

Project 2#

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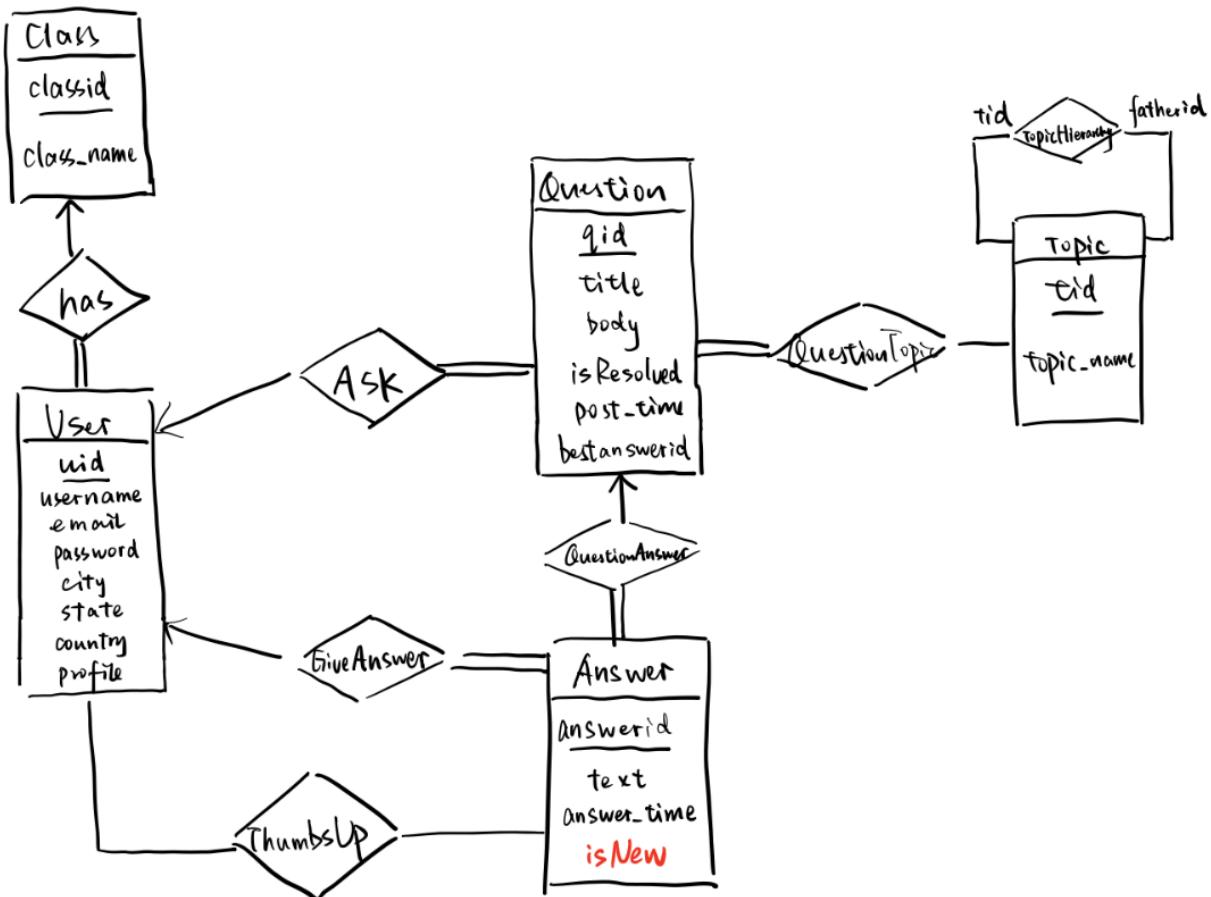
I. Introduction

In this project, we design a system for question answering service. This report is divided into four parts, introduction, design (E-R diagram, relational schema), user instructions (the general layout of the webpage we design and the supported functions), and the implementation of SQL query that help to achieve those functions.

II. Design

This part includes E-R diagram, important assumptions, relational schema, and the screenshots of each table in the database system MySQL. Compared to project 1, the majority of the E-R diagram remains unchanged. We only add a new attribute “isNew” in the Answer table since we need to satisfy the new need of showing the notification of the new answers.

1. E-R Diagram:



2. Assumption:

- (1) Every question has one best answer, so we use bestanswerid in Question Table to determine which is the best answer to that question. If the questioner does not select one answer as the best, this field will be filled by NULL.
- (2) Every class belongs to a certain class among Basic, Advanced, and Expert. The default value is Basic for new users.
- (3) Each answer will be assigned an answerid, even the same user answers the same content for the same question.
- (4) Every question has a topic and a question can belong to many topics. If a question belongs to a lower-level topic, then it will also belong to its father topic. For example, if a user selects mysql as the question topic, and mysql's father topic and grandpa topic is database and CS. We will automatically record these relationships in the QuestionTopic Table.

3. Relational Schema:

User(uid, username, email, password, city, state, country, profile, classid)

User.classid is a foreign key referencing to Class.classid

Class(classid, class_name)

Question(qid, title, body, post_time, isResolved, bestanswerid)

Question.bestanswerid is a foreign key referencing to Answer.bestanswerid

Ask(qid, uid)

Ask.qid is a foreign key referencing to Question.qid

Ask.uid is a foreign key referencing to User.uid

Topic(tid, topic_name)

QuestionTopic(qid, tid)

QuestionTopic.qid is a foreign key referencing to Question.qid

QuestionTopic.tid is a foreign key referencing to Topic.tid

TopicHierarchy(tid, fatherid)

TopicHierarchy.tid is a foreign key referencing to Topic.tid

TopicHierarchy.fatherid is a foreign key referencing to Topic.tid

Answer(answerid, text, answer_time, **isNew**)

GiveAnswer(uid, answerid)

GiveAnswer.uid is a foreign key referencing to User.uid

GiveAnswer.answerid is a foreign key referencing to Answer.answerid

QuestionAnswer(qid, answerid)

QuestionAnswer.qid is a foreign key referencing to Question.qid

QuestionAnswer.answerid is a foreign key referencing to Answer.answerid

Thumbsup(answerid, uid)

Thumbsup.answerid is a foreign key referencing to Answer.answerid

Thumbsup.uid is a foreign key referencing to User.uid

4. Screenshots of Tables:

a. User Table:

uid	username	classid	email	profile	password	city	state	country
1	Ueno Shino	1	ueshin1@outlook.com	znJg5J9Ljp	wln9hjoGgu	Nara	Japan	Japan
2	Ying Tin Wing	1	yingtinwing1211@outlook.com	9s9wJnvDD	EG84ii923N	Chengdu	China	China
3	Yuen Wing Sze	1	yuews@gmail.com	luhsBFOl4a	vO0bzDQ6yl	Oxford	United Kingdom	United Kingdom
4	Leroy Gibson	1	gibson99@icloud.com	6fyKp8crMO	72xdfwLYp	Zhongshan	China	China
5	Ding Zhennan	1	zhennand@yahoo.com	hQKJnNHtyp	Eh3tnaCd3M	Chicago	Illinois	United States
6	Miyazaki Momoka	1	momoka7@icloud.com	DqQUZQXkLq	XqI4vsCo3Q	Brooklyn	New York	United States
7	He Zhiyuan	1	zhiyh@outlook.com	QVz5V02u70	5MlvFwOvmKp	London	United Kingdom	United Kingdom
8	Zhao Zhennan	1	zhao2@icloud.com	Bu39KUxy5T	uj5DMXaruA	Leicester	United Kingdom	United Kingdom
9	Murata Kaito	1	murata422@yahoo.com	OE8Uct4Fmx	FnwQDcsxLn	Tokyo	Japan	Japan
10	Tong Ming Sze	1	tong6@gmail.com	PDY94QuQ1S	nDcqvWW8w1	Liverpool	United Kingdom	United Kingdom

