

Homework 4

Normal Form

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Is This Relation in at Least 1NF? Why or Why Not?

GIRL	GROUP	AGE	GAME	CATEGORY	PRICE
Charlotte	5 year olds	5	Mirror	Makeup	4.88
Susan	6 year olds	6	Lipstick	Makeup	5.95
Jane	5 year olds	5	Chess	Games	7.55
Susan	6 year olds	6	Checkers	Games	5.95
Susan	6 year olds	6	Mirror	Makeup	4.88
Carrie	6 year olds	6	Lipstick	Makeup	5.95
Jacqueline	5 year olds	5	Visual Basic	Prog. Languages	199.99

Yes, it is at least 1NF. To be in 1NF, the relation must be such that each table cell contains a single value, and each record has to be unique. This relation passes both of those.

What Is the Primary Key of the Initial Relation (Assume the Values Shown Are the Only Possible Tuples for all Time)? Remember That a Primary Key Must Be Unique and Not Null.

The primary key of the initial relation is GIRL, assuming that these values shown are the only possible ones for all time. We only have their first names, so things could become an issue if another girl by the same name joins. It would be wise to eventually create a new CUSTOMER_ID for each.

Describe the specific data anomalies that exist if we delete the tuple containing Jacqueline.

If we DELETE the tuple containing Jacqueline, we will find ourselves with a “delete” data anomaly. She was the only entry with the “Visual Basic” in GAME and “Prog. Languages” in CATEGORY. She was also a part of the 5 year olds group, which would have been deleted.

Based on Your Diagram, What Normal Form Is the Initial Relation in? Why?

As I mentioned before, things would be difficult if another member with a similar name was entered into this relation. But if we assume that no such thing

would happen, the initial relation is in 2NF. This is because it does have a single column primary key: GIRL. It may have no transitive functional dependencies either, since all the values are “all time.” If this is true, and we never update records such as age (assuming they all have unique birthdays and don’t all age at the same time), there are no transitive functional dependencies. But I’m not sure if that is what is meant by the values are “all time.”

So, if values are truly all time and won’t ever change, the initial relation is in 3NF.

If Necessary, Decompose the Initial Relation Into a Set of Non-Loss 3NF Relations by Showing the Relations, Attributes, and Tuples. Show Complete Relations With Attribute Headings and all Data Values in the Tuples of Your Relations. Determine the Number of 3NF Relations You End Up With After Normalization, Write This Number, and Then Circle the Number.

