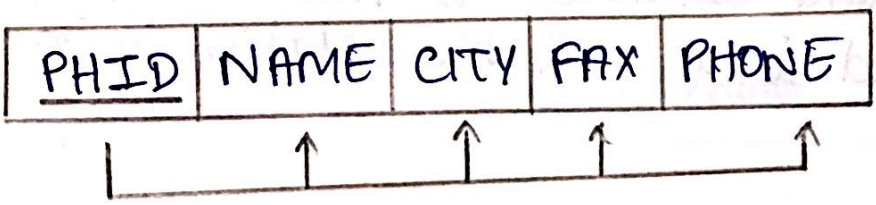
NORMALISATION

① PHARMACY :



FD(s) :

PHID ⟶ { NAME, CITY, FAX, PHONE }

1NF : This states that an attribute must include only atomic values.
else, the table should be decomposed.

⇒ Since all the attributes of PHARMACY have atomic values, the relation is already in 1NF.

2NF : This rule states that a relation is in 2NF if all the non-prime attribute of the relation are fully functional dependent on the primary key.
Else, the relation is decomposed.

⇒ Since all the non-primary attributes of the relation are fully functional dependent on the primary key, the relation is in 2NF.

3NF : This rule states that a relation R is in 3NF form if it is in 2NF and no non-prime attribute is transitively dependent on the primary key.

Else, the table is decomposed.

⇒ Since no non-prime attribute is transitively dependent on the primary key and is in 2NF, the relation is in 3NF.

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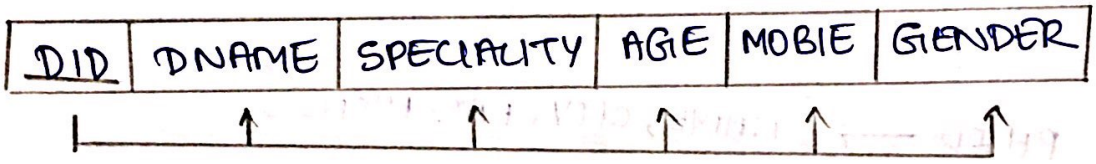
② DOCTOR :



FD(s) :

DID → [DNAME, SPECIALITY, AGIE, MOBILE, GIENDER]

1NF : Relation (DOCTOR) is already in 1NF as all the attributes of the relation have atomic values.

⇒ Hence no need to decompose the table.

2NF : The Relation (DOCTOR) is in 2NF as all the non-prime attributes are fully dependent on the primary key. and also it is in 1NF.

3NF : The relation (DOCTOR) is already in 3NF as no no-prime attribute is dependent on the candidate key and the relation is in 2NF

⇒ Hence no need to decompose the table.

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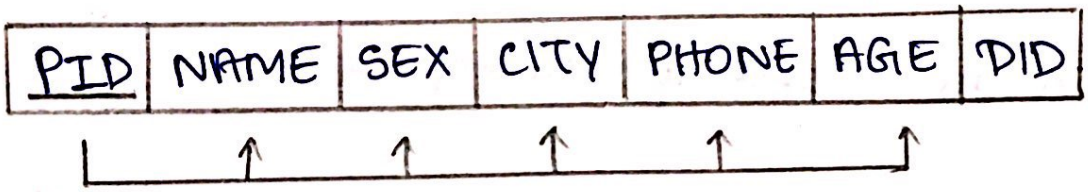
③ CUSTOMER :



PID → [NAME, SEX, CITY, PHONE, AGE]

1NF : The Relation (CUSTOMER) is already in 1NF as all the attributes have atomic values.

⇒ Hence no need to decompose

2NF : The Relation (CUSTOMER) is in 2NF as all the non-prime attributes of the relation are fully functionally dependent on the primary key and is in 1NF

⇒ Hence no need to decompose.

3NF : The Relation (CUSTOMER) is in 3NF as no non-prime attributes are transitively dependent on the candidate keys, as is in 2NF.

⇒ Hence no need to decompose.

