NORMALIZATION

Question 1: The below data is in first normal form (1NF). Normalize the data to the **second normal form (2NF),** showing all steps with explanations. All steps and the final answer must be in **dependency diagram format**.

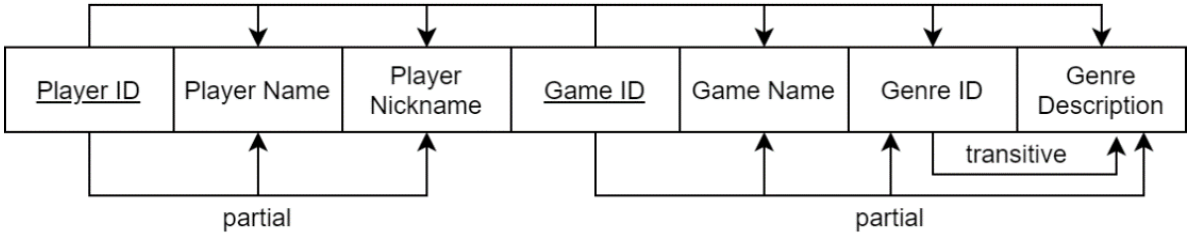
Primary Key: Player ID, Game ID

Player ID	**Player Name**	**Player Nickname**	**Game ID**	**Game Name**	**Genre ID**	**Genre Description**
1	Adrian	Red Devil	1	World of Warcraft	2	MMO
2	Bo	OctoPaul	1	World of Warcraft	2	MMO
2	Bob	OctoPaul	2	Warcraft III	1	Strategy
3	Rodney	Defender	1	World of Warcraft	2	MMO
3	Rodney	Defender	3	StarCraft II	1	Strategy

Question 2: Normalize the answer from Question 1 to the **third normal form (3NF),** showing all steps with explanations. The final answer must be in **dependency diagram format**.

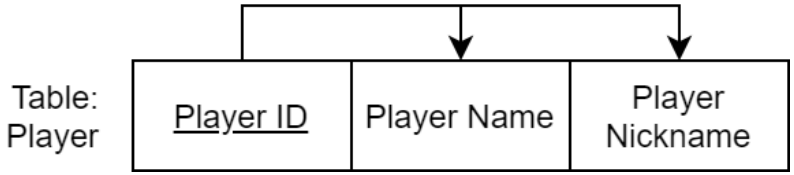
QUESTION 1 SOLUTION

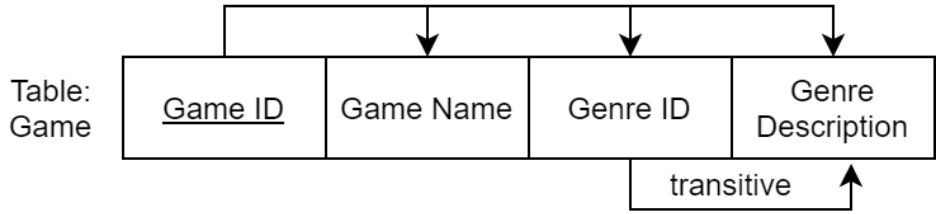
Dependency diagram in first normal form:



Create three tables: Player, Game, and PlayerGame

Second normal form dependency diagram: For data to be in second normal form, any partial dependencies must be removed.

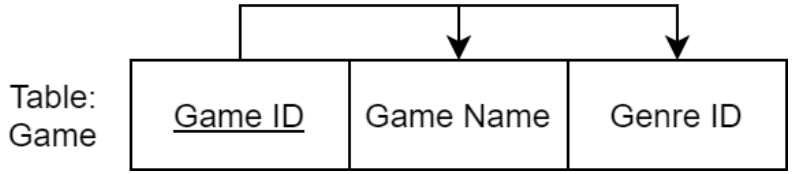


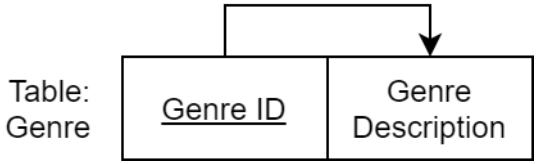


QUESTION 2 SOLUTION

For data to be in third normal form, any transitive dependencies that remain must be removed. There is one transitive dependency in the data: Genre Description depends on Genre ID. Create a new table called Genre, with columns Genre ID and Genre Description columns. (1) Genre ID then becomes a foreign key in table Game. (1)

Third normal form dependency diagram:





ERD CREATION

Question 3: Draw an Entity Relationship Diagram (ERD) using Unified Modelling Language (UML) notation according to the below business rules. Your design should be at the logical level – include primary and foreign key fields and remember to remove any many-to-many relationships.

Astronaut mission business rules:

- Every entity must have a surrogate primary key. See the ERD sheet for an example of a surrogate primary key.
- An astronaut lives in a specific country, and many astronauts can be from the same country.
- The name for each astronaut must be stored in the database.
- The name for each country must be stored in the database.
- An astronaut is assigned to a mission to perform a specific role on board a specific vehicle.
- An astronaut and a vehicle can be assigned to multiple missions over time.
- The start date and end date of each mission must be stored in the database.
- The model and name of each vehicle must be stored in the database.
- The description of each role must be stored in the database.

QUESTION 3 ERD SOLUTION: ensure you adhere to all rules as pointed out in the ERD Rule Sheet created and sent to you guys.