Jamie Garcia: CMSC 320 – Project 4

1. Yes, this table is in at least 1NF. This is because each attribute in all rows is atomic meaning that each field is a single value. Looking at the table that is given, there is only one single value per attribute.
2. Looking at the table and relating it with information given specifically on the assignment, especially the statement “Assume girls with the same name are the same person” we can say that **GIRL** is a primary key. Also, given the statement on the assignment “Assume these are the values for “all time” that would mean **GAME** is also a primary key. **GIRL** provides attributes for **AGE** and **GROUP** and **GAME** provides attributes for **PRICE** and **CATEGORY.**
3. If we ran DELETE on the tuple that contains Jacqueline, we would not only lose the **GIRL** Jacqueline, but we would also be removing the data visual basic from GAME, programming languages from **CATEGORY** and the **PRICE** 199.99.
4. Based on the diagram the functional dependencies are GIRL --> GROUP, AGE. Then GROUP --> AGE. It can also be AGE --> GROUP. Lastly, GAME --> CATEGORY, PRICE. The primary keys would be GIRL and GAME. The initial relation is in 1NF. There are some dependencies like GAME to CATEGORY, GIRL to AGE, GAME to PRICE and GIRL to GROUP
5. This is my decomposition of the initial relation and set into non-loss 3NF form.

|  |  |
| --- | --- |
| **Girl** | **GIRL\_ID (PK)** |
| GIRL\_1 | Charlotte |
| GIRL\_2 | Susan |
| GIRL\_3 | Jane |
| GIRL\_4 | Carrie |
| GIRL-5 | Jacqueline |

Relation: GIRL

|  |  |
| --- | --- |
| **AGE(PK)** | **Group** |
| 5 | 5 Years Old |
| 6 | 6 Years Old |

Relation: Group Age

|  |  |  |
| --- | --- | --- |
| **GAME (PK)** | **CATEGORY\_ID (FK)** | **PRICE** |
| Mirror | CATEGORY\_1 | 4.88 |
| Chess | CATEGORY\_2 | 7.55 |
| Checkers | CATEGORY\_3 | 5.95 |
| Lipstick | CATEGORY\_4 | 5.95 |
| Visual Basic | CATEGORY\_5 | 199.99 |

Relation: Game

|  |  |
| --- | --- |
| **CATEGORY\_ID (PK)** | **Category** |
| CATEGORY\_1 | Makeup |
| CATEGORY\_2 | Games |
| CATEGORY\_3 | Programming Languages |

Relation: Category

|  |  |
| --- | --- |
| GIRL\_ID(PK) | AGE(FK) |
| GIRL\_1 | 5 |
| GIRL\_2 | 6 |
| GIRL\_3 | 5 |
| GIRL\_4 | 6 |
| GIRL\_5 | 5 |

Relation: GIRLS-GROUP AGE

|  |  |  |
| --- | --- | --- |
| RECORD\_ID(PK) | GIRL\_ID(FK) | GAME(FK) |
| RECORD\_1 | GIRL\_1 | Mirror |
| RECORD\_2 | GIRL\_2 | Lipstick |
| RECORD\_3 | GIRL\_3 | Chess |
| RECORD\_4 | GIRL\_4 | Checkers |
| RECORD\_5 | GIRL\_5 | Mirror |
| RECORD\_6 | GIRL\_6 | Lipstick |
| RECORD\_7 | GIRL\_7 | Visual Basic |

Relation: GIRLS-GAME