b. Answer Table:

answerid	text	answer_time
1	It should be: I like the person who is nice to me.	2022-03-03 23:51:27
2	I like the person who is nice to me. who substitutes for subject nouns/pronouns (he, she, we, they)	2022-03-04 23:52:36
3	You don't have full joins in MySQL, but you can sure emulate them. For a code sample transcribed from this Stack Overflow answer	2022-04-01 23:54:39
4	mysql is bad. Try to use PostgreSQL	2022-03-31 23:58:23
5	Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm that repeatedly steps through	2022-04-11 23:59:01
6	Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the results together. This algorithm is very efficient, having a time complexity of O(n log n).	2022-03-10 23:59:42
7	Cost of Investment Net Return on Investment ×100% Cost of Investment Net Return on Investment ×100% N	2022-04-17 00:00:44
8	try to look at this website: https://www.geeksforgeeks.org/bubble-sort/	2022-04-13 00:01:58

c. Question Table:

qid	title	body	post_time	isResolved	bestanswerid
1	How to use relative clause?	I like the person. The person was nice to me. How to conn	2022-03-02 23:39:01	1	2
2	What English books do you recommend?	I am a chinese speaker, I want to improve my english. Wh	2022-02-15 23:40:08	0	(Null)
3	How can I do a full outer join in MySQL?	I want to do a full outer join in MySQL. Is this possible? Is	2022-01-11 23:41:38	1	3
4	What are the various types of relationships in Database? Define them.	help!	2022-04-02 23:43:12	0	(Null)
5	What is bubble sort?	Can anyone provide some examples?	2022-04-04 23:46:08	1	5
6	What is merge sort?	Hi, examples will be appreciated.	2022-03-09 23:47:02	1	6
7	How to calculate Return on Investment (ROI)?	Return on investment (ROI) is an approximate measure of	2022-02-01 23:49:10	1	7

d. Class Table:

classid	class_name
1	Basic
2	Advanced
3	Expert

e. TopicHierarchy Table:

tid	fatherid
3	1
7	2
8	2
6	5
9	7

f. GiveAnswer Table:

uid	answerid
2	1
1	2
7	3
4	4
4	5
1	6
1	7
1	8

g. QuestionAnswer Table:

qid	answerid
1	1
1	2
3	3
3	4
5	5
6	6
7	7
5	8

h. Ask Table:

qid	uid
2	2
6	2
1	3
4	7
3	8
5	9
7	10

i. Topic Table:

tid	topic_name
1	English
2	Computer Science
3	Grammar
4	Finance
5	Mathematics
6	Algebra
7	Database
8	Algorithm
9	MySQL

j. ThumbsUp Table:		k. QuestionTopic Table:	
answerid	uid	qid	tid
3	1	2	1
3	2	1	3
6	2	7	4
8	2	4	7
1	3	5	8
2	3	6	8
1	4	3	9
2	4	1	1
3	4	4	2
7	4	5	2
1	5	6	2
2	5	3	7
3	5	3	2
7	5		
5	6		
2	7		
2	8		
8	9		

III. User Instructions

A general summary of the functions we provide: register, sign-in, sign-out, changing profile after register, seeing the expert level of the current user, asking a new question, posting a new answer, deleting an answer, editing an answer, selecting an answer as the best, thumbing up an answer, seeing recent activities, checking if there is anything new to the question the questioner posted, keyword search by relevance, searching with different options, having different topic hierarchy, browsing by topics, bookmarking a question, guarding against SQL injection and cross-site scripting.

1. Setup:

Wampserver 3.2.6, Navicat Premium 16

2. Functions:

(1) Login:

User will first be directed to the login page where they have to enter the username and password to be able to see the contents of questions and answers.

Welcome to HiQuest

Username

Password

Don't have an account? [Sign up now.](#)

Welcome to HiQuest

Username



Please enter your username.

Password



Please enter your password.

Don't have an account? [Sign up now.](#)

(2) Register:

If the user does not have an account, he or she may click “Sign up now” to open an account, and the user will be redirected to the sign-up page.

Sign Up

Please fill this form to create an account.

Username

Password

Confirm Password

E-mail

City

(If your country does not have a state, just enter country name.)

State

Country

Profile

Already have an account? [Login here.](#)

After entering the information, and clicking the “Submit” button, a new account will be registered. Note the username must be unique and the information must be non-empty. Otherwise, there would be error message (see following).

Username



This username is already taken.

Password



Please enter a password.

Confirm Password



Please confirm password.

(3) Navigation:

After logging in, the user will be directed to the main page, where there is a welcome message above. In the second row below, user can check their membership level, search questions, ask questions, edit profile and sign out. In the third row, user can click the topics below and browse the questions under these topics. The “Question” and “Answer” below allow user to see all their questions they asked and their answers they published. The two tables in the center are the recent activities. The first table is the most five recent questions and the second is the most five recent answers.

Hi, us123. Welcome to HiQuest.

The screenshot shows the HiQuest homepage. At the top, there's a navigation bar with 'HiQuest', 'Home', and 'Level' links. Below that is a search bar with 'Search...' and three radio buttons for 'General Search', 'Question Search', and 'Answer Search'. To the right are 'Ask' (green), 'Change profile' (yellow), and 'Sign Out' (red) buttons. Under the search bar, there's a horizontal menu with 'English', 'Computer Science', 'Grammar', 'Finance', 'Mathematics', 'Algebra', 'Database', 'Algorithm', and 'MySQL'. Below the menu are two tabs: 'Questions' and 'Answers'. A table follows, showing recent questions posted by 'us123'. Another table shows recent answers provided by 'us123'.

Question	Description	Post Time	New Answers
How to write php?	see above	2022-05-14 20:03:36	0

Question	Answer	Answer Time
How to calculate Return on Investment (ROI)?	Cost of Investment Net Return on Investment ? >100% ? Cost of Investment Net Return on Investment ? >100% ? Net return on investment/cost of investment *100%	2022-04-17 00:00:44
What is bubble sort?	try to look at this website: https://www.geeksforgeeks.org/bubble-sort/	2022-04-13 00:01:58
What is merge sort?	Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the two sorted halves. The merge() function is used for merging two halves. The merge(arr, l, m, r) is a key process that assumes that arr[l..m] and arr[m+1..r] are sorted and merges the two sorted sub-arrays into one. See the following C implementation for details.	2022-03-10 23:59:42
How to use relative clause?	I like the person who is nice to me. who substitutes for subject nouns/pronouns (he, she, we, they)	2022-03-04 23:52:36

(4) Level:

The level indicates the user class based on how many likes they received. For simplicity, if a user received 10 likes or more, he/she will be classified as an expert user. If the user received from 2 likes to 9 likes, he/she will be classified as advanced. Others including new users will be classified as a basic level user.

