Video Game Platform DB

Scenario Overview

A company is building an online Video Game Platform like Steam or PlayStation Network. The platform stores information about players, games, game studios, downloadable content, and player activity. Your task is to design a conceptual database based only on the description below.

Read carefully. Important constraints are embedded in the text.

System Description

The platform allows players to create accounts and purchase video games.

Each player has a unique player ID, a username, an email address, and an account creation date. A player may own zero, one, or many games.

Each game has a unique game ID, a title, a release date, and a base price. A game is developed by exactly one game studio. A studio may develop many games or none at all. Each studio has a studio ID, name, and country.

Players can purchase the same game at different times. For each purchase, the system records the purchase date and price paid. A purchase cannot exist without both a player and a game.

Some games offer downloadable content (DLC). Each DLC belongs to exactly one game and cannot exist unless its game exists. A DLC has a name, release date, and additional cost. DLC names are only guaranteed to be unique within a game.

Players can earn achievements in games. Each achievement is defined by a game and has a name and description. Achievement names are only unique within a specific game. Players may earn many achievements per game, and the system records the date each achievement was earned. A player cannot earn an achievement for a game they do not own.

Players may play games together online. The platform tracks matches, where one or more players participate in a match for a specific game. Each match has a match ID, date, and duration. A match must be associated with exactly one game and at least one player.

Tasks

Task 1: Identify Entities

- List all entities implied by the description.
- Identify which entities are strong and which are weak.
- Explain why some entities cannot exist independently.

Task 2: Primary and Foreign Keys

For each entity:

- Choose a primary key
- Identify any foreign keys
- Justify composite keys where used

Task 3: Relationships

For each relationship:

- Name the relationship
- Identify connectivity (1:1, 1:M, M:N)
- Identify cardinality constraints
- Identify participation (total or partial)
- Decide whether the relationship is identifying or non-identifying

Task 4: Relationship Attributes

- Identify relationships that require attributes
- Explain why those attributes belong to the relationship instead of an entity

Task 5: ER Diagram

Create a conceptual ER diagram that clearly shows:

- Primary keys
- Weak entities and partial keys
- Identifying relationships
- Cardinality and participation constraints