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CMSC 508

Problem Statement

MyDictionary is a database designed for users to create, save, and share personal dictionaries. My friends and I are always coming up with quotes, acronyms, and words with special meaning to us, but eventually we end up forgetting many of them. With MyDictionary, this will no longer be an issue. MyDictionary allows its users not only to quickly and easily write down quotes, acronyms, and new words with their respective definitions, but also provides a platform to share, favorite, and store them. The goal of MyDictionary is to empower users not only to remember their words, but also share them with others. MyDictionary has four key values: storing, sharing, favoriting, and privacy.

Storing

Memories are an important aspect of life, but sometimes memories fade away. This is why storing entries is the primary focus of MyDictionary. Even though some people may not come up with new words, quotes, or acronyms on a daily basis, having a place to store the important ones they do create is of great importance. Words, specifically quotes, have the ability to resurface long-forgotten memories within the human brain. My hope is that with MyDictionary, users will write down the quotes, acronyms, and words they created themselves or with friends and be able to remember and reflect on the events that led to the creation of these entries. Each user has a Library which contains all dictionaries they have created, as well as any dictionaries that have been shared with them. They may name dictionaries whatever they wish. The user can then create and store entries (quotes, words with definitions, and acronyms) in their dictionaries. Additionally, an “Entry of the Day” entity has been added in phase 2 of the project. The purpose of “Entry of the Day” is to highlight a random entry from the user’s library for 24 hours, so the user can resurface any old memories associated with that entry.

Sharing

Words bring people together, and learning new words and phrases is central to the development of a human. That is why sharing is a huge focus in MyDictionary. Users will create an account with a username, email, and display name. Each entry and dictionary created by a user in MyDictionary will have a unique identifier, which will allow users to instantly share their creations with other users, whether it be a single entry or an entire dictionary, sharing with friends or someone new. Each entry will also have an ID, author, and date-created attributes to inform users of origin information and allow shareability. Additionally, a "friends" relationship has been added in phase 2 of the project, which means users will now have the ability to become friends with each other within MyDictionary. Once users are friends, they can more easily access each other's creations. The goal of sharing is to allow people to expand their vocabulary, whether it be a new word with true meaning, or just a funny quote to share a laugh with a friend.

Favorites

Sometimes things can get messy quickly without organization. When a user creates a lot of entries for their dictionary/dictionaries, it is important that they still have quick access to the quotes, words, and acronyms they cherish the most. This is why MyDictionary will have a Favorites feature. Favorites is an initially empty list of entries that can be found outside of the dictionaries users create (the entry will not be removed from the dictionary it belongs to, it will still be accessible from both the dictionary It belongs to and the favorites list). When a user finds that an entry that they or someone else has created is worthy of being favorited, they simply click the "favorite" button for that entry and it will be added to their personal favorites list for easy access at a later time. Allowing the user to favorite entries is a central feature for easy access and remembrance within MyDictionary.

Privacy

Privacy is an important aspect in peoples' lives, especially on the internet. MyDictionary will take precautions for safety of user information. The biggest privacy feature in MyDictionary is that each user will have a collection of entry IDs they have access to, this way users can keep their entries private by default but may share their entries with other users. When a user shares

a dictionary or entry with another user, they are allowed to view or save that entry/dictionary to their collection. If the user chooses to save the shared dictionary, all entry IDs from that dictionary will all be added to the receiving user's library as a new dictionary, and if only one entry is shared, the user will be prompted to add it to an existing dictionary in their library.

Entities

User
Users of MyDictionary are required to have a login, which consists of an email, username, and password

Library
Every user has a Library. A Library is simply a collection of dictionaries filled with entries that a user has access to (whether they created it themselves or it was shared to them)

Entry of the Day
Entry of the day is a new feature which highlights an entry from the user's library (whether it be a shared entry or one created by the user) every 24 hours. This feature is aimed to offer users reflection and/or insight into their vocabulary. Entry of the Day contains a library ID it is associated with, unique entry of day ID, and the ID of the entry it is displaying that day

Dictionary
Each user starts with one dictionary, though they may create as many as they wish. Dictionaries have a name and ID and contain entries. They are initially empty, but users may add entries to them

Entry
Entries are the heart of MyDictionary. An entry can be either a quote, a word and its definition, or an acronym. Entries are readable solely by the creator and any users the creator wishes to share the entry with. Users create entries, then add them to a dictionary of their choosing. An entry consists of an ID, an author, and the date of creation

Word
A word consists of a word, its definition, and all attributes of an entry

Acronym
An acronym consists of an acronym, the phrase it stands for, and all attributes of an entry.