You have 7 likes! Great! You are an advanced user!

(5) Change Profile:

User can still change their profile information after they have signed up by clicking the button at the upper-right corner. They will be redirected to a new page where they can reset their personal information, such as e-mail, city, country, and profile. Meanwhile, there will be an update in the database.

Edit Profile

Please fill out this form to change your profile.

Email

City

Country

Profile

Submit **Cancel**

(6) Sign out:

The signout button at the upper right corner allows user to log out and their user session will be closed. They will be redirected to the sign-in page.

(7) Search:

User can search by keyword what question or answers they are looking for. General search means the result will be based on both questions and answers sorted by relevance. Question and answer search is only based on question or answer respectively. Answers are listed based on relevance.

Questions

There are 2 results!

[**What is bubble sort?**](#)

2022-04-04 23:46:08

Can anyone provide some examples on bubble sort?

3.0759127140045166

[**What is merge sort?**](#)

2022-03-09 23:47:02

Hi, examples will be appreciated.

1.5438438653945923

(8) Ask:

When clicking Ask, the user will be directed to a page to fill question title, description, and the topic. If any of these are not filled, an error message will pop up. After clicking submit, the question will be posted.

Question

Question title

Question Description

Topic

 Select Topic ▾

Submit

[Cancel](#)

(9) Recent Question:

The user can click the questions button at the top and see all their questions they have posted.

Question	Description	Post Time	New Answers
Definition of a group in algebra?	Definition of a group in algebra?	2022-05-15 10:58:49	0
What is the derivative of x^2?	I am learning calculus.	2022-05-15 10:57:01	0
How to write php?	see above	2022-05-14 20:03:36	0

(10) Recent Answers:

The user can click the answers button at the top and see all their questions they have posted.

Question	Answer	Answer Time
How to calculate Return on Investment (ROI)?	Cost of Investment Net Return on Investment ? ×100% ? Cost of Investment Net Return on Investment ? ×100% ? Net return on investment/cost of investment *100%	2022-04-17 00:00:44
What is bubble sort?	try to look at this website: https://www.geeksforgeeks.org/bubble-sort/	2022-04-13 00:01:58
What is merge sort?	Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the two sorted halves. The merge() function is used for merging two halves. The merge(arr, l, m, r) is a key process that assumes that arr[l..m] and arr[m+1..r] are sorted and merges the two sorted sub-arrays into one. See the following C implementation for details.	2022-03-10 23:59:42
How to use relative clause?	Like the person who is nice to me, who substitutes for subject nouns/pronouns (he, she, we, they)	2022-03-04 23:52:36

(11) Browsing Topics:

Topics are listed so that user may choose the topic they are interested in to browse the questions. After choosing the topic and if the topic has any subtopics, user can click the green button and browse the subtopics. Questions in the subtopics are also in the father topics.

Questions

[Database](#) [Algorithm](#)

[How to survive in NYU CS program?](#)
Final week is too busy.
2022-05-14 23:55:15

[How to write php?](#)
see above
2022-05-14 20:03:36

[What is bubble sort?](#)
Can anyone provide some examples on bubble sort?
2022-04-04 23:46:08

[What are the various types of relationships in Database? Define them.](#)
help!
2022-04-02 23:43:12

Questions

[MySQL](#)

[How to write.php?](#)
see above
2022-05-14 20:03:36

[What are the various types of relationships in Database? Define them](#)
help!
2022-04-02 23:43:12

[How can I do a full outer join in MySQL?](#)
I want to do a full outer join in MySQL. Is this possible? Is a full outer join supported by MySQL?
2022-01-11 23:41:38

(12) Recent activities and new answer notification:

At the home page, users can see their recent activities on their recently posted questions and answers. For the questions they have posted, if some other user gives an answer to it, there will be update on the newAnswers column to show how many new answers have been added to their posted questions. For each table, the rows will not exceed 5.

Hi, us123. Welcome to HiQuest.

The screenshot shows the HiQuest home page with a search bar and navigation links for Home, Level, English, Computer Science, Grammar, Finance, Mathematics, Algebra, Database, Algorithm, and MySQL. Below the search bar, there are tabs for Questions and Answers. A table displays recent posts:

Question	Description	Post Time	New Answers
qwd	qwd	2022-05-15 11:42:18	0
Is there any software to help check grammar? just to improve English		2022-05-15 11:41:44	0
How to calculate Return on Investment (ROI)?			
What is merge sort?	Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the two sorted halves. The merge() function is used for merging two halves. The merge(arr, l, m, r) is a key process that assumes that arr[l..m] and arr[m+1..r] are sorted and merges the two sorted sub-arrays into one. See the following C implementation for details.		
How to use relative clause?	I like the person who is nice to me, who substitutes for subject nouns/pronouns (he, she, we, they)		

Below the table, there is a section for answers:

Question	Answer	Answer Time
How to calculate Return on Investment (ROI)?	Cost of Investment Net Return on Investment ? ◆100% ? Cost of Investment Net Return on Investment ? ◆100% ? Net return on investment/cost of investment *100%	2022-04-17 00:00:44
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How to use relative clause?	I like the person who is nice to me, who substitutes for subject nouns/pronouns (he, she, we, they)	2022-03-04 23:52:36

Hi, us123. Welcome to HiQuest.

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Question	Description	Post Time	New Answers
qwd	qwd	2022-05-15 11:42:18	0
Is there any software to help check grammar? just to improve English		2022-05-15 11:41:44	2
How to calculate Return on Investment (ROI)?			
What is merge sort?	Merge Sort is a Divide and Conquer algorithm. It divides the input array into two halves, calls itself for the two halves, and then merges the two sorted halves. The merge() function is used for merging two halves. The merge(arr, l, m, r) is a key process that assumes that arr[l..m] and arr[m+1..r] are sorted and merges the two sorted sub-arrays into one. See the following C implementation for details.		
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How to use relative clause?	I like the person who is nice to me, who substitutes for subject nouns/pronouns (he, she, we, they)	2022-03-04 23:52:36

(13) Answer:

After the user clicks on a question, they will be redirected to the answer page. Different users may see different layout based on whether they are the questioners or answerers. In our design, everyone can rate answers, but only the answerer can set a question to be resolved and set a best answer. And only the person who answered that question can edit or delete it.

a. Set a question to be Resolved

At the top section, it will show whether this question has been resolved or not, and show the question title, description, and posting time. If the questioner enters the question page, they can set the question to resolved state if it is not resolved, while general users will not see that button.

Question Page

The screenshot shows a teal-colored question page. At the top, there is a button labeled "Set question as Resolved". Below it, a message says "This question has not been resolved." The question title is "Is there any software to help check grammar?". The posting time is "2022-05-15 11:41:44". The page ends with the text "just to improve English".

(the question is not resolved)

Question Page

The screenshot shows a teal-colored question page. At the top, there is a button labeled "Set question as Resolved". Below it, a message says "This question has been resolved." The question title is "Is there any software to help check grammar?". The posting time is "2022-05-15 11:41:44". The page ends with the text "just to improve English".

(the question is resolved)

Question Page

This question has been resolved.

Is there any software to help check grammar?

