4 | Glasgow |

* 1. 3NF: No transitive dependency exists

Hotel table: Primary key: hNo

|  |  |
| --- | --- |
| hNo | hLOC |
| H25 | East Kilbride |
| H4 | Glasgow |

Employee table: Primary key: NIN

|  |  |
| --- | --- |
| NIN | eName |
| 1057 | Hocine D |
| 1068 | White T |
| 1135 | Smith J |

Employee Contract table: Primary key: (NIN, contractNo)

Foreign key: hNo

|  |  |  |  |
| --- | --- | --- | --- |
| NIN | contractNo | hours | hNo |
| 1135 | C1024 | 16 | H25 |
| 1057 | C1024 | 24 | H25 |
| 1068 | C1025 | 28 | H4 |
| 1135 | C1025 | 15 | H4 |