Database Systems:
Project Writeup/Report
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Project Description:

      This is a database system for a questions and answers website where students (users) post questions and answers regarding their courses, homework, and projects. Questions and answers on the site are visible by all visiters, but only students that sign up with a username and password can post questions and answers.
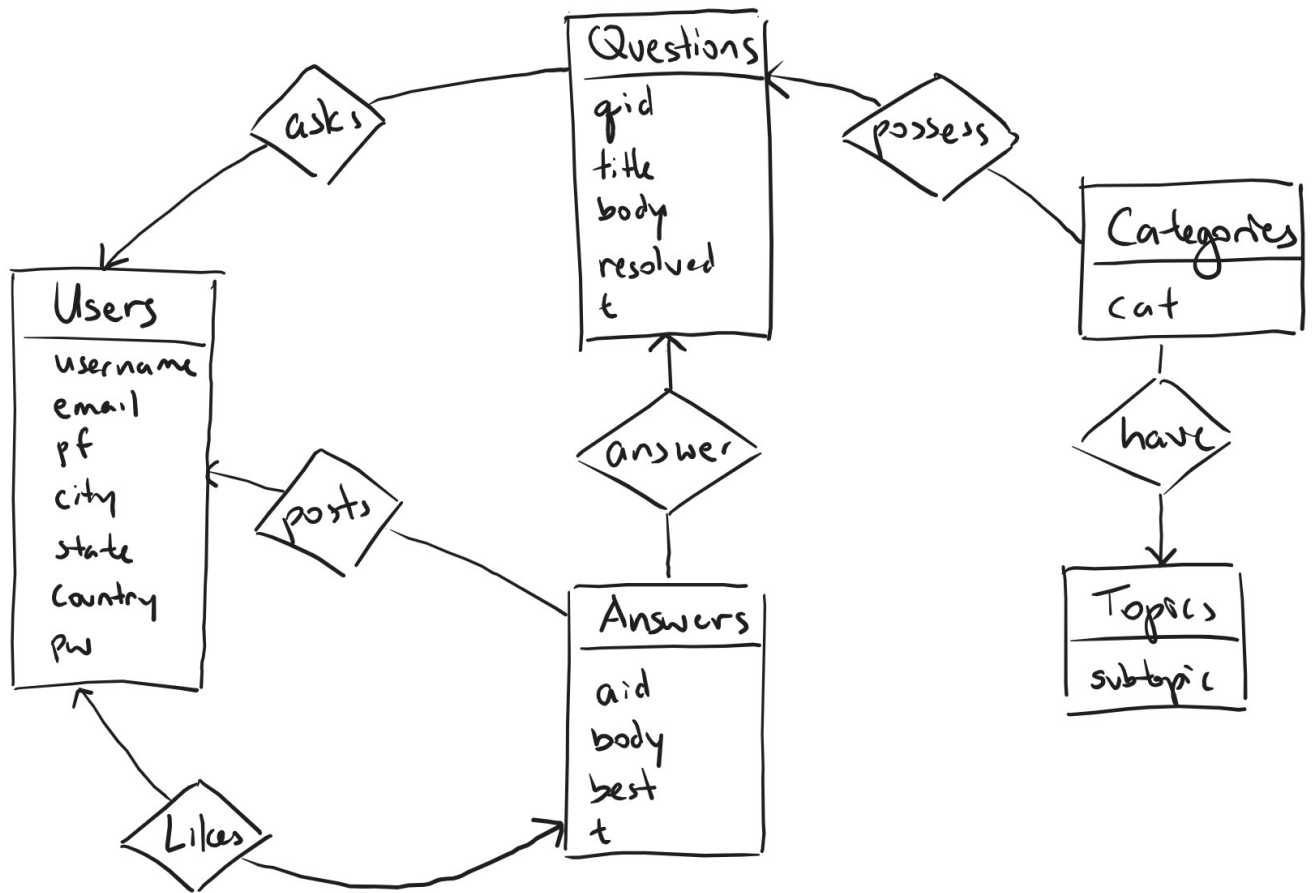
      As users ask questions and post answers to other questions, their tier will increase so everybody can see how *GREAT* of a student they are. Once a student is satisfied with the answer(s) posted in response to their question, they can mark it as resolved, restricting further answers from being posted. A response to a question may be marked as the "best answer" by the poster of the question.