Quote
A quote consists of a quote, and all attributes of an entry

Favorites
Favorites consists of an ID and 0 or more entry IDs. The favorites list is a list of user-favorited entries. A user simply favorites an entry, and the ID of that entry is added to their personal favorites list

Tables

User (username *PRIMARY KEY*, email *UNIQUE NOT NULL*, first_name *NOT NULL*, last_name *NOT NULL*, password *NOT NULL*)

Library (library_id *PRIMARY KEY*, username *REFERENCES User.username NOT NULL*)

Library-Contains (library_id *REFERENCES Library.library_id PRIMARY KEY*, dictionary_id *REFERENCES Dictionary.dictionary_id PRIMARY KEY*)

Entry of the Day (entry_of_day_id *PRIMARY KEY*, entry_id *NOT NULL*, library_id *REFERENCES Library.library_id NOT NULL*)

Dictionary (dictionary_id *PRIMARY KEY*, creator_id *REFERENCES User.username NOT NULL*, name *NOT NULL*)

Dictionary-Contains (dictionary_id *REFERENCES Dictionary.dictionary_id PRIMARY KEY*, entry_id *REFERENCES Entry.entry_id PRIMARY KEY*)

Entry (entry_id *PRIMARY KEY*, author, date_created *NOT NULL*, creator_id *REFERENCES User.username NOT NULL*)

Entry-Word (entry_id *REFERENCES Entry.entry_id PRIMARY KEY*, definition *NOT NULL*, word *NOT NULL*)

Entry-Acronym (entry_id *REFERENCES Entry.entry_id PRIMARY KEY*, acronym *NOT NULL*, phrase *NOT NULL*)

Entry-Quote (entry_id *REFERENCES Entry.entry_id PRIMARY KEY*, quoted_text *NOT NULL*)

Favorites (favorites_id *PRIMARY KEY*, username *REFERENCES User.username NOT NULL*)

Favorites-Contains (favorites_id *REFERENCES Favorites.favorites_id PRIMARY KEY*, entry_id *REFERENCES Entry.entry_id PRIMARY KEY*)

Friends (username *REFERENCES User.username PRIMARY KEY*, friend_username *REFERENCES User.username PRIMARY KEY*)

Decomposition of functional dependencies into BCNF/4NF

User (*username, email, first_name, last_name, password*)

F = { username -> email, first_name, last_name, password }
CKs = { username }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Library (*library_id, username*)

F = { library_id -> username }
CKs = { library_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Library-Contains (*library_id, dictionary_id*)

F = { library_id -> dictionary_id }
CKs = { library_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Entry of the Day (*entry_of_day_id, entry_id, library_id*)

F = { entry_of_day_id -> entry_id, library_id }
CKs = { entry_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Dictionary (*dictionary_id, creator_id, name*)

F = { dictionary_id -> creator_id, name }
CKs = { dictionary_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Dictionary-Contains (*dictionary_id, entry_id*)

F = { dictionary_id -> entry_id }
CKs = { dictionary_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Entry (*entry_id, author, date_created, creator_id*)

F = { entry_id -> author, date_created, creator_id }
CKs = { entry_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Entry-Word (*entry_id, definition, word*)

F = { entry_id -> definition, word }
CKs = { entry_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Entry-Acronym (*entry_id, acronym, phrase*)

F = { entry_id -> acronym, phrase }
CKs = { entry_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Entry-Quote (*entry_id, quoted_text*)

F = { entry_id -> quoted_text }
CKs = { entry_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Favorites (*favorites_id, username*)

F = { favorites_id -> username }
CKs = { favorites_id }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Favorites-Contains (*favorites_id, entry_id*)

