

VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



WEB PROGRAMMING

Assignment

English Testing Website

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1 Introduction

1.1 Project description

The main purpose of this project is to program a English testing online which provides various exams with multiple categories and difficulties.

This project helps us to understand more clearly about applying the MVC model in Web Programming.

1.2 Report organization

In our report consists of three main parts: "Requirement", "Design", and "Result".

1. Requirement: describe functional and non-functions of the website.
2. Design: describe the design of the website via UML diagrams.
3. Result: show the working cases of our website.
4. Conclusion: summarizing and future works.

2 Requirements

2.1 Functional requirements

- Sign-up and Login
 - New users can create a new account for the website with username and password. The notification is displayed to demonstrate the success or failure.
 - Registered users can login into their accounts. The notification is displayed to demonstrate a failure in case of invalid username or password.
 - Staff members and an admin can login to manage the website.
- Take exams
 - Users can select a category and a level to take an English exam.
 - If users log in, a result is stored to display in their exam history and processed in the website ranking. Otherwise, the results are displayed but not stored in the history.
- View a personal exam history
 - Users can view their exam history which indicates all information of a submission: category, level, score and date.
 - Exam history is displayed in forms of tables and charts, which is easy for users to summarize.
- View a website ranking
 - The ranking of all stored submission is displayed in the home page to show the great performance.
- Manage exams
 - Staff members are granted to manage all exams. They can manipulate exams: add questions, delete questions, and modify questions.
- Manage staff members
 - An admin has a permission to manage the staff members: add members and delete members.

2.2 Non-functional requirements

- The color of the website should be appropriate and beautiful.
- The website should be able to work well on many different types of browser like Chrome, Opera, Microsoft Edge, Firefox,...
- The response time of the website should be fast.
- The interface of the website should be attractive to users.
- The amount of time that the website loads the information from the database should be insignificant.