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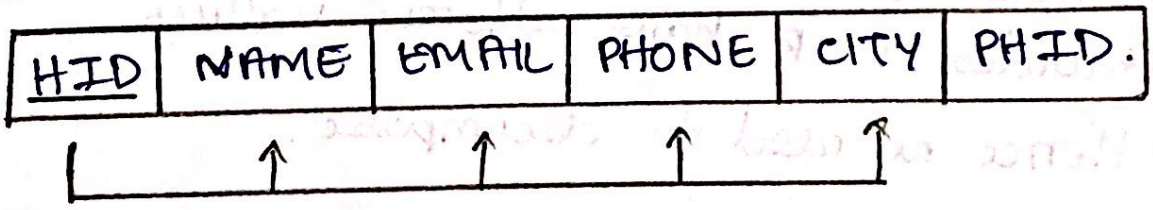
④ HOSPITAL :



FD(s) : HID ⟶ [NAME, EMAIL, PHONE, CITY]

INF : The relation R (HOSPITAL) is in INF as all the attribut of the relation have atomic values.

⇒ Hence no need to decompose.

2NF : The relation R (HOSPITAL) is in 2NF as all the non-prim attributes of R are fully dependent on the primary keys and it is in INF.

⇒ Hence no need to decompose.

3NF : The relation R (HOSPITAL) is in 3NF as no non-prime attribute of R are transitively dependent on the candidate keys, and it is in 2NF.

⇒ Hence no need to decompose.

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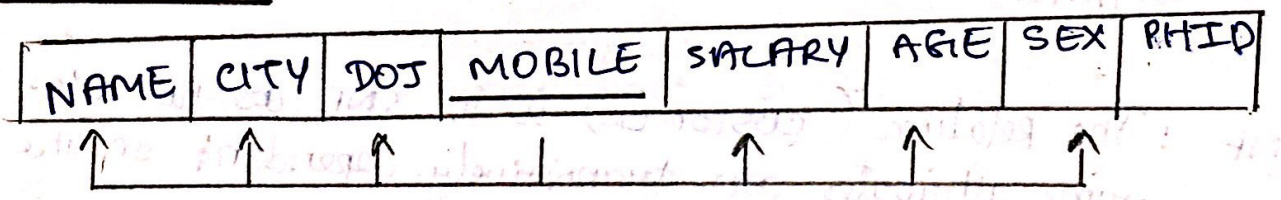
⑤ EMPLOYEE :



FD(s) :

MOBILE ⟶ { NAME, CITY, DOJ, SALARY, AGE, SEX }

INF : The relation R (EMPLOYEE) is in INF as all the attributes in R have atomic values

⇒ Hence no need to decompose.

2NF: The relation R (EMPLOYEE) is in 2NF as all the non-prime attributes in R are fully dependent on the primary keys, and as it is in 1NF.

⇒ Hence no need to decompose.

3NF: The relation R (EMPLOYEE) is in 3NF as no non-prime attribute is transitively dependent on the candidate keys, and as it is in 2NF.

⇒ Hence no need to decompose.

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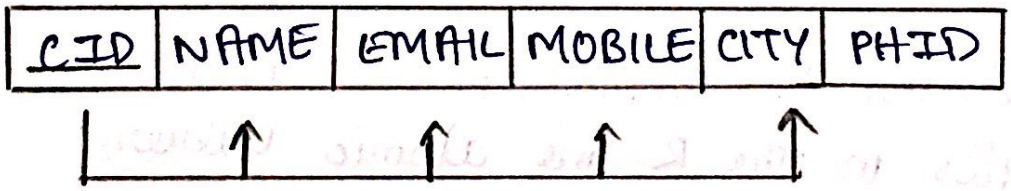
⑥ **MANUFACTURER**:



FD(s):

$$CID \rightarrow [NAME, EMAIL, MOBILE, CITY]$$

1NF: The relation R (MANUFACTURER) is in 1NF as all the attributes in R have atomic values.

⇒ Hence no need to decompose.

2NF : The relation R (MANUFACTURER) is in 2NF as all the non-prime attributes are fully dependent on the primary keys and as the relation is in INF.

⇒ Hence no need to decompose.

3NF : The relation R (MANUFACTURER) is in 3NF as no non-prime attributes are transitively dependent on the candidate keys and as the relation is in 2NF.

⇒ Hence no need to decompose.

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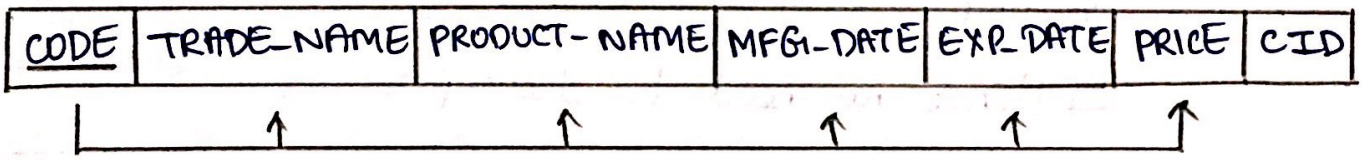
⑦ MEDIQUIPMENT :



FD(s) : CODE → {TRADE-NAME, PRODUCT_NAME, MFG-DATE, EXP_DATE, PRICE}

INF : The relation R (MEDIQUIPMENT) is in INF as all the attributes in the R are atomic values.

