Coursework in Principles and Practice of Database Systems

1   Instructions

This is an individual coursework assignment.

You are required to submit a zip file containing your answer sheet and the SQL dump file.

2   Scenario

Reference URL: https://en.wikipedia.org/wiki/League_of_Legends

2.1   Objective:

Design a database that captures the gaming mechanics of League of Legends gameplay, focusing on champion selection, match outcomes, player interactions, and game statistics.

2.2   Game Overview:

In League of Legends, players choose from over 140 champions to control in each match. These champions have unique abilities and playstyles, and they gain experience and gold throughout the match to upgrade their abilities and purchase items, enhancing their combat effectiveness. Players engage in combat with enemy champions, minions, and turrets to ultimately destroy the opposing team's Nexus.

2.3   Database Requirements:

. **Champion Customization:** Each champion can be equipped with a variety of items and runes that alter their stats and abilities. The database should track each champion's available items, runes, and their effects.

. **Match Details:** Record information about each match, including the participating champions, match duration, outcome (win/loss), and some other possible statistics. Matches are team-based, so information about team compositions and individual contributions should also be recorded.

. **Player Performance:** Track player statistics such as kills, deaths, assists, gold earned, and minions killed. Additionally, record player progress, including their champion mastery levels and rankings.

. **Item and Rune Inventory:** Maintain a catalog of all items and runes available in the game, including their cost, stats provided, and any special effects.

. **Team Dynamics:** Document team formations, with each team having up to five players. Include roles assumed by each player in the match (e.g., Top, Mid, Jungle, ADC, Support).

. **Champion Progression:** Players can unlock champions and skins through gameplay or purchases. The database should track which champions and skins a player owns, along with any progression or achievements related to each champion.

. **Matchmaking and Rankings:** Store data related to player rankings, match history, and the outcome of ranked matches to facilitate matchmaking and track player progression through the game's ranking system.

3   Assignments

1. List all the entity types. [4 marks]

2. List at least four or more attributes for each entity type. [8 marks]

3. Draw an ER diagram to illustrate how the entity types relate to each other. Include the cardinality ratio in your ER diagram. [18 marks]

4. List all the database tables, the columns, primary key and foreign keys. [20 marks]

5. Create the database tables in MySQL. Attach screenshots in your answer sheet. [10 marks]

6. Insert necessary records into each table to be able to run queries from Assignments (7)-(9). Attach screenshots in your answer sheet. [10 marks]

7. Create a query that retrieves statistics for players and champions they've played in League of Legends matches. It calculates the average kills, deaths, and assists per game for each player-champion combination, but only includes data for players who have played more than 10 games with a specific champion. The results are then ordered by average kills (in descending order), average assists (in descending order), and average deaths (in ascending order). Attach screenshots in your answer sheet. [10 marks]

8. Create a query that retrieves the popularity of item builds for each champion role in League of Legends matches. It counts the number of times each item was built by players in matches, grouped by champion, role, and item. The results are then ordered by the number of times the item was built in descending order. Attach screenshots in your answer sheet. [10 marks]

9. Create a query that finds the most common champion combinations in League of Legends matches. The query needs to ensure that only distinct pairs are counted. The results are then grouped by champion pairs and ordered by the count of occurrences in descending order, showing the top 10 most common combinations. Attach screenshots in your answer sheet. [10 marks]