      Searches on the database will take comma-delimited text inputs and return a list of questions containing these inputs – ranked by the number of answers posted in response. Additionally, once clicked on, each student will receive a list of answers to a given question, ranked by the number of likes made by other students. Each question can also be marked with a category, which users can reference for easier searching. Said categories are predefined and structured in a hierarchy of depth 2 that focus on the main fields of study for students of secondary education – all of which is detailed within the Topics table below.

User interactions can be broken down into these following sections:
- Login Page:
    - Students can input a user name and password to log into their account
    - Creates session of a user that can be used to post questions and answers
- Signup page:
    - Visitors can input a user name and password to create an account
        - Includes fields for email, city, state, country, and a short profile description
- Account page:
    - View previously submitted questions
    - View previously submitted answers
    - View/edit profile information: email, city, state, country, and profile description
- Question search:
    - Students can keyword search for questions
    - Pulls up a list of questions containing the keyword on submit, sorted by category, number of answers, and then number of likes
- Answer page:
    - Question at the top of the page and a list of all answers below
        - Space for the user to provide their own answer underneath the question
    - Answers show first on the 'best answer' selection from the poster of the question, then based on the number of likes
        - Button beside each answer to like the answer
    - If user is the one who asked the question:
        - Button to mark the question as 'resolved'
        - Button next to each answer to mark said answer as the 'best answer'

ER Diagram:

Questions
qid
title
body
resolved
t

asks

possess

Categories
cat

Users
username
email
pf
city
state
country
pw

posts

answer

have

Answers
aid
body
best
t

Likes

Topics
subtopic

Schema: (**bold** = primary key, <u>underlined</u> = foreign key)

Users: contains user information	
username	varchar
Email	varchar
pf	text
City	varchar
State	varchar
Country	varchar
pw	varchar

Questions: contains question information	
qid	varchar
title	text
body	text
resolved	integer
t	datetime
username	varchar

username → references Users(username)

Answers: contains answers to questions	
aid	varchar
body	text
best	integer
t	datetime
<u>qid</u>	varchar
<u>username</u>	varchar

qid → references Questions(qid)
username → references Users(username)

Likes: maps who likes what answer	
aid	varchar
username	varchar

(aid + username) comprise the primary key for this table
aid → references Answers(aid)
username → references Users(username)

Categories: maps which questions are tagged under what categories/subcategores	
cat	predefined varchars
qid	varchar

(cat + qid) comprise the primary key for this table
qid → references Questions(qid)

Topics: maps which categories have subcategories	
subcat	predefined varchars
cat	predefined varchars

cat → references Categories(cat)

Sample Data

Users						
username	**pw**	**email**	**city**	**state**	**country**	**pf**
elmo	cookiemonster	seseamest@gmail.edu	Brooklyn	NY	USA	who even a
john	password	johnsmith@nyu.edu	Bronx	NY	USA	just john smithin it up
kora	123	khughes@nyu.edu	Brooklyn	NY	USA	help with hw plz i am ignorant colleg student
michael	12321	michaelwang@nyu.edu	New York	NY	USA	how do you code?
prof. lando	345	profussy@nyu.edu	Springfield	CL	USA	professor tryna catch students plagerizing

Categories	
cat	**qid**
Math	1
Science	2
Math	3
Math	4
Foreign Language	5
History	6
Spanish	6
Economics	7
Chemistry	8
Computer Science	9
Chemistry	9
Literature	10
Oral History	11
Math	13
Math	14