⇒ Hence no need to decompose.

2NF : The relation R (MEDIQUIPMENT) is in 2NF as all the non-prime attributes of R are fully dependent on the primary keys, and as the Relation is in INF.

⇒ No need to decompose further.

3NF: The Relation R (MEDIQUIPMENT) is in 3NF as no non-prime attributes of R are transitively dependent on the candidate keys and the Relation (R) is in 2NF.

⇒ no need to decompose further.

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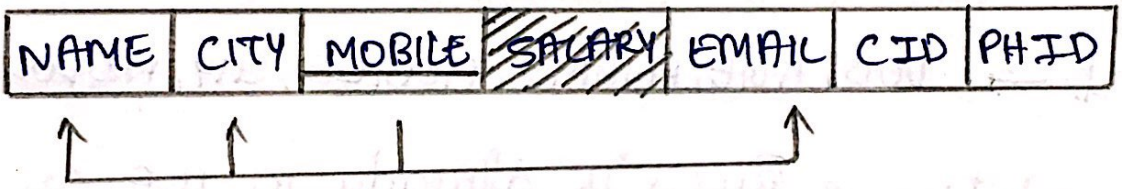
⑧ SUPPLIER



FD(s): MOBILE → {NAME, CITY, EMAIL}

INF: The relation R (SUPPLIER) is in INF as all the attributes in R are having atomic values

⇒ Hence no need to decompose.

2NF: The relation R (SUPPLIER) is in 2NF as all the non-prime attributes of R are fully dependent on the primary keys and the relation R is in 2NF.

⇒ Hence no need to decompose

3NF: The relation R (SUPPLIER) is in 3NF as no non-prime attribute is dependent (transitively) on candidate keys and the Relation R is in 2NF

⇒ Hence no further decomposition needed.

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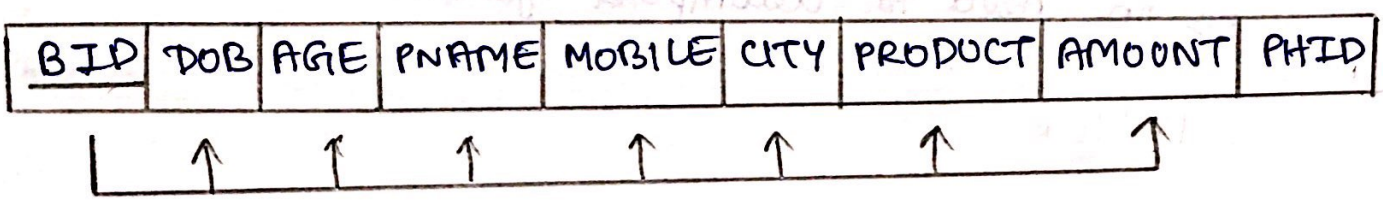
⑨ **BILL**:



FD(s): BID → {DOB, AGE, PNAME, MOBILE, CITY, PRODUCT, AMOUNT}

1NF: The Relation R (BILL) is already in 1NF as all the attributes are having atomic values.

⇒ Hence no need to decompose further.

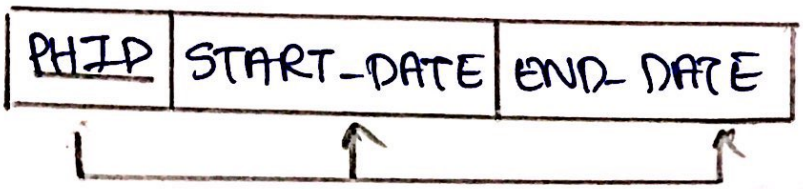
2NF: The relation R (BILL) is in 2NF as all the non-prime attributes are fully dependent on primary keys and the relation R is in 1NF.

⇒ Hence no need to decompose further.

3NF: The relation R (BILL) is in 3NF as no non-prime attributes are transitively dependent on candidate keys and the relation R is in 2NF

⇒ Hence no further decomposition required.

