CS486/586 Introduction to Databases

Fall 2018 Quarter

Assignment 4 Views, ER Diagrams – revised 2

Remember: The first midterm is Tuesday, 30 October, on material through PHP.

Due: Thursday, 25 October 2018 at the beginning of

class

You may do this assignment individually or you may work with one partner. That is, this assignment is to be completed by individuals or by teams of two students. You should only talk to the instructor, the TA and your partner about this assignment. You may also post questions to the Piazza discussion list.

Please turn in your completed assignments on paper. Put your last name, first name, the assignment number in that order in the first line of your assignment. List last name and first name for your partner, if you have one, on the second line of your assignment. (If you are working with a partner, turn in **one** assignment paper.)

Part I: Using Views

For this part, you will create tables and a view in your own database under your own account. You will be using the Pokemon Go data on Piazza. You can reuse commands from Assignment 3 as appropriate.

Question 1 (5 points). Create two tables for Characters and Special Moves information, as in Part I of HW2, with keys and foreign keys as specified there. Show the CREATE statements.

Question 2 (5 points). Insert rows into the Characters table for characters numbered 11-20. Show the full content of this table, but *do not* include your INSERT statements.

Question 3 (10 points). Create a view over the Character and Special Moves tables that has three columns, for character, character stamina and the

number of moves for that character. Show your view definition and the result it returns if you select all rows from it.

Question 4 (5 points). Add moves for characters 11-15 to the Special Moves table. Show the full set of rows for Special Moves.

Question 5 (5 points). Write a query that uses your view to find all characters and staminas for characters with more than two moves. Show your full result.

Question 6 (5 points). Add moves for characters 16-20 and rerun your query from Question 5. Show your full result.

Question 7 (5 points). Delete all "Aerial Ace" rows in the Special Moves table and rerun the query from Question 5. Show your DELETE statement and the full result of the query.

Question 8 (10 points). Compare the use of triggers versus views for handling move-count information. Under what circumstances would a trigger be preferable? Under what circumstances would a view be preferable?

Part II: Creating ER Diagrams

Question 9 (25 points): Consider the following scenario.

- A Pokémon character has a unique number; a name; stamina, attack and defense values; and a date introduced.
- A Pokémon type has a type name, a description and a type count (the number of characters with that type).
- A Pokémon type can be weak or strong against zero or more other types.
- Each Pokémon character has a primary type and possibly a secondary type.
- A move has a name, is either quick or special, and has an accuracy and power points.
- Each character has one or more moves.
- A creature is an instance of a Pokémon character. It has a unique sequence number within all creatures for that character, combat power (CP), and experience points (EP).
- A location is identified by its latitude and longitude. It also has a description.
- A gym has a unique gym name, is situated at a location and has a prestige value.
- A gym is occupied by zero or more creatures.

- A player has a unique account name, an email and a rating.
- A player can capture a creature at a location on a particular date. The player may give up the creature at a later date.
- A player can own zero or more creatures. Not every creature must be owned by a player, but it is never owned by two or more players.

Draw an ER diagram that represents this scenario. You can use conventional notation (rectangles, diamonds, ovals) or UML notation. (*If you use UML notation, be sure you are showing an ER diagram and not a schema diagram. If you are showing foreign keys, you have the wrong type of diagram.*) Be sure to mark the key attributes and include minimum and maximum cardinality constraints on relationships. You don't need to give the types of attributes.

For Questions 10-13 you should modify your ER diagram from Question 9 to handle the following changes in the scenario. Do each scenario as a separate change from the original diagram. You only need to show the parts of the diagram that change.

Question 10 (10 points): Each creature in a gym has a standing in that gym.

Question 11 (10 points): Each player can have zero or more nicknames for each creature he or she owns.

Question 12 (10 points): A player has an avatar with hair, skin and eye colors.

Question 13 (10 points): A character can evolve into another character.

Part III: Cardinality Constraints

Questions 14-16 concern the ER diagram below, representing medicines that contain active ingredients. For each different condition, show the ER diagram with the correct cardinality constraints. Show both maximum and minimum bounds.



Question 14 (5 points): A medicine has at least one active ingredient, and an ingredient can be used in any number of medicines.

Question 15 (5 points): A medicine has up to four active ingredients (and may have none), and every active ingredient is used in at least one medicine.

Question 16 (5 points): Every medicine has exactly one active ingredient, and an ingredient is never used in more than five medicines.