3 Design

3.1 Database design

3.1.1 ER Model

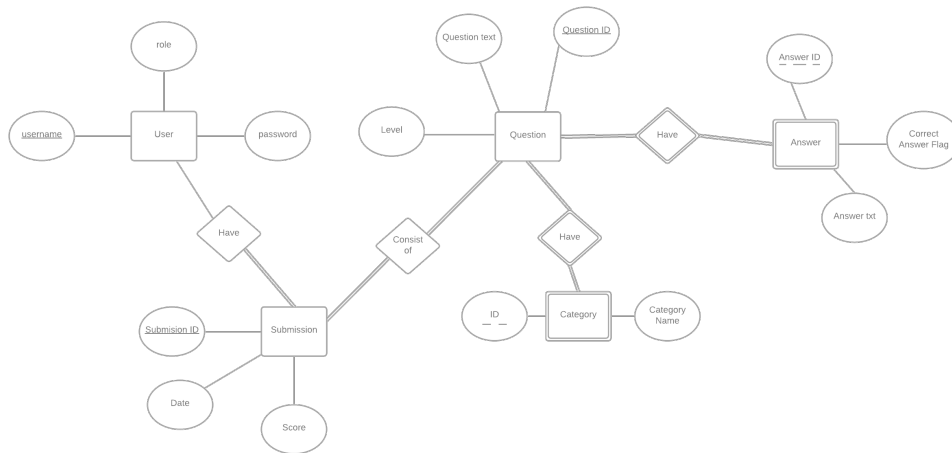


Figure 1: ER diagram

3.1.2 Relational Model

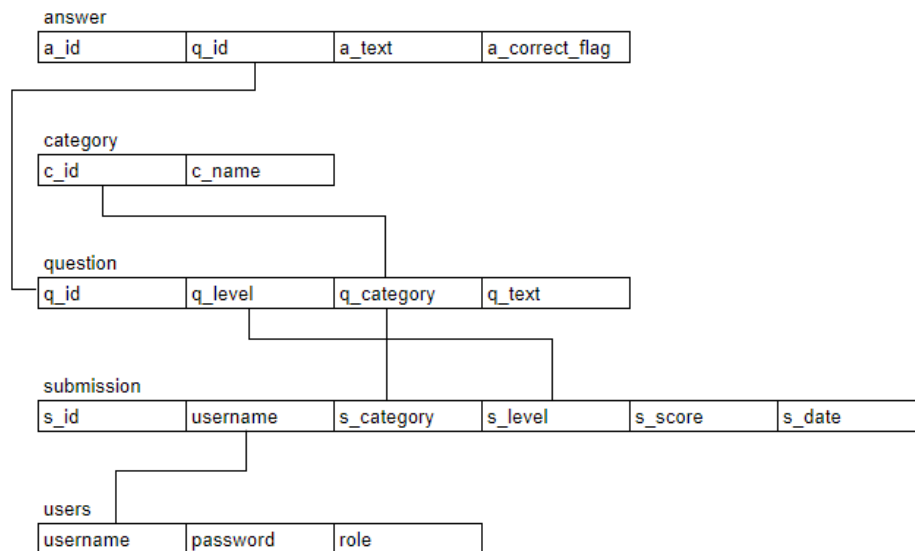


Figure 2: Relational diagram

3.2 Website design

3.2.1 Use-case diagram

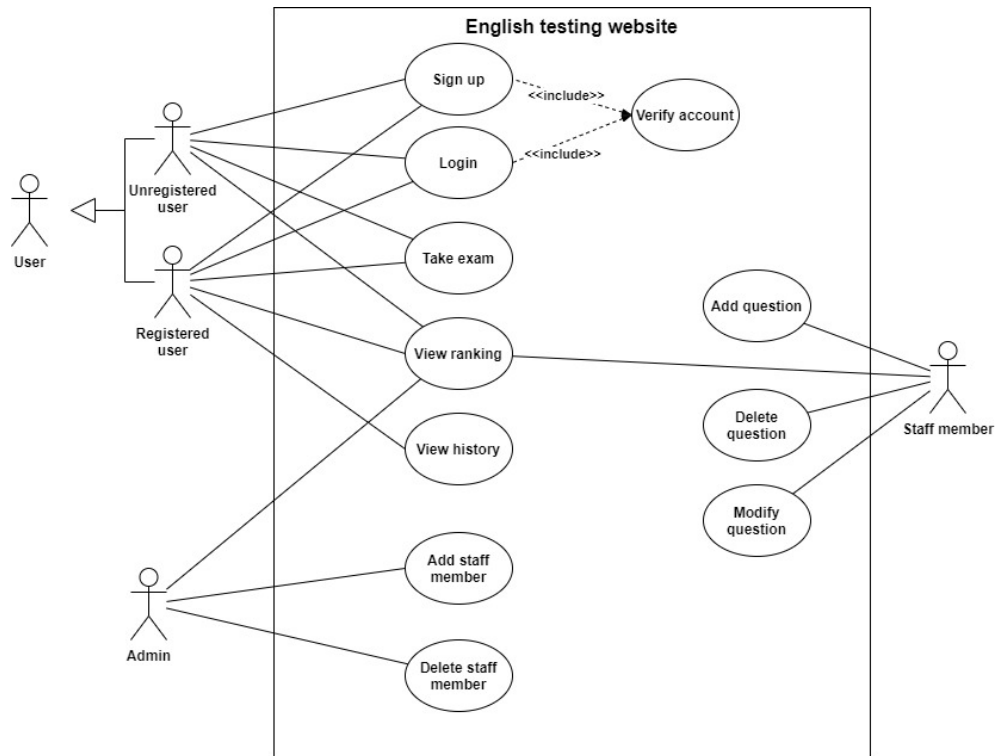


Figure 3: Use-case diagram

3.2.2 Class diagram