2022-05-15 11:41:44

just to improve English

(general users will not see the resolved button)

b. Like an answer

Below every answer, there will be a like button. Beside it, how many likes till now this answer has gained will be shown. If users click the like button, there will be a real-time update on the number of likes beside. Users can like different answers in the same questions but they can only give 1 like per answer, which means if they have already clicked the button, there will be no change to the number of likes in total to that question.

Question Page

This question has not been resolved.

How can I do a full outer join in MySQL?

2022-01-11 23:41:38

I want to do a full outer join in MySQL. Is this possible? Is a full outer join supported by MySQL?

You don't have full joins in MySQL, but you can sure emulate them. For a code sample transcribed from this Stack Overflow question you have: With two tables t1, t2: SELE

He Zhiyuan

2022-04-01 23:54:39

Like 3 likes

mysql is bad. Try to use PostgreSQL.

Leroy Gibson

2022-03-31 23:58:23

Like 0 likes

Question Page

This question has not been resolved.

How can I do a full outer join in MySQL?

2022-01-11 23:41:38

I want to do a full outer join in MySQL. Is this possible? Is a full outer join supported by MySQL?

You don't have full joins in MySQL, but you can sure emulate them. For a code sample transcribed from this Stack Overflow question you have: With two tables t1, t2: SELE

He Zhiyuan

2022-04-01 23:54:39

Like 4 likes

mysql is bad. Try to use PostgreSQL.

Leroy Gibson

2022-03-31 23:58:23

Like 1 likes

c. Select an answer as the best

Only the questioner has the option to only select one answer as the best answer. For them, there will be an isBest button at the end of each answer while general users will not see that button. Only one answer can be selected as the best. After clicking, there will be a real-time update on which answer is the best at the top of the page. If they want to change the best answer, they can just click on the isBest button beside any other answers and there will be a real-time update at the top part.

Question Page

Set question as Resolved

This question has not been resolved.
Is there any software to help check grammar?

2022-05-15 11:41:44
just to improve English

Following is the best answer:
Check this bro: <https://launchberg.com/5-best-grammar-checkers/>
Ying Tin Wing
2022-05-15 12:14:47

Check this bro: <https://launchberg.com/5-best-grammar-checkers/>
Ying Tin Wing
2022-05-15 12:14:47

Like isBest 1 likes

I will Grammarly. It is free.
fw2155
2022-05-15 11:55:10

Like isBest 0 likes

Question Page

Set question as Resolved

This question has not been resolved.
Is there any software to help check grammar?

2022-05-15 11:41:44
just to improve English

Following is the best answer:
I will Grammarly. It is free.
fw2155
2022-05-15 11:55:10

Check this bro: <https://launchberg.com/5-best-grammar-checkers/>
Ying Tin Wing
2022-05-15 12:14:47

Like isBest 1 likes

I will Grammarly. It is free.
fw2155
2022-05-15 11:55:10

Like isBest 1 likes

d. Edit an answer

Only the answerer can edit the answer he has answered just by clicking on the edit button. They will be redirect to an edit page where they can submit their new answers, and then they will be redirected to the answer page where the new answer will be shown.

Question Page

This question has not been resolved.
What is bubble sort?

2022-04-04 23:46:08
Can anyone provide some examples on bubble sort?

try to look at this website: <https://www.geekforgeeks.org/bubble-sort/>

us123
2022-04-13 00:01:58

Edit Delete Like 2 likes

Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm that repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. The pass through the list is repeated until the list is sorted.

Leroy Gibson
2022-04-11 23:59:01

Like 1 likes

(before editing)

Edit Answer

Please reanswer the question.

Submit Cancel

(editing page)

Question Page

This question has not been resolved.

What is bubble sort?

2022-04-04 23:46:08

Can anyone provide some examples on bubble sort?

qwq

us123

2022-05-15 12:47:25

[Edit](#) [Delete](#) [Like](#) 2 likes

Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm that repeatedly steps through

Leroy Gibson

2022-04-11 23:59:01

[Like](#) 1 likes

(real-time update on page)

e. Delete an answer

Only the answerer has the permission to delete his own answer. When he clicks the delete button, the answer will directly disappear at the answer page. We can see that only one answer is left after clicking.

Question Page

This question has not been resolved.

What is bubble sort?

2022-04-04 23:46:08

Can anyone provide some examples on bubble sort?

qwq

us123

2022-05-15 12:47:25

[Edit](#) [Delete](#) [Like](#) 2 likes

Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm that repeatedly steps through

Leroy Gibson

2022-04-11 23:59:01

[Like](#) 1 likes

Question Page

This question has not been resolved.

What is bubble sort?

2022-04-04 23:46:08

Can anyone provide some examples on bubble sort?

Bubble sort, sometimes referred to as sinking sort, is a simple sorting algorithm tha

Leroy Gibson

2022-04-11 23:59:01

[Like](#) 1 likes

f. Add an answer

At the bottom of each question page, there is a add-an-answer box. After entering the text and clicking the submit bottom, there will be an update on the question page.

Question Page

This question has not been resolved.

What are the various types of relationships in Database? Define them.

2022-04-02 23:43:12

help!

Add an answer

[Submit](#)

[Cancel](#)

Question Page

This question has not been resolved.

What are the various types of relationships in Database? Define them.

2022-04-02 23:43:12

help!

There are three types of relationships between the data you are likely to encounter at this stage in the design: one-to-one, one-to-many, and many-to-many.

fw2155

2022-05-15 13:25:50

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0 likes

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V. Implementation

In this part, we will list the major SQL query we use that helps achieve the above functions. We use MySQL 8.0.27 and PHP 7.4.26 on this project.

1. Maintain user state

Check if the user is logged in. If not, redirect to Login Page, and also set `$_SESSION['uid']` to be the current logged in user id so that we will know who has logged in and display relevant information.

```
// Check if the user is Logged in, otherwise redirect to login page
if(!isset($_SESSION["loggedin"]) || $_SESSION["loggedin"] !== true){
    header("location: logpage.php");
    exit;
}
```

2. Sign-up

When users try to enter their sign-up information, we use variables such as \$username_err, \$password_err, \$email_err, \$city_err, \$profile_err to check if they have entered all necessary input. Otherwise, an error message will display. And we use SELECT username FROM user WHERE username = ?; to check if the entered username has already been taken. For password, we set minimum password length equal to 6. For email, we use !preg_match('/^([a-z0-9]+[\\-\\.]+)(.[a-z0-9]+[\\-\\.]+)*@([a-z0-9\\-]+\\.)+[a-z]{2,6}\$/', trim(\$_POST["email"])) to check if user's input is the correct format of email so that this will not destroy our database when searching. Function trim() is also used to remove whitespace just in case users enter unnecessary characters.

```
if(empty(trim($_POST["email"]))){
    $email_err = "Please enter an email.";
} elseif(!preg_match('/^([a-z0-9]+[\\-\\.]+)(.[a-z0-9]+[\\-\\.]+)*@([a-z0-9\\-]+\\.)+[a-z]{2,6}$/', trim($_POST["email"]))) {
    $email_err = "Email format is not correct.";
} else{
    $email = trim($_POST["email"]);
}
```

