National Institute of Electronics & Information Technology (NIELIT), Gorakhpur
राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान ,गोरखपुर

रा.इ.सू.प्रौ.सं
NIELIT

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Database Normalization – First Normal Form

✤ First Normal Form (1NF)

First normal form defines that each attribute in a relation (table) must have atomic (single) value. **No multi valued attribute is allowed according the rule of 1NF**.

The rule of 1NF also says that:

- Each column (attribute) in the table must have unique name.
- There must be domain defined for each column. A domain is collection of all possible values from which the value for column can be drawn.
- The order of columns in which they are arranged, it doesn't matter.

Suppose a following employee table:

eid	ename	emobile
101	Shyam	754345, 543453
102	Rakesh	345433
103	Kritika Singh	985625, 784765
104	Shyam	652345, 548234

The table is not in 1NF, because "emobile" attribute is multi valued attribute. The values in "emobile" attribute for "eid" 101 and 103 violates the rule of 1NF.

Therefore, to convert it into 1NF, It should have like:

Design1: A new row is proposed for every value of emobile value

eid	ename	emobile
101	Shyam	754345
101	Shyam	543453
102	Rakesh	345433
103	Kritika Singh	985625
103	Kritika Singh	784765
104	Shyam	652345
104	Shyam	548234

Or

Design2: A separate attribute is introduced for holding second value of emobile:

eid	ename	emobile1	emobile2
101	Shyam	754345	543453
102	Rakesh	345433	
103	Kritika Singh	985625	784765
104	Shyam	652345	548234

Both above designs follow the rules of first normal form, but design 2 is better than design 1 because design 1 introduces data redundancy.

Exercise:

1. What are the conditions that need to be satisfied for the table to be in first normal form? Explain with taking proper example.