CMIS 320 Project 4

Examine the following relation and its attributes and answer the following questions. Assume these are the values for "all time". Assume girls with the same name are the same person.

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

For each question below, please be sure to review the course content for additional reference material.

1) Is this relation in at least 1NF? Why or why not?

2) 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.

3) Describe the specific data anomalies that exist if we DELETE the tuple containing Jacqueline.

4) Draw a functional dependency diagram for the initial relation. This diagram should agree with the primary key you selected in above. This can be drawn in any drawing tool.

5) Based on your diagram, what normal form is the initial relation in? Why?

6) 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.

Additional References:

- What is Normalization? https://www.guru99.com/database-normalization.html
- What is a Primary Key? https://www.techopedia.com/definition/5547/primary-key
- What are data anomalies? https://databasemanagement.fandom.com/wiki/Data_Anomalies
- What is a functional dependency diagram?
  https://www.dlsweb.rmit.edu.au/Toolbox/ecommerce/dad_respak/dad_tutorial/html/dad_db3f_tut.htm#:~:text=A%20set%20of%20Functional%20Dependencies,the%20direction%20of%20the%20dependency.
- The Third Normal Form. https://www.geeksforgeeks.org/third-normal-form-3nf/

Grading rubric

Attributes	Meets	Does Not Meet
Normal form	**20 points** Student correctly identifies normal form of initial relation	**0 points** Major error in identification of normal form or not specified
Primary key	**25 points** Student correctly identified primary key of initial relation	**0 points** Major error with identification of primary key or not specified
Data anomalies	**15 points** Student correctly describes data anomalies	**0 points** Major errors with description of data anomalies or not specified
Functional dependency diagram	**15 points** Student correctly develops functional dependency diagram of initial relation	**0 points** Major errors developing functional dependency diagram or not specified
Normalized 3NF relations	**25 points** Student correctly develops the proper set of 3NF relations via normalization	**0 points** Major errors in development of proper set of 3NF relations or not specified