Questions

qid	title	body	resolved	t	username
1	Quic Mafs	What is 1+1?	1	4/12/2022 18:59	kora
2	Human Disection	how do you disect a human?	0	4/12/2022 18:11	kora
3	Hard Mafs	What is the integral of cotan^4(x)?	0	5/12/2022 12:41	kora
4	Middleschool curriculumn: integrals???	A middleschooler of mine turned in a complex integral dissertaion instead of his algebra homework, what do I do?	0	3/12/2022 8:59	prof. lando
5	How to be a polyglot?	I want to know all the languages but I only know english tehe - advice?	0	4/12/2021 10:23	prof. lando
6	What is the the lost history of Spanish colonization	Mas sorces en espanol por favor?	0	4/12/2019 15:48	michael
7	How to maximize capital gains tax for the rich?	What even is capital gains?	0	4/12/2020 12:15	michael
8	How to dissolve a body?	What is the optimal strong acid/base and how do I get rid of the waste wihtout anyone knowing?	0	4/12/2021 17:36	michael
9	Quantum Superposition	Why does quantum computing use superposition when subatomic read/writes are costly?	0	4/12/2021 20:51	john
10	This book changed my life	Haha gottem, you read? NEEEEERD	0	4/12/2019 20:01	john
11	My grandma is a secret spy?	she told me that her ancestors were passed down from royalty to exterminate the Queen? What do I do?	0	4/12/2022 14:13	elmo
13	Math is hard	what is math??? why do we need to take maf	0	4/12/2022 14:13	kora
14	Math	test	0	4/12/2022 14:13	kora

Topics

cat	subcat
English	English
English	Literature
Foreign Language	Afrikans
Foreign Language	Arabic
Foreign Language	Chinese
Foreign Language	Foreign Language
Foreign Language	French
Foreign Language	Russian
Foreign Language	Spanish
History	History
History	Oral History
History	US History
Math	Computer Science
Math	Economics
Math	Math
Science	Biology
Science	Chemistry
Science	Physics
Science	Science

Answers

aid	qid	body	best	t	username
1	1	1+1=2 doy	1	4/13/2022 14:11	kora
2	2	just dont	1	4/16/2022 19:12	elmo
3	3	1+1=2 doy	1	4/19/2022 17:13	elmo
4	1	1+1=21 easy	0	4/18/2022 13:01	elmo
5	4	give them an A+++	1	4/20/2022 11:05	michael
6	7	invest in crypto	1	4/21/2022 12:32	michael
7	10	rude	1	4/22/2022 8:53	michael
8	11	tap into the super secret spy network	1	4/23/2022 10:12	kora
9	1	1+1=10 binary right?	0	4/21/2022 2:11	michael
10	1	Are you actually asking this right now	0	4/14/2022 14:11	prof. lando
11	13	Math is important	0	4/14/2022 14:11	prof. lando

Likes

aid	username
2	elmo
3	elmo
1	john
4	john
1	kora
2	michael
3	michael
5	prof. lando

Testing SQL Queries

1. Create a new user account, together with username, email, password, city, state, country, and profile.

INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('test', 'testPW', 'test@test.edu', 'Toronto', 'Ontario', 'Canada', 'test profile');

Results in this table:

Users						
username	pw	email	city	state	country	pf
elmo	cookiemonster	seseamest@gmail.edu	Brooklyn	NY	USA	who even a
john	password	johnsmith@nyu.edu	Bronx	NY	USA	just john smithin it up
kora	123	khughes@nyu.edu	Brooklyn	NY	USA	help with hw plz i am ignorant colleg student
michael	12321	michaelwang@nyu.edu	New York	NY	USA	how do you code?
prof. lando	345	profussy@nyu.edu	Springfield	CL	USA	professor tryna catch students plagerizing
test	testPW	test@test.edu	Toronto	Ontario	Canada	test profile

- There is a new entry at the bottom that matches the new user account created.

2. Insert a new question into the system, by a particular user and assigned it to a particular topic in the hierarchy.

INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0012', 'Test Title', 'Test Body', 0, '2022-04-17 14:13:00', 'test');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0012');

Results in the tables

Questions					
qid	title	body	resolved	t	username
1	Quic Maths	What is 1+1?	1	4/12/2022 18:59	kora
2	Human Disection	how do you disect a human?	0	4/12/2022 18:11	kora
3	Hard Maths	What is the integral of cotan^4(x)?	0	5/12/2022 12:41	kora