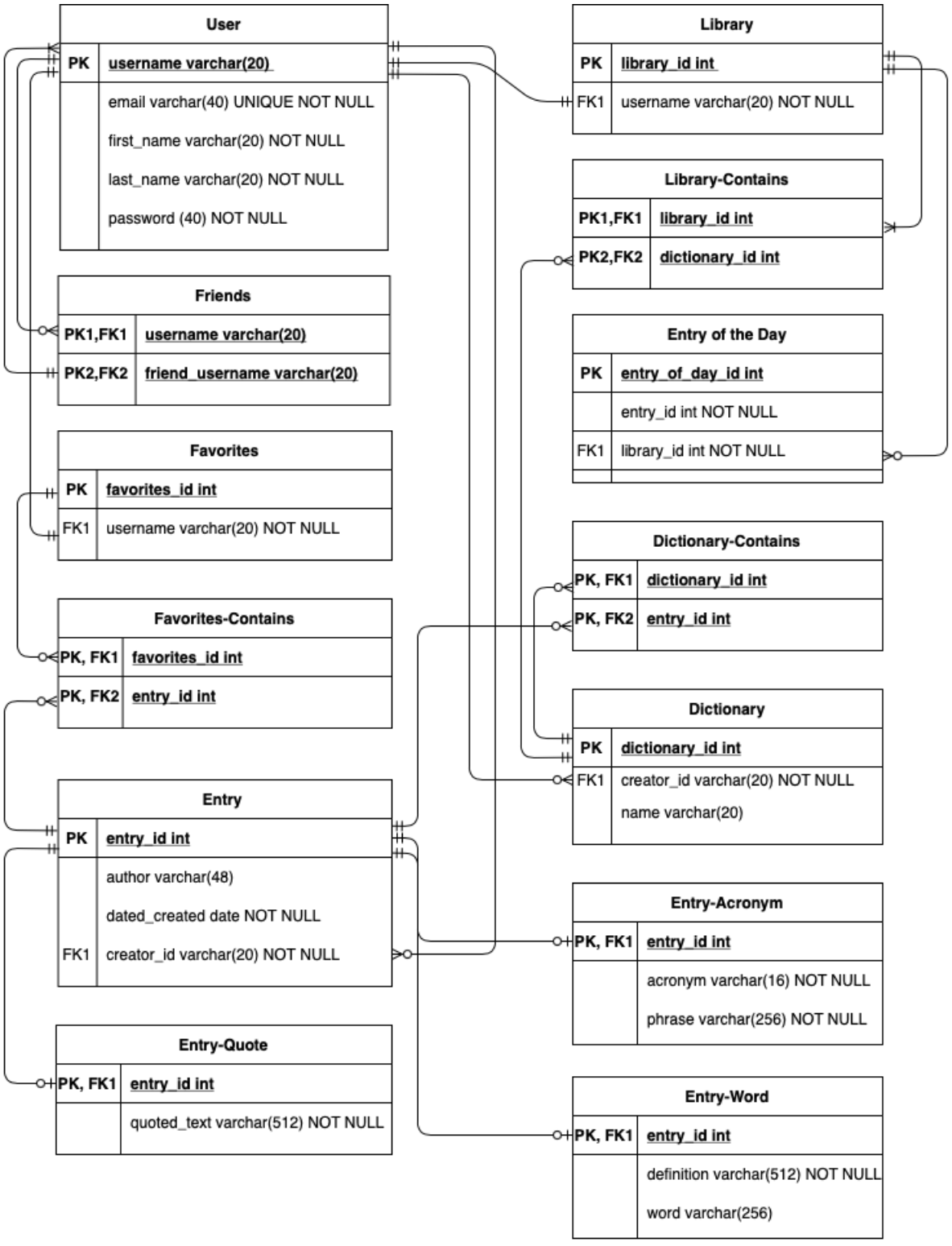
F = { favorites_id -> entry_id }
CKs = { favorites_id }