(10) WORK :



FD(s) : PHID → {START-DATE , END-DATE }

1NF : The relation R (WORK) is in 1NF as all the attributes of Relation R are atomic values

⇒ Hence no need to decompose.

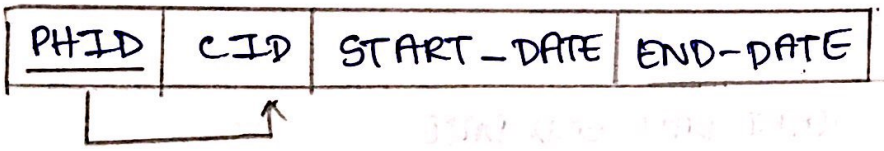
2NF : The relation R (WORK) is in 2NF as all the non-prime attributes of Relation R are fully independent on the primary keys and the relation R is in 1NF.

⇒ Hence no need to decompose further.

3NF : The Relation R (WORK) is in 3NF as no non-prime attributes are transitively dependent on the candidate keys and the relation R is in 2NF.

⇒ Hence no need to decompose further.

(11). CONTRACT :



FD(s) : PHID → {CID}

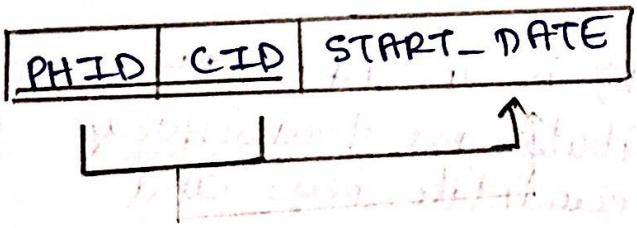
INF : The Relation R (CONTRACT) is in INF as all the attributes have atomic values.

⇒ Hence no need to decompose.

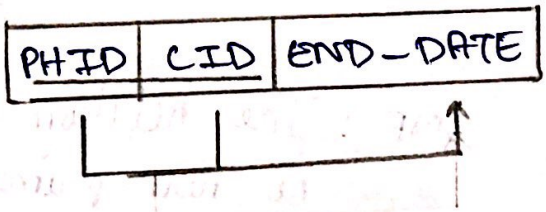
2NF : The relation R (CONTRACT) is not in 2NF as a few non-prime ~~key~~ attributes are not fully independent (partial) dependent.

⇒ Hence we need to decompose.

CONTRACT (1) :



CONTRACT (2) :



⇒ CONTRACT (1) and CONTRACT (2) are in 2NF and INF.

3NF : The Relation R1 (CONTRACT(1)) and R2 (CONTRACT(2)) is in 3NF as no non-prime attribute are transitively dependent on the candidate keys and they both are in 2NF

⇒ Hence no need to decompose further.

(12) PRESCRIBE :

FD(s) : DID → {PID}

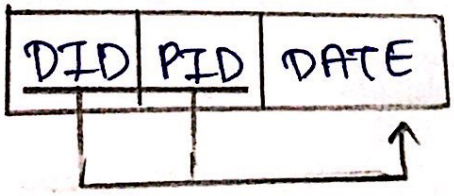
INF : The Relation R (PRESCRIBE) is in INF as all the attributes of R are having atomic values.

⇒ Hence no need to decompose. further.

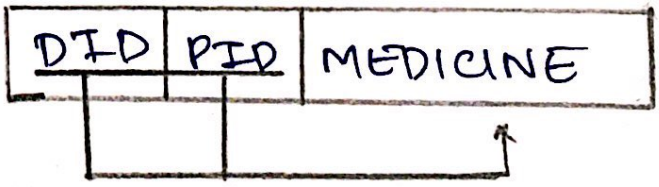
2NF : The relation R (PRESCRIBE) is not in 2NF as not all the non-prime attributes are fully dependent (PARTIAL) on the primary key

⇒ Hence we need to decompose the Relations.

PRESCRIBE (1) :



PRESCRIBE (2) :



Now both the relations R_1 (PRESCRIBE) and R_2 (PRESCRIBE) are in 2NF as the non-prime attributes are fully dependent on the prime keys and the relations R_1 and R_2 Both are in 1NF.

3NF : Decomposed Relations R_1 (PRESCRIBE(1)) and R_2 (PRESCRIBE (2)) are both in 3NF as no non-prime attribute is transitively dependent on the candidate keys and both the Relations R_1 and R_2 are in 2NF

$\Rightarrow$ Hence no need to decompose further.