4	Middleschool curriculumn: integrals???	A middleschooler of mine turned in a complex integral dissertaion instead of his algebra homework, what do I do?	0	3/12/2022 8:59	prof. lando
5	How to be a polyglot?	I want to know all the languages but I only know english tehe - advice?	0	4/12/2021 10:23	prof. lando
6	What is the the lost history of Spanish colonization	Mas sorces en espanol por favor?	0	4/12/2019 15:48	michael
7	How to maximize capital gains tax for the rich?	What even is capital gains?	0	4/12/2020 12:15	michael
8	How to dissolve a body?	What is the optimal strong acid/base and how do I get rid of the waste wihtout anyone knowing?	0	4/12/2021 17:36	michael
9	Quantum Superposition	Why does quantum computing use superposition when subatomic read/writes are costly?	0	4/12/2021 20:51	john
10	This book changed my life	Haha gottem, you read? NEEEEERD	0	4/12/2019 20:01	john
11	My grandma is a secret spy?	she told me that her ancestors were passed down from royalty to exterminate the Queen? What do I do?	0	4/12/2022 14:13	elmo
12	Test Title	Test Body	0	4/17/2022 14:13	test
13	Math is hard	what is math??? why do we need to take maf	0	4/12/2022 14:13	kora
14	Math	test	0	4/12/2022 14:13	kora

Categories

cat	qid
Math	1
Science	2
Math	3
Math	4
Foreign Language	5
History	6
Spanish	6
Economics	7

Chemistry	8
Chemistry	9
Computer Science	9
Literature	10
Oral History	11
Math	12
Math	13
Math	14

- There is a new entry in each table, both with qid 12, which show the inserted test case inserted into the questions and categories tables.

3. Write a query that computes for each user their current status (basic, advanced, or expert status) based on their answers and your own chosen criteria for defining the status.

- We are using the total number of questions and answers posted for a user to reveal their status.

```
DROP VIEW IF EXISTS Posts;
create view Posts as
with all_posts as
        ((select username, count(*) as posts
        from Questions
        group by username)
        union
         (select username, count(*) as posts
         from Answers
         group by username))
select username, sum(posts) as num_posts
from all_posts
group by username;
```

Yields this table:

Posts	
username	num_posts
elmo	4
john	2
kora	5
michael	3
prof. lando	2
test	1

PHP Code: (reference 'Full PHP Code' for extra context)

```php
<?php
// GLOBALS
$USER_TIERS = array("basic" => 20, "intermediate" => 50, "advanced" =>
100);


// Queries
$sql = "SELECT * FROM Posts";
$result = $conn->query($sql);


if ($result->num_rows > 0) {
  // output data of each row
  while($row = $result->fetch_assoc()) {
    $num_posts = $row['num_posts'];
    echo "<br> ", $row['username'], " ", $row['num_posts'], " ";
    if($num_posts < $USER_TIERS["basic"]){
      echo "basic";
    } else if($num_posts < $USER_TIERS["intermediate"]){
      echo "intermediate";
    } else {
      echo "expert";
    }
```

```
        echo " </br>";
    }
} else {
    echo "0 results";
}
?>
```

4. For a given question (say identified by an ID), output all answers to the question in chronological order from first to last. Output the answer text and the time and date when it was posted, and whether an answer was selected as best answer.

- For the given question qid=0001:

WITH variable AS (select '0001' AS givenQID)
SELECT *
FROM Answers AS a, variable AS var
WHERE a.qid = var.givenQID
ORDER BY t ASC;

yields

aid	qid	body	best	t	username	givenQID
1	1	1+1=2 doy	1	4/13/2022 14:11	kora	1
10	1	Are you actually asking this right now	0	4/14/2022 14:11	prof. lando	1
4	1	1+1=21 easy	0	4/18/2022 13:01	elmo	1
9	1	1+1=10 binary right?	0	4/21/2022 2:11	michael	1

- Which is every answer for qid=0001 in chronological order.