After all necessary information has been fetched, they will be inserted to the User table.

```
// Check input errors before inserting in database
if(empty($username_err) && empty($password_err) && empty($confirm_password_err) &&
empty($email_err) && empty($city_err) && empty($state_err) && empty($country_err) && empty($uprofile_err)) {

    $sql = "INSERT INTO user (username, email, uprofile, passw, ucity, ustate, ucountry) VALUES (?, ?, ?, ?, ?, ?, ?)";

    if($stmt = mysqli_prepare($link, $sql)){
        mysqli_stmt_bind_param($stmt, "sssssss", $username, $email, $profile, $password, $city, $state, $country)
        if(mysqli_stmt_execute($stmt)){
            header("location: logpage.php");
        } else{
            echo "Oops! Something went wrong. Please try again later.";
        }
        mysqli_stmt_close($stmt);
    }
}

... // Close connection
mysqli_close($link);
```

3. Change Profile:

Similar to signing up, we use variables such as \$new_profile_err, \$new_email_err, \$new_city_err, \$new_country_err to check if users do not enter relevant information or the format is incorrect. After fetching relevant information, we use Update statement to update the relevant information in the User table.

```

if(empty($new_profile_err)&empty($new_email_err)&empty($new_city_err)&empty($new_country_err)){
    $new_profile = htmlspecialchars($_POST["new_profile"]);
    $new_email = htmlspecialchars($_POST["new_email"]);
    $new_city = htmlspecialchars($_POST["new_city"]);
    $new_country = htmlspecialchars($_POST["new_country"]);

    $sql = "UPDATE user SET uprofile = ?,email=?,ucity=?,ucountry=? WHERE userid = ?";
    if($stmt = mysqli_prepare($link, $sql)){
        mysqli_stmt_bind_param($stmt, "ssssi", $new_profile,$new_email,$new_city,$new_country, $param_id);
        $param_id = $_SESSION["userid"];
        if(mysqli_stmt_execute($stmt)){
            header("location: main.php");
        } else{
            echo "Oops! Something went wrong. Please try again later.";
        }
        mysqli_stmt_close($stmt);
    }
}

```

4. Log out

After clicking the logout button, all session variables will be rest and users will be redirected to login page.

```

<?php
session_start();
// Unset all of the session variables
$_SESSION = array();
// Destroy the session.
session_destroy();
// Redirect to login page
header("location: logpage.php");
exit;
?>

```

5. Log in

When users need to log in, we will check if their entered username and password match the information in our database. If it is matched, we will set `$_SESSION["logged in"]`=True, and set `$_SESSION["userid"]` to be the current userid so that we will know who has logged in, which will be helpful to solve further request. If information is not matched, we will send an error message.

```

if(empty($username_err) && empty($password_err)){
    $sql = "SELECT userid, username, passw FROM user WHERE username = ?";
    if($stmt = mysqli_prepare($link, $sql)){
        mysqli_stmt_bind_param($stmt, "s", $param_username);
        $param_username = $username;
        if(mysqli_stmt_execute($stmt)){
            mysqli_stmt_store_result($stmt);
            if(mysqli_stmt_num_rows($stmt) == 1){
                mysqli_stmt_bind_result($stmt, $userid, $username, $get_password);
                if(mysqli_stmt_fetch($stmt)){
                    if($password==$get_password){
                        session_start();
                        $_SESSION["loggedin"] = true;
                        $_SESSION["userid"] = $userid;
                        $_SESSION["username"] = $username;
                        header("location: main.php");
                    } else{
                        $login_err = "Invalid password.";
                    }
                }
            } else{
                $login_err = "Invalid username.";
            }
        } else{
            echo "Oops! Something went wrong. Please try again later.";
        }
    }
}

```

6. Show user level

By default, every new user's level is basic. For those who have answered a few questions, we will calculate the number of likes they receive. This can be achieved by looking at the ThumbsUp table and GiveAnswer Table, and use count to calculate how many likes this user has gained. 5 Points per like. If they receive more than 10 points, but less than 50 points, they will be leveled up to advanced. And if they receive more than 50 points. They will be leveled up to expert. And we will then use update statements to update their classid in the User table.

```
if ($stmt = $mysqli->prepare("SELECT count(*) as likes
    From thumbsup join giveAnswer on GiveAnswer.answerid=Thumbsup.answerid
    where GiveAnswer.userid=?"
    Group by GiveAnswer.userid")){
    $stmt->bind_param("i", $this_user);
    $stmt->execute();
    $stmt->bind_result($num_likes);
    if($stmt->fetch()){
        echo "You have $num_likes likes!";
        echo " ";
        $total=$num_likes * 5;
        if($total>10 and $total<50){
            $classid=2;
        }
        else if($total>=50){
            $classid=3;
        }
    }
}

if ($stmt2 = $mysqli->prepare("UPDATE user SET classid=? where userid=?")) {
    $stmt2->bind_param("ii", $classid, $this_user);
    $stmt2->execute();
}
```

7. Question

Similar as above, we use variables such as \$new_question_err, \$new_question_des_err, \$topic_topic_err to check if the users have entered all necessary input. Otherwise, an error message will display.

```
<div class="form-group">
    <textarea type="text" name="new_question" class="form-control "><?php echo (!empty($new_question_err)) ? 'is-invalid' : ''; ?><?php echo $new_question; ?></textarea>
    <span class="invalid-feedback"><?php echo $new_question_err; ?></span>
</div>
<p>Question Description</p>
<div class="form-group">
    <textarea type="text" name="new_question_des" class="form-control "><?php echo (!empty($new_question_des_err)) ? 'is-invalid' : ''; ?><?php echo $new_question_des; ?></textarea>
    <span class="invalid-feedback"><?php echo $new_question_des_err; ?></span>
</div>
<p>Topic</p>
<div class="form-group">
    <select name="new_topic" class="form-control "><?php echo (!empty($new_topic_err)) ? 'is-invalid' : ''; ?><?php echo $new_topic; ?></select>
```

We used prepare statement and htmlspecialchars() to guard against sql injections or cross-site scripting. To update a question into the database, we need to update three tables, question, ask and questiontopic.

To insert question table, we insert the question title, body, current_timestamp. The isResolved indicates whether the question is resolved, which is set to zero when the question has just been posted. Also we set the best answerid to null by default.

```
$sql = "INSERT into question(title,body,post_time,isResolved,bestanswerid) values (?,?,".CURRENT_TIMESTAMP.",0,null)"

if($stmt = mysqli_prepare($link, $sql)){
    $param_id = $_SESSION["userid"];
    mysqli_stmt_bind_param($stmt, "ss", htmlspecialchars($new_question), $new_question_des);

    if(!mysqli_stmt_execute($stmt)){
        echo "Oops! Something went wrong. Please try again later.";
    }
    $last_qid = mysqli_insert_id($link);
    // Close statement
    mysqli_stmt_close($stmt);
}
```

To insert ask table, we fetch userid through session and insert the qid and userid.

```
$sql2 = "INSERT into ask(qid,userid) values (?,?)";
if($stmt = mysqli_prepare($link, $sql2)){
    mysqli_stmt_bind_param($stmt, "ii", htmlspecialchars($last_qid),$param_id);

    if(mysqli_stmt_execute($stmt)){
        #session_destroy();
        #header("location: main.php");

    } else{
        echo "Oops! Something went wrong. Please try again later.";
    }
    // Close statement
    mysqli_stmt_close($stmt);
}
```