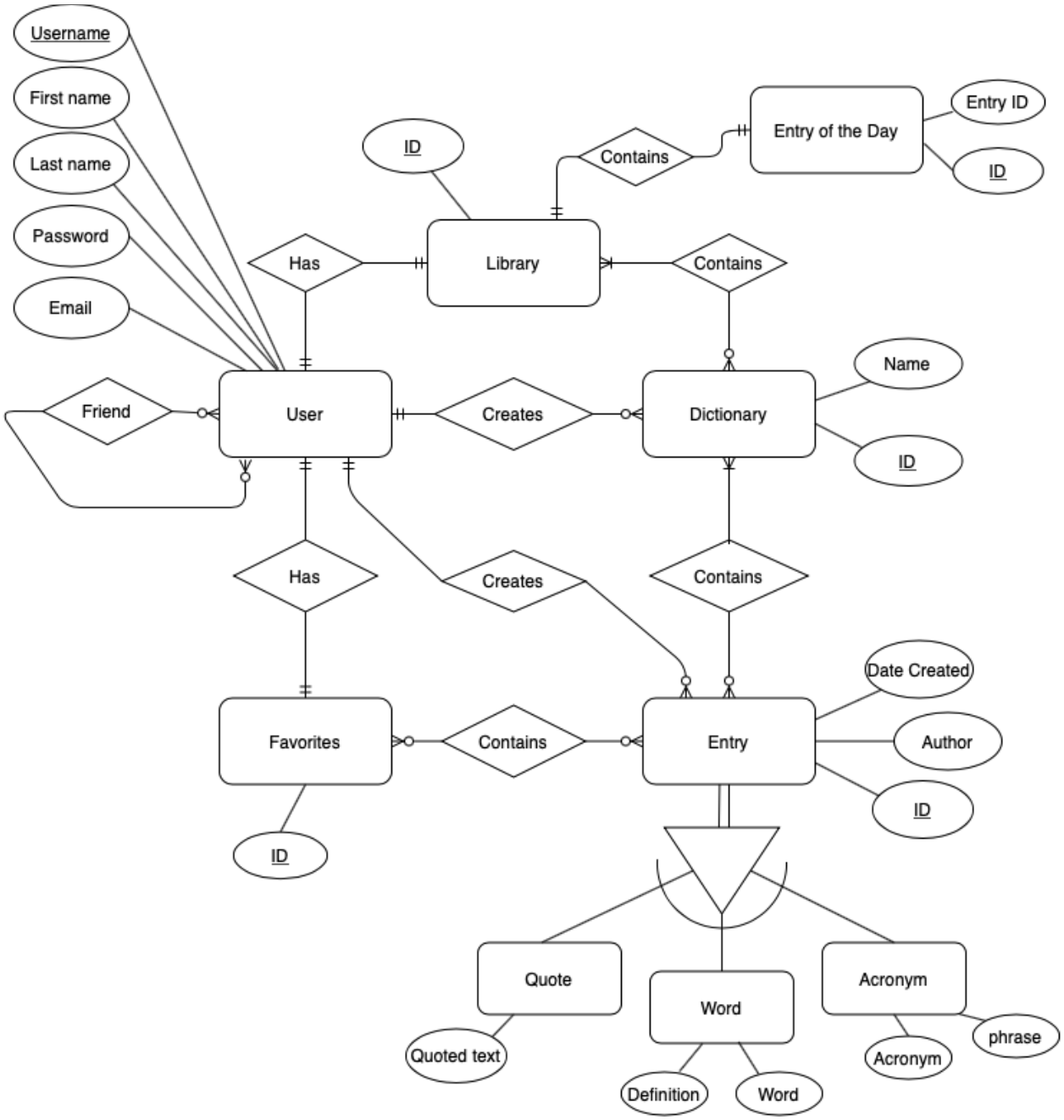
This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute

Friends (*username, friend_username*)

F = { username -> friend_username }
CKs = { username }

This relation is in BCNF because the antecedent of the only functional dependency is a prime attribute


User
PK
username varchar(20)
email varchar(40) UNIQUE NOT NULL
first_name varchar(20) NOT NULL
last_name varchar(20) NOT NULL
password (40) NOT NULL
Library
PK
library_id int
FK1
username varchar(20) NOT NULL
Library-Contains
PK1,FK1
library_id int
PK2,FK2
dictionary_id int
Friends
PK1,FK1
username varchar(20)
PK2,FK2
friend_username varchar(20)
Entry of the Day
PK
entry_of_day_id int
entry_id int NOT NULL
FK1
library_id int NOT NULL
Favorites
PK
favorites_id int
FK1
username varchar(20) NOT NULL
Dictionary-Contains
PK, FK1
dictionary_id int
PK, FK2
entry_id int
Favorites-Contains
PK, FK1
favorites_id int
PK, FK2
entry_id int
Dictionary
PK
dictionary_id int
FK1
creator_id varchar(20) NOT NULL
name varchar(20)
Entry
PK
entry_id int
author varchar(48)
dated_created date NOT NULL
FK1
creator_id varchar(20) NOT NULL
Entry-Acronym
PK, FK1
entry_id int
acronym varchar(16) NOT NULL
phrase varchar(256) NOT NULL
Entry-Quote
PK, FK1
entry_id int
quoted_text varchar(512) NOT NULL
Entry-Word
PK, FK1
entry_id int
definition varchar(512) NOT NULL
word varchar(256)


Username
First name
Last name
Password
Email
ID
Contains
Entry of the Day
Entry ID
ID
Has
Library
Contains
Friend
User
Creates
Dictionary
Name
ID
Has
Creates
Contains
Favorites
Contains
Entry
Date Created
Author
ID
ID
Quote
Word
Acronym
Quoted text
Definition
Word
Acronym
phrase