5. For each topic in the topic hierarchy, output the number of questions posted and total number of answers posted within that topic.

with q as (select cat, count(*) as num_questions
            from Questions join Categories using(qid)
                GROUP BY cat),
    a as (select cat, count(*) as num_answers

from Answers join Questions using(qid) join Categories using(qid)

        group by cat),

    t as (select cat, subcat

    from Topics)

select t.cat, sum(coalesce(q.num_questions, 0)), sum(coalesce(a.num_answers, 0))

from t, q left outer join a on q.cat = a.cat

where t.subcat = q.cat

group by t.cat;

- This SQL query results in this relation, which shows the total number of questions and answers for each category:

cat	num_questions	num_answers
English	1	1
Foreign Language	2	0
History	2	1
Math	8	7
Science	3	2

6. Given a keyword query, output all questions that match the query and that fall into a particular topic, sorted from highest to lowest relevance. (Select and define a suitable form of relevance – you could match the keywords against the query title, the query text, or the query answers, and possibly give different weights to these different fields.)

```
$sql = "CREATE TEMPORARY TABLE keywords(word varchar(24));";
$conn->query($sql);


$stmt = $conn->prepare("INSERT INTO keywords (word) VALUES (?)");
$stmt->bind_param("s", $keyword);


$keywordSearch = array("math", "hard", "is");
```

```php
foreach($keywordSearch as $keyword){
  $stmt->execute();
}



$sql = "
Select aid, c.qid, title, count(aid) as numA, numQ
from answers right join (
  SELECT title, qid, count(qid) as numQ
  FROM Questions JOIN Categories USING(qid), keywords
  where LOCATE(keywords.word, questions.title) > 0
  group by qid
) as c on Answers.qid = c.qid
group by c.qid
order by numQ desc, numA desc;";
$result = $conn->query($sql);

  if ($result->num_rows > 0) {
    // output data of each row
    while($row = $result->fetch_assoc()) {
      echo "qid: ", $row["qid"], "; title: ", $row["title"], "; keyword
matches: ",
      $row["numQ"], "; number of Answers: ", $row["numA"],"<br>";
    }
  } else {
    echo "no results";
  }
?>
```

- This PHP code sorts the results by the number of keyword matches, then the number of answers for each question. The above searches for the keywords "math is hard" gives this result:

qid: 0013; title: Math is hard; keyword matches: 3; number of Answers: 1
qid: 0003; title: Hard Maths; keyword matches: 2; number of Answers: 1
qid: 0006; title: What is the the lost history of Spanish colonization; keyword matches: 2; number of Answers: 0
qid: 0001; title: Quic Maths; keyword matches: 1; number of Answers: 3
qid: 0002; title: Human Disection; keyword matches: 1; number of Answers: 2
qid: 0010; title: This book changed my life; keyword matches: 1; number of Answers: 1
qid: 0011; title: My grandma is a secret spy?; keyword matches: 1; number of Answers: 1
qid: 0008; title: How to dissolve a body?; keyword matches: 1; number of Answers: 0
qid: 0014; title: Math; keyword matches: 1; number of Answers: 0

FULL PHP CODE:

- <u>Run using local host</u> after compiling sql code and <u>attaching to server</u>

```php
<?php
$servername = "localhost";
$username = "root";
$password = "********";

// Create connection
$conn = new mysqli($servername, $username, $password, "sys");

// Check connection
if ($conn->connect_error) {
  die("Connection failed: " . $conn->connect_error);
}
echo "Connected successfully <br>";

//For Question 3
$USER_TIERS = array("basic" => 20, "intermediate" => 50, "advanced" =>
100);

$sql = "SELECT * FROM Posts";
$result = $conn->query($sql);

if ($result->num_rows > 0) {
  // output data of each row
  while($row = $result->fetch_assoc()) {
    $num_posts = $row['num_posts'];
    echo "<br> ", $row['username'], " ", $row['num_posts'], " ";
    if($num_posts < $USER_TIERS["basic"]){
      echo "basic";
    } else if($num_posts < $USER_TIERS["intermediate"]){
      echo "intermediate";
    } else {
      echo "expert";
    }
    echo " </br>";
  }
} else {
  echo "0 results";
```

```php
}

//For Question 6
$sql = "CREATE TEMPORARY TABLE keywords(word varchar(24));";
$conn->query($sql);



$stmt = $conn->prepare("INSERT INTO keywords (word) VALUES (?)");
$stmt->bind_param("s", $keyword);

//Search terms
$keywordSearch = array("math", "hard", "is");

foreach($keywordSearch as $keyword){
  $stmt->execute();
}

$sql = "
Select c.qid, title, count(aid) as numA, numQ
from answers right join (
  SELECT title, qid, count(qid) as numQ
  FROM Questions JOIN Categories USING(qid), keywords
  where LOCATE(keywords.word, questions.title) = 1
  group by qid
) as c on Answers.qid = c.qid
group by c.qid
order by numQ desc, numA desc;";
$result = $conn->query($sql);

  if ($result->num_rows > 0) {
    // output data of each row
    while($row = $result->fetch_assoc()) {
      echo "qid: ", $row["qid"], "; title: ", $row["title"], "; keyword
matches: ",
      $row["numQ"], "; number of Answers: ", $row["numA"],"<br>";
    }
  } else {
    echo "no results";
  }
?>
```