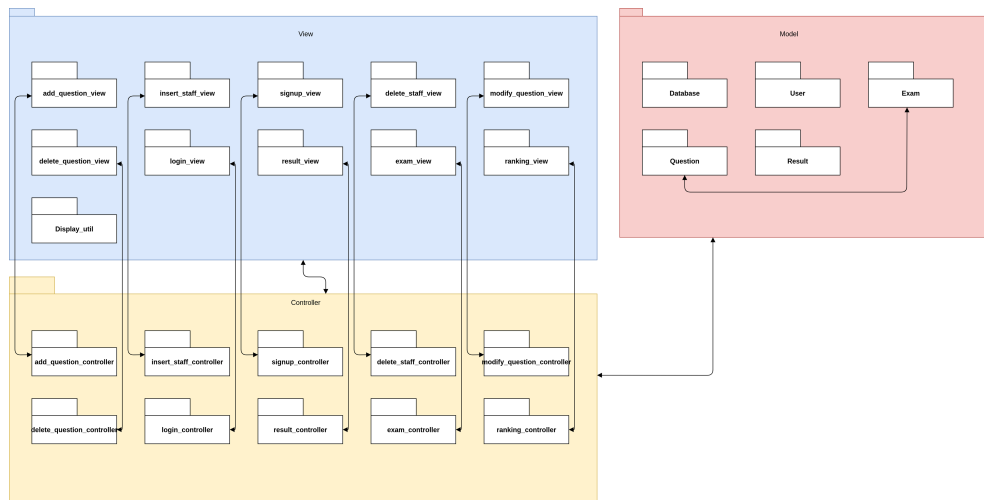


Figure 4: Class diagram

3.2.3 Sequence diagram

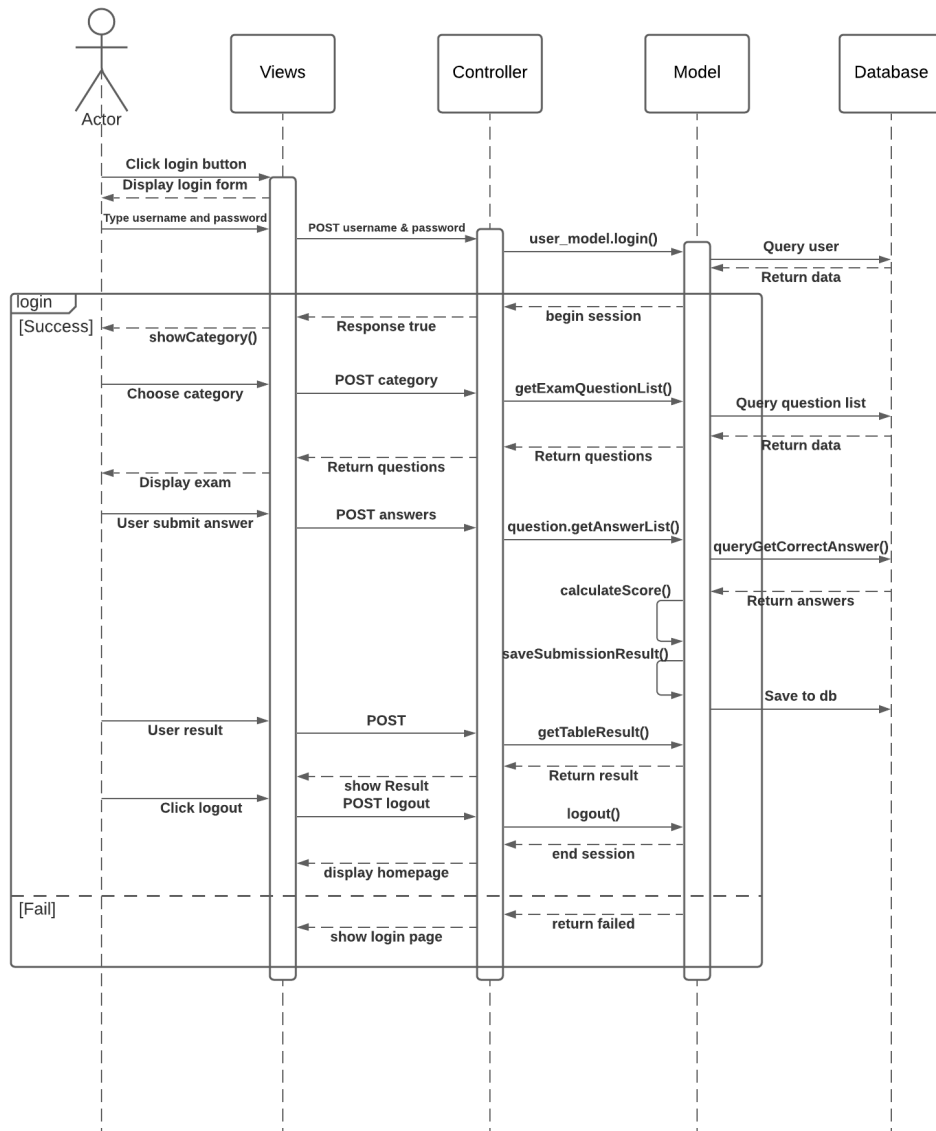


Figure 5: Sequence diagram

3.2.4 Activity diagram

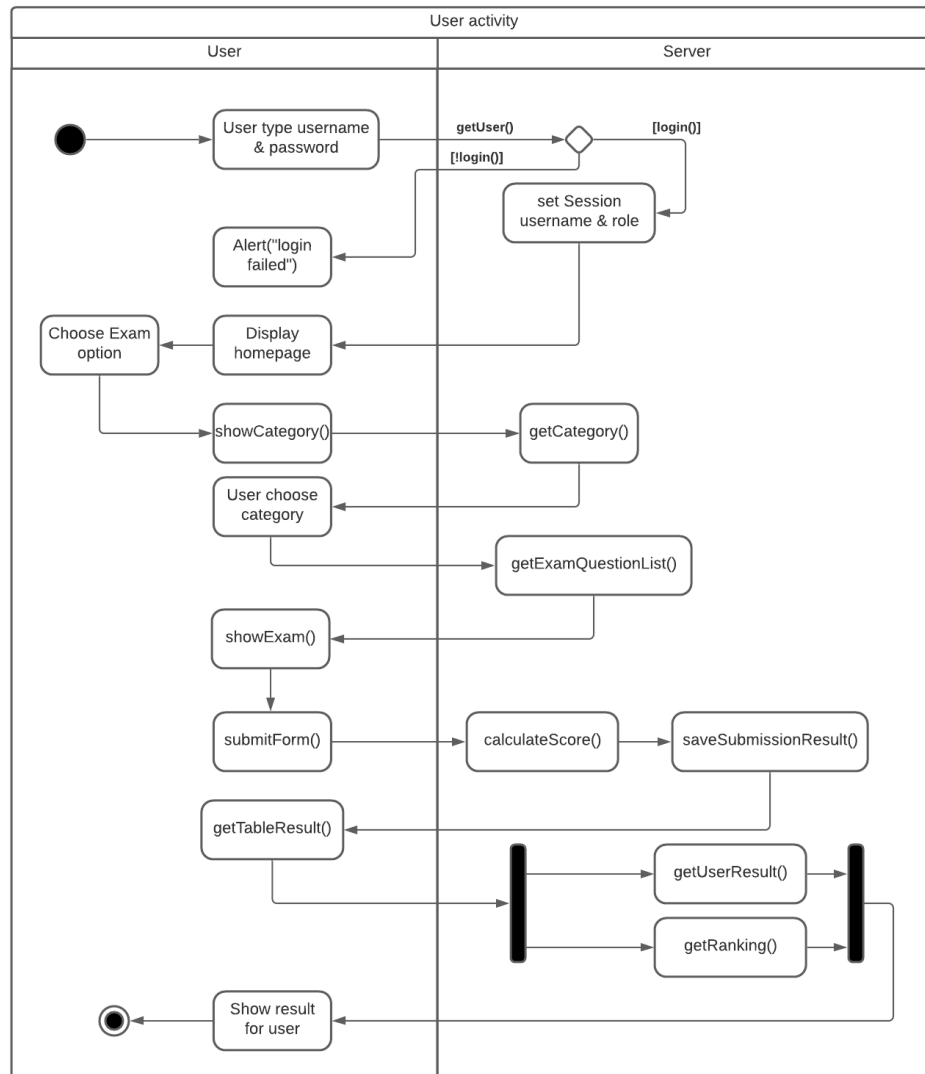
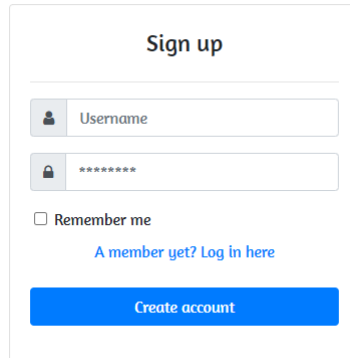


Figure 6: Activity diagram

4 Result

4.1 Sign-up and Login

4.1.1 Sign-up



The sign-up form is titled "Sign up". It contains two input fields: "Username" with a user icon and "Password" with a lock icon and masked characters. Below the password field is a checkbox labeled "Remember me". A link "A member yet? Log in here" is positioned below the checkbox. At the bottom is a blue button labeled "Create account".

