NORMAL FORMS IN DATABASE DESIGN

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DATABASE THEORY HAS GIVEN US STANDARD RULES TO TEST IF A TABLE (RELATION) IS WELL DESIGNED

THESE RULES ARE CODIFIED INTO NORMAL FORMS

THE NORMAL FORMS ARE VERY INACCESSIBLE

BUT IF YOU CAN UNDERSTAND THEM, THEY ACTUALLY ROCK

1NF "1ST NORMAL FORM"

"A RELATION IS IN FIRST NORMAL FORM IF THE DOMAIN OF EACH ATTRIBUTE CONTAINS ONLY ATOMIC (INDIVISIBLE) VALUES, AND THE VALUE OF EACH ATTRIBUTE CONTAINS ONLY A SINGLE VALUE FROM THAT DOMAIN."

ERR, WHATEVER.

1NF "1ST NORMAL FORM"

LET'S TRY AGAIN.

A TABLE SHOULD NOT HAVE ANY COLUMN WITH CONCATENATED, COMPOUND VALUES

1NF "1ST NORMAL FORM"

A TABLE SHOULD NOT HAVE ANY COLUMN WITH CONCATENATED, COMPOUND VALUES

StudentID	Student_FirstName_LastName	Major_GraduatingClass
1	Mickey Mouse	CS_2019
2	Donald Duck	ECE_2018

1NF "1st Normal Form"

A table should not have any column with concatenated, compound values

Split these columns in two

StudentID	Student_FirstName_LastName	Major_GraduatingClass
1	Mickey Mouse	CS_2019
2	Donald Duck	ECE_2018

1NF "1st Normal Form"

A table should not have any column with concatenated, compound values

StudentID	FirstName	LastName	Major	GraduatingClass
1	Mickey	Mouse	CS	2019
2	Donald	Duck	ECE	2018

2NF "2ND NORMAL FORM"

"A TABLE IS IN 2NF IF IT IS IN 1NF AND NO NON-PRIME ATTRIBUTE IS DEPENDENT ON ANY PROPER SUBSET OF ANY CANDIDATE KEY OF THE TABLE. (A NON-PRIME ATTRIBUTE OF A TABLE IS AN ATTRIBUTE THAT IS NOT A PART OF ANY CANDIDATE KEY OF THE TABLE)"

ERR, WHATEVER...

2NF "2ND NORMAL FORM"
LET'S TRY AGAIN.

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

StoreID	ProductId	Date	Revenue	CategoryManager
Bellandur	Bananas	18-Jan-2016	2345.67	Mickey Mouse
Koramangala	Bananas	18-Jan-2016	8979.11	Donald Duck

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

PRIMARY KEY COLUMNS

StoreID	ProductId	Date	Revenue	CategoryManager
Bellandur	Bananas	18-Jan-2016	2345.67	Mickey Mouse
Koramangala	Bananas	18-Jan-2016	8979.11	Donald Duck

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

PRIMARY KEY COLUMNS   NON KEY COLUMNS

StoreID	ProductId	Date	Revenue	CategoryManager
Bellandur	Bananas	18-Jan-2016	2345.67	Mickey Mouse
Koramangala	Bananas	18-Jan-2016	8979.11	Donald Duck

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

PRIMARY KEY COLUMNS

REVENUE IS CLEARLY "IDENTIFIED" BY THE KEY..

StoreID	ProductId	Date	Revenue	CategoryManager
Bellandur	Bananas	18-Jan-2016	2345.67	Mickey Mouse
Koramangala	Bananas	18-Jan-2016	8979.11	Donald Duck

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

PRIMARY KEY COLUMNS

BUT CATEGORY MANAGER IS NOT..

StoreID	ProductId	Date	Revenue	CategoryManager
Bellandur	Bananas	18-Jan-2016	2345.67	Mickey Mouse
Koramangala	Bananas	18-Jan-2016	8979.11	Donald Duck

2NF "2ND NORMAL FORM"

A TABLE SHOULD HAVE EVERY NON-KEY COLUMN FULLY DEFINED BY OR DEPENDENT ON A PRIMARY KEY

PRIMARY KEY COLUMNS

CREATE A PRODUCT TABLE AND PUT CATEGORY MANAGER THERE

StoreID	ProductId	Date	Revenue
Bellandur	Bananas	18-Jan-2016	2345.67
Koramangala	Bananas	18-Jan-2016	8979.11

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF (1) THE ENTITY IS IN 2NF, AND (2) ALL THE ATTRIBUTES IN A TABLE ARE DETERMINED ONLY BY THE CANDIDATE KEYS OF THAT TABLE AND NOT BY ANY NON-PRIME ATTRIBUTES"

ERR, WHATEVER.

3NF "3RD NORMAL FORM"
LET'S TRY AGAIN.

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

StoreID	Store Address	StoreCity	StoreCountry
1	Bellandur opp Sakra Hospital	Bangalore	India
2	Koramangala opp Wipro Park	Bangalore	India

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

PRIMARY KEY COLUMNS

StoreID	Store Address	StoreCity	StoreCountry
1	Bellandur opp Sakra Hospital	Bangalore	India
2	Koramangala opp Wipro Park	Bangalore	India

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

PRIMARY KEY COLUMNS   NON KEY COLUMNS

StoreID	Store Address	StoreCity	StoreCountry
1	Bellandur opp Sakra Hospital	Bangalore	India
2	Koramangala opp Wipro Park	Bangalore	India

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

PRIMARY KEY COLUMNS

CITY AND COUNTRY FOLLOW FROM STORE LOCATION..

StoreID	Store Address	StoreCity	StoreCountry
1	Bellandur opp Sakra Hospital	Bangalore	India
2	Koramangala opp Wipro Park	Bangalore	India

3NF "3RD NORMAL FORM"

"A TABLE IS IN 3NF IF ALL NON-KEY COLUMNS ARE INDEPENDENT OF EACH OTHER"

PRIMARY KEY COLUMNS

StoreID	Store Address
1	Bellandur opp Sakra Hospital
2	Koramangala opp Wipro Park

MOVE STORE CITY AND COUNTRY INTO A SEPARATE TABLE KEYED BY STORE LOCATION