SQL CODE:

```
-- Drop any if already present
drop table if exists Categories CASCADE;
drop table if exists Topics CASCADE;
drop table if exists Likes CASCADE;
drop table if exists Answers CASCADE;
drop table if exists Questions CASCADE;
drop table if exists Users CASCADE;

-- Create the Tables
 -- Users
Create table Users(
    username varchar(24) primary key unique,
    pw varchar(64) not null,
    email varchar(48),
    city varchar(24),
    state varchar(24),
    country varchar(24),
    pf text
    /*tier varchar(24) not null,
    constraint chk_tier check (tier IN('Basic', 'Intermediate', 'Advanced', 'Expert'))*/
);

 -- Questions
Create table Questions(
    qid varchar(4) primary key,
    title text not null,
    body text not null,
    resolved integer,
    t datetime,  -- YYYY-MM-DD HH:MM:SS.SSS
    username varchar(24),

    constraint chk_resolved check (resolved IN(0, 1)),

    foreign key (username) references Users(username)
);
```

```
 -- Answers
Create table Answers(
    aid varchar(4) primary key,
    qid varchar(4) not null,
    body text not null,
    best integer,
    t datetime,  -- YYYY-MM-DD HH:MM:SS.SSS
    username varchar(24),

    constraint chk_best check (best IN(0, 1)),

    foreign key(username) references Users(username),
    foreign key(qid) references Questions(qid)
);

 -- Likes
Create table Likes(
    aid varchar(4) not null,
    username varchar(24),

    primary key(aid, username),
    foreign key(aid) references Answers(aid),
    foreign key(username) references Users(username)
);

 -- Categories
Create table Categories(
    cat varchar(64) not null,
    qid varchar(4) not null,

    -- constraint cat_chk check (cat IN(select cat from topics union select subcat as cat from
topics)),
    primary key(cat, qid),
    foreign key(qid) references Questions(qid)
);
-- Topics: defines category heierarchy
Create table Topics(
        cat varchar(64) not null,
    subcat varchar(64) not null,
```

```
    primary key (cat, subcat)
);
insert into Topics(cat, subcat) values('Science', 'Science');
insert into Topics(cat, subcat) values('Science', 'Chemistry');
insert into Topics(cat, subcat) values('Science', 'Biology');
insert into Topics(cat, subcat) values('Science', 'Physics');

insert into Topics(cat, subcat) values('Math', 'Math');
insert into Topics(cat, subcat) values('Math', 'Computer Science');
insert into Topics(cat, subcat) values('Math', 'Economics');

insert into Topics(cat, subcat) values('English', 'English');
insert into Topics(cat, subcat) values('English', 'Literature');

insert into Topics(cat, subcat) values('Foreign Language', 'Foreign Language');
insert into Topics(cat, subcat) values('Foreign Language', 'Spanish');
insert into Topics(cat, subcat) values('Foreign Language', 'Chinese');
insert into Topics(cat, subcat) values('Foreign Language', 'French');
insert into Topics(cat, subcat) values('Foreign Language', 'Arabic');
insert into Topics(cat, subcat) values('Foreign Language', 'Russian');
insert into Topics(cat, subcat) values('Foreign Language', 'Afrikans');

insert into Topics(cat, subcat) values('History', 'History');
insert into Topics(cat, subcat) values('History', 'US History');
insert into Topics(cat, subcat) values('History', 'Oral History');


 -- Part 1 Queries
 -- (1) (+part d's extra sample data)
INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('kora', '123',
'khughes@nyu.edu', 'Brooklyn', 'NY', 'USA', 'help with hw plz i am ignorant colleg student');
INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('prof. lando', '345',
'profussy@nyu.edu', 'Springfield', 'CL', 'USA', 'professor tryna catch students plagerizing');
INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('michael', '12321',
'michaelwang@nyu.edu', 'New York', 'NY', 'USA', 'how do you code?');
INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('john', 'password',
'johnsmith@nyu.edu', 'Bronx', 'NY', 'USA', 'just john smithin it up');
INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('elmo',
'cookiemonster', 'seseamest@gmail.edu', 'Brooklyn', 'NY', 'USA', 'who even a');
```