To insert topicquestion (father topics), we use recursive SQL query to fetch all father topics of the topic that the user has selected, then we insert all topicid with qid into the questiontopic table.

```
$sql3 = "WITH recursive cte (tid,fatherid) as (SELECT tid,fatherid from topic natural join topichierarchy
where topic.tid=? union all select p.tid, p.fatherid from topichierarchy p inner join cte on p.tid=cte.fatherid)select * from cte";
if($stmt = mysqli_prepare($link,$sql3)){
    mysqli_stmt_bind_param($stmt, "i", $topicid);
    $stmt->execute();
    $stmt->bind_result($tid,$fid);
    while ($stmt->fetch()) {
        if($stmt2 = $mysqli->prepare("INSERT INTO QuestionTopic(qid,tid) values (?,?)")){
            mysqli_stmt_bind_param($stmt2, "ii", $last_qid,$fid);
            $stmt2->execute();
        }
    }
    echo "</table>\n";
    $stmt->close();
    header("location: main.php");
}
```

To insert questiontopic (direct), we fetch the topicid that the user has selected and insert qid, topicid into the questiontopic table.

```

if($stmt = $mysqli->prepare("INSERT INTO QuestionTopic(qid,tid) values (?,?)")){
    mysqli_stmt_bind_param($stmt, "ii", $last_qid,$topicid);
    $stmt->execute();
}

```

8. Keyword search and relevance:

We use Match...Against instead of like to support keyword search function. After users have enter the keyword they are willing to search in the search bar, that keyword will be searched in our database. We provide three different search options (only search keyword in questions, search keyword in answers, or search keywords in both questions and answers). Searching filter will further be discussed just at the next section. We also display results by relevance. We prioritize if the keywords match the title, and then the question body over answertext.

```

$sql="SELECT distinct title, body, post_time, (MATCH (title) Against ('+$search' IN BOOLEAN MODE)*2+ Match
        (body) Against ('+$search' IN BOOLEAN MODE)*1+ Match
        (answertext) Against ('+$search' IN BOOLEAN MODE)*1) as relevance
FROM question natural join QuestionAnswer natural join answer
where
Match (title) Against ('+$search' IN BOOLEAN MODE)
OR Match (body) Against ('+$search' IN BOOLEAN MODE)
OR Match (answertext) Against ('+$search' IN BOOLEAN MODE)
Group by question.qid
order by relevance desc;";

```

9. Search filter:

In the main page, we use radio type to implement a selection function, which will send searchtype information to searchq.php where we use different values of search type to query differently for the result.

```

<input type="radio" name="searchtype" value="gs"
checked><label>General Search</label>
</div>
<div>
<input type="radio" name="searchtype" value="qs">
<label>Question Search</label>
</div>
<div>
<input type="radio" name="searchtype" value="as">
<label>Answer Search</label>
</div>

```

If the search type is general search, either match in question or match in answer will be listed in the search results. We also sort it by the relevance of the question (calculated by combination of match in question and match in answer) to the keyword.

```

if($searchtype=='gs'){
    $sql="SELECT distinct title, body, post_time, (MATCH (title) Against ('+$search' IN BOOLEAN MODE)*2+ Match
(body) Against ('+$search' IN BOOLEAN MODE)*1+ Match
(answertext) Against ('+$search' IN BOOLEAN MODE)*1) as relevance
FROM question left outer join QuestionAnswer on question.qid = questionanswer.qid left outer join answer on questionanswer.answerid = answer.answerid
where
Match (title) Against ('+$search' IN BOOLEAN MODE)
OR Match (body) Against ('+$search' IN BOOLEAN MODE)
OR Match (answertext) Against ('+$search' IN BOOLEAN MODE)
Group by title, body, post_time
order by relevance desc;";
}

```

If the search type is question search, only match in question will be listed in the search results. We also sort it by the relevance of the question (calculated by only match in question) to the keyword.

```

}else if($searchtype=='qs'){
    $sql="SELECT title, body, post_time, (MATCH (title) Against ('+$search' IN BOOLEAN MODE)*2+ Match
(body) Against ('+$search' IN BOOLEAN MODE)*1) as relevance
FROM question left outer join QuestionAnswer on question.qid = questionanswer.qid left outer join answer on questionanswer.answerid = answer.answerid
where
Match (title) Against ('+$search' IN BOOLEAN MODE)
OR Match (body) Against ('+$search' IN BOOLEAN MODE)
Group by title, body, post_time
order by relevance desc;";
}

```

If the search type is answer search, only match in answer will be listed in the search results. We also sort it by the relevance of the question (calculated by only match in answer) to the keyword.

```

}else if($searchtype=='as'){
    $sql="SELECT distinct title, body, post_time, (Match
(answertext) Against ('+$search' IN BOOLEAN MODE)*1) as relevance
FROM question left outer join QuestionAnswer on question.qid = questionanswer.qid left outer join answer on questionanswer.answerid = answer.answerid
where
Match (answertext) Against ('+$search' IN BOOLEAN MODE)
Group by title, body, post_time
order by relevance desc;";
}

```

10. Provide Answer:

In the question page, we are able to provide an answer to that question. To print out all the answers, we select all answers belong to this question and print out the result.

```

<?php
$sql="SELECT *
From question natural join questionanswer natural join answer natural join giveanswer natural join user
WHERE title='$title' AND post_time='$date'
order by answer_time desc";
$result2=mysqli_query($link,$sql);
$queryResults=mysqli_num_rows($result2);

if($queryResults>0){
    while($row=mysqli_fetch_assoc($result2)){
        echo"<div class='posts-wrapper'>
<p>".$row['answertext']."</p>
<p>".$row['username']."</p>
<p>".$row['answer_time']."</p>
<i class='fa fa-thumbs-up' style='color: blue'></i>
</div>";
        $this_answerid=$row['answerid'];
        $this_auser=$row['userid'];
    }
}

```

Similar to above, we use variables such as \$new_answer_err to check if the users have entered all necessary input. Otherwise, an error message will display.

```
<textarea type="text" name="new_answer" class="form-control form-control-lg" style="width: 100%; height: 100px; border: 1px solid #ccc; border-radius: 5px; padding: 5px; margin-bottom: 10px; font-size: 14px; font-family: inherit; color: inherit; background-color: inherit; transition: border-color 0.15s ease-in-out; >
<?php echo (!empty($new_answer_err)) ? 'is-invalid' : ''; ?>
<span class="invalid-feedback"><?php echo $new_answer_err; ?></span>
```

We used prepare statement and htmlspecialchars() to guard against sql injections or cross-site scripting. To update a question into the database, we need to update three tables, answer, giveanswer and questionanswer.

