2NF Example

Condition: 1) Relation should be in 1NF.

2) No partial dependencies.

Partial Dependencies: Proper subset of CK --> Non prime attributes.

Example: ABC is CK and Proper subset of CK are {A, B, C, AB, BC, AC}

Example 1:

Consider a Relation R(A,B,C,D,E,F) and

FD = { A --> B, B -->C, C --> D, D --> E} Is this relation in 2NF**?**

Answer:

1) It is in 1NF.

2) To find all CK for above relation.

Is AF candidate key:

A+ = {ABCDE}

F+ = {F}

Hence AF is CK

Prime attributes : A and F. Non Prime attributes : B, C, D, E

More CK?? No because A and F are not on RHS of FD. Hence only one CK AF.

Partial dependencies is there as A -->B.

Hence it is not in 2NF.

Example 2:

Consider a relation R (A,B,C,D) and

FD = { AB --> CD, C --> A, D --> B} Is this relation in 2NF**?**

Answer:

1) It is in 1NF.

2) To find all CK for above relation.

AB is CK?

A+ = {A}

B+ = {B}

AB is a CK

Prime attributes : A and B Non Prime attributes : C and D

More CK?? Yes because prime attribute A and B are present in RHS of FD.

Replace A with C. Hence BC

B+ = {B}

C+ = {CA} BC is CK

Prime attributes : A, B and C

Replace B with D, hence AD

A+ = {A}

D+ = {DB} AD is CK

Prime attributes : A, B, C and D

C and D both are on RHS of FD. But here AB is already candidate key

Hence for above relation CK are = {AB, BC, AD}

Since all are prime attributes, hence above relation is in 2NF.

Example 3:

Consider a relation R (A,B,C,D) and
FD = { A --> B, B --> C, C --> D} Is this relation in 2NF**?**

Answer:

1) It is in 1NF.
2) To find all CK for above relation.

A is CK.

Prime Attribute A Non Prime attribute B, C and D

This is in 2NF.