INSERT INTO Users(username, pw, email, city, state, country, pf) VALUES ('test', 'testPW', 'test@test.edu', 'Toronto', 'Ontario', 'Canada', 'test profile');

-- (2) (+part d's extra sample data)
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0001', 'Quic Maths', 'What is 1+1?', 1, '2022-04-12 18:59:00', 'kora');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0002', 'Human Disection', 'how do you disect a human?', 0, '2022-04-12 18:11:00', 'kora');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0003', 'Hard Maths', 'What is the integral of cotan^4(x)?', 0, '2022-05-12 12:41:00', 'kora');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0004', 'Middleschool curriculumn: integrals???', 'A middleschooler of mine turned in a complex integral dissertaion instead of his algebra homework, what do I do?', 0, '2022-03-12 08:59:00', 'prof. lando');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0005', 'How to be a polyglot?', 'I want to know all the languages but I only know english tehe - advice?', 0, '2021-04-12 10:23:00', 'prof. lando');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0006', 'What is the the lost history of Spanish colonization', 'Mas sorces en espanol por favor?', 0, '2019-04-12 15:48:00', 'michael');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0007', 'How to maximize capital gains tax for the rich?', 'What even is capital gains?', 0, '2020-04-12 12:15:00', 'michael');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0008', 'How to dissolve a body?', 'What is the optimal strong acid/base and how do I get rid of the waste wihtout anyone knowing?', 0, '2021-04-12 17:36:00', 'michael');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0009', 'Quantum Superposition', 'Why does quantum computing use superposition when subatomic read/writes are costly?', 0, '2021-04-12 20:51:00', 'john');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0010', 'This book changed my life', 'Haha gottem, you read? NEEEEERD', 0, '2019-04-12 20:01:00', 'john');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0011', 'My grandma is a secret spy?', 'she told me that her ancestors were passed down from royalty to exterminate the Queen? What do I do?', 0, '2022-04-12 14:13:00', 'elmo');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0013', 'Math is hard', 'what is math??? why do we need to take maf', 0, '2022-04-12 14:13:00', 'kora');
INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0014', 'Math', 'test', 0, '2022-04-12 14:13:00', 'kora');

INSERT INTO Categories(cat, qid) VALUES ('Math', '0001');
INSERT INTO Categories(cat, qid) VALUES ('Science', '0002');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0003');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0004');
INSERT INTO Categories(cat, qid) VALUES ('Foreign Language', '0005');
INSERT INTO Categories(cat, qid) VALUES ('History', '0006');
INSERT INTO Categories(cat, qid) VALUES ('Spanish', '0006');
INSERT INTO Categories(cat, qid) VALUES ('Economics', '0007');
INSERT INTO Categories(cat, qid) VALUES ('Chemistry', '0008');
INSERT INTO Categories(cat, qid) VALUES ('Computer Science', '0009');
INSERT INTO Categories(cat, qid) VALUES ('Chemistry', '0009');
INSERT INTO Categories(cat, qid) VALUES ('Literature', '0010');
INSERT INTO Categories(cat, qid) VALUES ('Oral History', '0011');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0013');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0014');

INSERT INTO Questions(qid, title, body, resolved, t, username) VALUES ('0012', 'Test Title', 'Test Body', 0, '2022-04-17 14:13:00', 'test');
INSERT INTO Categories(cat, qid) VALUES ('Math', '0012');

INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0001', '0001', '1+1=2 doy', 1, '2022-04-13 14:11:19', 'kora');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0002', '0002', 'just dont', 1, '2022-04-16 19:12:13', 'elmo');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0003', '0003', 'not worth the calculation', 1, '2022-04-19 17:13:51', 'elmo');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0004', '0001', '1+1=21 easy', 0, '2022-04-18 13:01:12', 'elmo');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0005', '0004', 'give them an A+++', 1, '2022-04-20 11:05:24', 'michael');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0006', '0007', 'invest in crypto', 1, '2022-04-21 12:32:14', 'michael');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0007', '0010', 'rude', 1, '2022-04-22 08:53:42', 'michael');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0008', '0011', 'tap into the super secret spy network', 1, '2022-04-23 10:12:12', 'kora');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0009', '0001', '1+1=10 binary right?', 0, '2022-04-21 02:11:19', 'michael');

INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0010', '0002', 'Are you actually asking this right now?', 0, '2022-04-14 14:11:19', 'prof. lando');
INSERT INTO Answers(aid, qid, body, best, t, username) VALUES ('0011', '0013', 'Math is important', 0, '2022-04-14 14:11:19', 'prof. lando');

INSERT INTO Likes(aid, username) VALUES ('0001', 'kora');
INSERT INTO Likes(aid, username) VALUES ('0002', 'michael');
INSERT INTO Likes(aid, username) VALUES ('0003', 'michael');
INSERT INTO Likes(aid, username) VALUES ('0004', 'john');
INSERT INTO Likes(aid, username) VALUES ('0005', 'prof. lando');
INSERT INTO Likes(aid, username) VALUES ('0001', 'john');
INSERT INTO Likes(aid, username) VALUES ('0002', 'elmo');
INSERT INTO Likes(aid, username) VALUES ('0003', 'elmo');

-- (3) Note: this view is just the basis of the query --> php code with the logic below to output the right tiers
 /* Logic: #posts = p
    Beginner => p<20
    Intermediate => 20<p<50
    Advanced => 50<p<200
    Expert => 200<p
*/
DROP VIEW IF EXISTS Posts;
create view Posts as
with all_posts as
        ((select username, count(*) as posts
        from Questions
        group by username)
    union
    (select username, count(*) as posts
        from Answers
        group by username))
select username, sum(posts) as num_posts
from all_posts
group by username;

select * -- for testing

```
from Posts;

-- (4)
with variable as (select '0001' as givenQID)
SELECT a.body, a.t, best
FROM Answers as a, variable as var
WHERE a.qid = var.givenQID
ORDER BY t ASC;


-- (5)
with q as (select cat, count(*) as num_questions
             from Questions join Categories using(qid)
                 GROUP BY cat),
    a as (select cat, count(*) as num_answers
               from Answers join Questions using(qid) join Categories using(qid)
               group by cat),
        t as (select cat, subcat
        from Topics)
select t.cat, sum(coalesce(q.num_questions, 0)), sum(coalesce(a.num_answers, 0))
from t, q left outer join a on q.cat = a.cat
where t.subcat = q.cat
group by t.cat;



 -- (6)



-- create temporary table keywords(
--    word varchar(24)
-- );
-- insert into keywords(word) values ("math");
-- insert into keywords(word) values ("is");
-- insert into keywords(word) values ("hard");

Select c.qid, title, count(aid) as numA, numQ
from answers right join (
        SELECT title, qid, count(qid) as numQ
        FROM Questions JOIN Categories USING(qid), keywords
        where LOCATE(keywords.word, questions.title) = 1
        group by qid
```

```
) as c on Answers.qid = c.qid
group by c.qid
order by numQ desc, numA desc;



-- Extra Queries:

 -- List of Answers to a given question by likes
 -- Note: 1 like ranked the same as 0 likes ==> we assume the creator of the answer like it
with variable as (select '0001' as givenQID)
SELECT a.aid, count(*) as num_likes, t as post_time
FROM Answers as a left join Likes as l on a.aid = l.aid, variable as var
WHERE a.qid = var.givenQID
group by a.aid
ORDER BY count(*) desc, t asc;
```