Firstly, we insert the answertext, answer_time into the answer table, and the answerid will be generated by auto-increment.

```
if ($stmt = mysqli_prepare($link, "INSERT into answer(answertext,answer_time) values (?,CURRENT_TIMESTAMP)")){
    mysqli_stmt_bind_param($stmt, "s", $new_answer);

    $stmt->execute();
    $last_aid = mysqli_insert_id($link);
    #echo "Last insert answerid";
    #echo "$last_aid";
    $stmt->close();
}
```

Then we insert userid and answerid to indicate which user provided this answer.

```
if ($stmt2 = mysqli_prepare($link, "INSERT into giveanswer(userid,answerid) values (?,?)")){
    mysqli_stmt_bind_param($stmt2, "ii", $_SESSION["userid"], $last_aid);
    $stmt2->execute();
    $stmt2->close();
}
```

After that, we insert the answerid and the qid to update that the answer is belong to this question.

```
if ($stmt3 = mysqli_prepare($link, "INSERT into questionanswer(qid,answerid) values (?,?)")){
    mysqli_stmt_bind_param($stmt3, "ii", $last_qid, $last_aid);
    $stmt3->execute();
    $stmt3->close();
}
```

11. Like an answer and show the current total likes per answer:

For each answer, we will calculate how many likes this answer has gained for now.

```
if ($stmt7 = mysqli_prepare($link, "SELECT count(*) as total_like from thumbsup where answerid=?")){
    mysqli_stmt_bind_param($stmt7, "i", $row['answerid']);
    $stmt7->execute();
    $stmt7->bind_result($num_likes);
    while ($stmt7->fetch()) {
        echo " $num_likes likes";
    }
    $stmt7->close();
}
```

Once a user clicks the button, we will insert who thumbs up which answerid. Also the number of likes beside the like button will be updated through refresh.

```

if(isset($_GET["answerid"])){
    $this_answer=$_GET["answerid"];
    #echo "$this_answer";
    if ($stmt8 = mysqli_prepare($link,"INSERT INTO thumbsup (answerid, userid) VALUES (?, ?)")){
        mysqli_stmt_bind_param($stmt8, "ii", $this_answer, $_SESSION['userid']);
        $stmt8->execute();
        $stmt8->close();
    }
}

```

12. Select one answer as the best:

Only the questioner has the permission to select the best. This is guaranteed by checking if the userid in the Question table is the same as the \$_SESSION['userid'].

```

if($this_uid_ask==$_SESSION["userid"]){
    echo ' ';
    echo '<a class="btn btn-info" name="best_button" href="article.php?title='.$_SESSION["title"].'
        &post_time='.$_SESSION["post_time"].'&answerid='.$row["answerid"].'&bestaid='.$row["answerid"].'>isBest</a>';
}

```

After clicking the isBest button, that answerid will be fetched. There will be an update on the Question table where bestanswerid=that answerid.

```

if(isset($_GET["bestaid"])){
    $best_aid=$_GET["bestaid"];
    if ($stmt9 = mysqli_prepare($link,"UPDATE question SET bestanswerid=? where qid=?")){
        mysqli_stmt_bind_param($stmt9, "ii", $best_aid, $this_qid);
        $stmt9->execute();
        $stmt9->close();
    }
}

```

We will also show the content of that best answer at the top of any other questions (just below the question description).

```

if(isset($_GET["bestaid"])){
    echo "<b>Following is the best answer:</b>";
    if ($stmt10 = mysqli_prepare($link,"SELECT answertext,username,answer_time from answer natural join giveanswer natural join user where answerid=?")){
        mysqli_stmt_bind_param($stmt10, "i", $_GET["bestaid"]);
        $stmt10->bind_result($banswertext,$busername,$banswer_time);
        $stmt10->execute();
        while ($stmt10->fetch()) {
            echo "<br>";
            echo"$banswertext";
            echo "<br>";
            echo"$busername";
            echo "<br>";
            echo "$banswer_time";
            echo "<br>";
        }
        $stmt10->close();
    }
}
?>

```

13. Select question is resolved or not:

Only the questioner has the permission to decide whether a question is resolved or not. This is guaranteed by checking if the userid in the Question table is the same as the \$_SESSION['userid'].

```

if ($this_uid_ask==$_SESSION["userid"]){
    ?
    <form action="" method="post">
        <input type="submit" name="resolved_b" value="Set question as Resolved" a href="<?php $_SERVER['PHP_SELF']; ?>">
    </form>
}

```

When we first click on the question, we will fetch question title, question description , post_time, isResolved attribute from the database, if isResolved=1, we will print the question has been resolved, or print the question has not been resolved.

```
$sql="SELECT *
From question
WHERE title='".$title' AND post_time='".$date."'";
$result=mysqli_query($link,$sql);
$queryResults=mysqli_num_rows($result);

if($queryResults>0){
    echo "<br>";
    #echo "<b>Is Resolved?</b>";
    while($row=mysqli_fetch_assoc($result)){
        if($row['isResolved']==1){
            echo "<b>This question has been resolved.</b>";
        }else{
            echo "<b>This question has not been resolved.</b>";
        }
        echo"<div class='article-box'>
<h3>".$row['title']."</h3>
<p>".$row['post_time']."</p>
<p>".$row['body']."</p>
<br>
</div>";
    }
}
```

We have a button for questioner called “Set question as resolved”. Once the user click on it, it will update the table Question and set attribute isResolved to be 1.

```
<?php
if ($this_uid_ask==$_SESSION["userid"]){
?
<form action="" method="post">
    <input type="submit" name="resolved_b" value="Set question as Resolved" a href=<?php $_SERVER['PHP_SELF']; ?>">
</form>
<?php
    if(isset($_POST['resolved_b'])){
        if ($stmt6 = mysqli_prepare($link,"UPDATE question SET isResolved = '1' WHERE qid = ?")){
            mysqli_stmt_bind_param($stmt6, "i", $this_qid);
            $stmt6->execute();
            $stmt6->close();
            #$_SERVER['PHP_SELF'];
        }
    }
    #header('Location: article.php?title='.$_SESSION["title"]. '&post_time=' .$_SESSION["post_time"]. '');
}
```

14. Edit an answer:

Only the answerer of that particular answer can see an edit button beside his answer. This is guaranteed by checking if the answerid=\$_SESSION['userid'].

```
if($this_auser==$_SESSION['userid']){
    $_SESSION['changedAid']=$this_answerid;
    echo '<a class="btn btn-outline-success" name="edit_button" href="edit.php">Edit</a>';
    echo ' ';
    echo '<a class="btn btn-danger" name="delete_button" href="article.php?title=' .$_SESSION["title"]. '&post_time=' .$_SESSION["post_time"]. '>Delete</a>';
    echo ' ';
}
```

After clicking button, they will be redirected an edit page. We will first use \$_SESSION['changedAid'] to check which answer will be changed. And then update the answer table. We used prepare statement and htmlspecialchars() to guard against SQL injections or cross-site scripting.

```
$changed=$_SESSION['changedAid'];
#echo "$changed";
$new_edit = $new_edit_err="";

if($_SERVER["REQUEST_METHOD"] == "POST"){
    if(empty($_POST["new_edit"])){
        $new_edit_err = "Please reanswer before submit or click cancel.";
    }
    else{
        $new_edit = $_POST["new_edit"];
        echo "$new_edit";
    }

    if(empty($new_edit_err)){
        $sql = "UPDATE answer SET answertext = ?, answer_time=CURRENT_TIMESTAMP(), isNew='1' WHERE answerid = ?";
        if($stmt = mysqli_prepare($link, $sql)){
            mysqli_stmt_bind_param($stmt, "si", htmlspecialchars($new_edit), $changed);
            $stmt->execute();
            $stmt->close();
        }
    }
    mysqli_close($link);
    header('location: article.php?title='.$_SESSION["title"].'&post_time='.$_SESSION["post_time"]. '');
}
```

15. Delete an answer:

Only the answerer of that particular answer can see the delete button beside his answer. This is guaranteed by checking if the answerid==\$_SESSION['userid']. \$_SESSION['changedAid'] is used to record the changed answerid.

```
if($this_auser==$_SESSION['userid']){
    $_SESSION['changedAid']=$this_answerid;
    echo '<a class="btn btn-outline-success" name="edit_button" href="edit.php">Edit</a>';
    echo ' ';
    echo '<a class="btn btn-danger" name="delete_button" href="article.php?title='.$_SESSION["title"].'&post_time='.$_SESSION["post_time"].'&delete='.$row["answerid"].'>Delete</a>';
    echo ' ';
}
```

After the delete button is clicked, there will be updates in Answer table, giveanswer table, and questionanswer.

```
if(isset($_GET["delete"])){
    $this_answer=$_GET["delete"];
    #echo "$this_answer";
    #echo "fetch";
    if ($stmt11 = mysqli_prepare($link,"DELETE FROM answer where answerid=?")){
        mysqli_stmt_bind_param($stmt11, "i", $this_answer);
        $stmt11->execute();
        $stmt11->close();
    }
    if ($stmt12 = mysqli_prepare($link,"DELETE FROM giveanswer where userid=? and answerid=?")){
        mysqli_stmt_bind_param($stmt12, "ii", $_SESSION['userid'], $this_answer);
        $stmt12->execute();
        $stmt12->close();
    }
    if ($stmt13 = mysqli_prepare($link,"DELETE FROM questionanswer where questionid=? and answerid=?")){
        mysqli_stmt_bind_param($stmt13, "ii", $_SESSION['qidd'], $this_answer);
        $stmt13->execute();
        $stmt13->close();
    }
}
```

16. Question/Answer List:

To fetch the question by this user, we could first get the current userid from session and then query on the title, body, and post_time of his question.

```
$userid=$_SESSION["userid"];
if ($stmt = $mysqli->prepare("SELECT title,body,post_time,sum(IFNULL(isNew,0))
FROM ask natural join question left join questionanswer on question.qid=questionanswer.qid
left join answer on questionanswer.answerid=answer.answerid where userid=?
GROUP BY question.qid
Order by post_time desc"))
{
$stmt->bind_param("s", $userid);
$stmt->execute();
$stmt->bind_result($title, $body,$post_time,$new);
// Printing results in HTML
```

To fetch the question by this user, we could first get the current userid from session and then query on the title, body, and post_time of his question.

```
$userid=$_SESSION["userid"];
if ($stmt = $mysqli->prepare("SELECT title,answertext,post_time,answer_time
FROM giveanswer natural join answer
join questionanswer on answer.answerid = questionanswer.answerid
natural join question
WHERE userid=? Order by answer_time desc"))
{
$stmt->bind_param("s", $userid);
$stmt->execute();
$stmt->bind_result($title,$body,$post_time,$answer_time);
// Printing results in HTML
```

17. Recent activity:

This part is similar to the part above except we limit the number of questions and answers listed in the recent activity section to the maximum of five.

```
if ($stmt = $mysqli->prepare("SELECT title,body,post_time,sum(IFNULL(isNew,0))
FROM ask natural join question
left join questionanswer on question.qid=questionanswer.qid
left join answer on questionanswer.answerid=answer.answerid
where userid=?
GROUP BY question.qid
Order by post_time desc LIMIT 5"))
{
$stmt->bind_param("s", $userid);
$stmt->execute();
$stmt->bind_result($title, $body,$post_time,$new);
```

```

if ($stmt = $mysqli->prepare("SELECT title,answertext,post_time,answer_time
FROM giveanswer natural join answer
join questionanswer on answer.answerid = questionanswer.answerid
natural join question WHERE userid=? Order by answer_time desc LIMIT 5")) {
    $stmt->bind_param("s", $userid);
    $stmt->execute();
    $stmt->bind_result($title,$body,$post_time,$answer_time);
    // Printing results in HTML
}

```

18. New answers notification:

We add an attribute isNew to our answer table. When inserting answers, the default isNew value is 1. We query on the sum of isNew value to indicate the number of new answers provided to the question.

```

if ($stmt = $mysqli->prepare("SELECT title,body,post_time,sum(IFNULL(isNew,0))
FROM ask natural join question
left join questionanswer on question.qid=questionanswer.qid
left join answer on questionanswer.answerid=answer.answerid
where userid=?
GROUP BY question.qid
Order by post_time desc LIMIT 5")) {
    $stmt->bind_param("s", $userid);
    $stmt->execute();
    $stmt->bind_result($title, $body,$post_time,$new);
    // Printing results in HTML
}

```

Then on the question page, if the question owner views the answer, (this means that the question owner is the user who visit this page), the isNew value will be set to 0. Then if we go back to main page again and query the number of new answers, these answers which have been viewed will no longer contribute to the result.

```

$sql="SELECT qid,userid
From question natural join ask
WHERE title='".$title' AND post_time='".$date'';

if($stmt=$mysqli->prepare($sql)){
    $stmt->execute();
    $stmt->bind_result($qid,$WhoAsk);
    if($stmt->fetch()){
        if($WhoAsk==$userid){
            #echo "You asked this!";
            $sql2="UPDATE question natural join questionanswer natural join answer set isNew = 0 where question.qid=?";
            if($stmt2=mysqli_prepare($link,$sql2)){
                mysqli_stmt_bind_param($stmt2, "i", $qid);
                mysqli_stmt_execute($stmt2);
                #echo "You viewed this!";
            }
        }
    }
}

```

19. Browng by topics:

We first implement subtopics button. We query on topichierarchy to get the subtopics of current topic and set the url to subtopic if the user click their button.

```
$input = $_GET["topic"];
$sql_subtopics = "SELECT distinct t2.topic_name from topic as t1 join topichierarchy on topichierarchy.fatherid = t1.tid
join topic as t2 on topichierarchy.tid = t2.tid where t1.topic_name = ?";
if($stmt=mysqli_prepare($link,$sql_subtopics)){
    mysqli_stmt_bind_param($stmt, "s", $input);
    $result = mysqli_stmt_execute($stmt);
    $stmt->bind_result($subtopic);
    while($stmt->fetch()){
        echo '<a class="btn btn-success" href="searchq.php?topic='.$subtopic.'">' . $subtopic . '</a>';
        echo " ";
    }
}
```

Then we select all questions belong to this topic and output them by chronological order. If there is no result, we will output “No result!” in this page.

```
$sql="SELECT distinct title, body, post_time
FROM question natural join questiontopic natural join topic
where
topic_name = ?
order by post_time desc;";
if($stmt=mysqli_prepare($link,$sql)){
    mysqli_stmt_bind_param($stmt, "s", $input);
    $result = mysqli_stmt_execute($stmt);
    #$queryResult=mysqli_num_rows($result);
    $stmt->bind_result($title,$body,$post_time);
    $flag=0;
    if($stmt->fetch()){
        echo "<a href='article.php?title=".$title."&post_time=".$post_time."><div class='article-box'>
<h3>".$title."</h3></a>
<p>".$body."</p>
<p>".$post_time."</p>
</div>";
        $flag=1;
    }else{
        echo "No result!";
    }

    while($stmt->fetch()&&$flag==1){
        echo "<a href='article.php?title=".$title."&post_time=".$post_time."><div class='article-box'>
<h3>".$title."</h3></a>
<p>".$body."</p>
<p>".$post_time."</p>
</div>";
    }
    $stmt->close();
}
```