Figure 7: Sign-up page

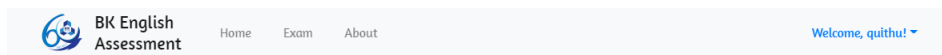
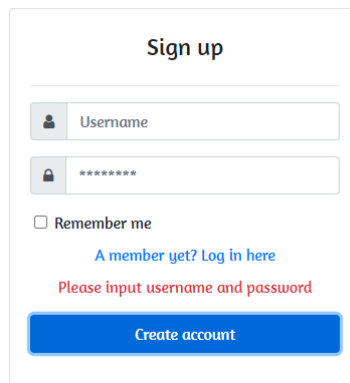


Figure 8: Sign-up success and log in automatically

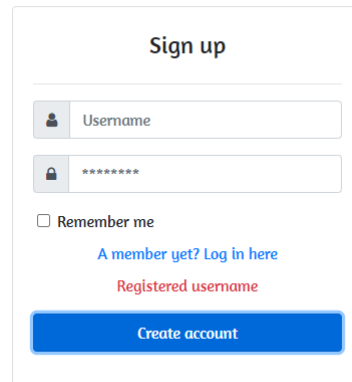
When sign up with blank username or password:



The sign-up form is identical to Figure 7, but it includes a red error message "Please input username and password" below the "Log in here" link.

Figure 9: Sign-up with blank username or password

When sign up with an registered username:



Sign up

Username

☐ Remember me

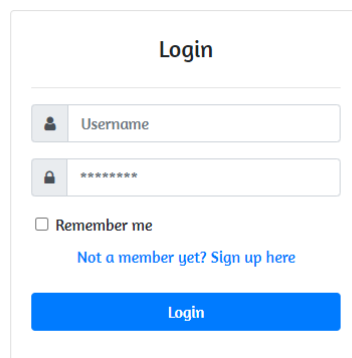
[A member yet? Log in here](#)

Registered username

Create account

Figure 10: Sign-up with an registered username

4.1.2 Login



Login

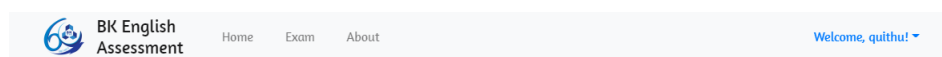
Username

☐ Remember me

[Not a member yet? Sign up here](#)

Login

Figure 11: Login page




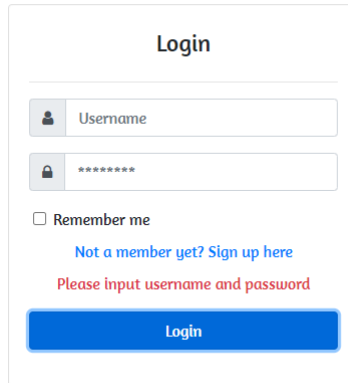
 BK English Assessment Home Exam About [Welcome, quithu!](#) ▼

Figure 12: Login success

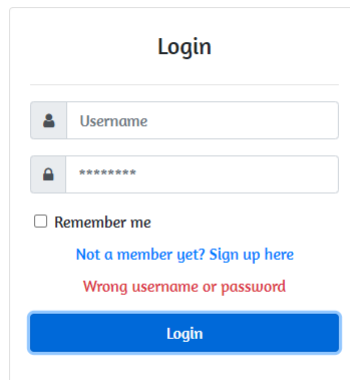
When login with blank username or password:



The image shows a login form titled "Login". It contains two input fields: "Username" and "Password". The "Username" field is empty, and the "Password" field contains eight asterisks. Below the fields is a checkbox labeled "Remember me" which is unchecked. There are two links: "Not a member yet? Sign up here" in blue and "Please input username and password" in red. At the bottom is a blue "Login" button.

Figure 13: Login with blank username or password

When login with wrong username or password:

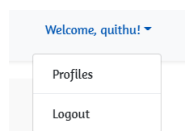


The image shows a login form titled "Login". It contains two input fields: "Username" and "Password". The "Username" field is empty, and the "Password" field contains eight asterisks. Below the fields is a checkbox labeled "Remember me" which is unchecked. There are two links: "Not a member yet? Sign up here" in blue and "Wrong username or password" in red. At the bottom is a blue "Login" button.

Figure 14: Login with wrong username or password

4.1.3 Logout

When logout, user go directly to homepage



The image shows a user profile dropdown menu. The top bar says "Welcome, quithu! ▼". Below it is a dropdown menu with two options: "Profiles" and "Logout". The "Logout" option is highlighted with a blue underline.

Figure 15: Logout



4.2 Take exams

4.2.1 Select Category

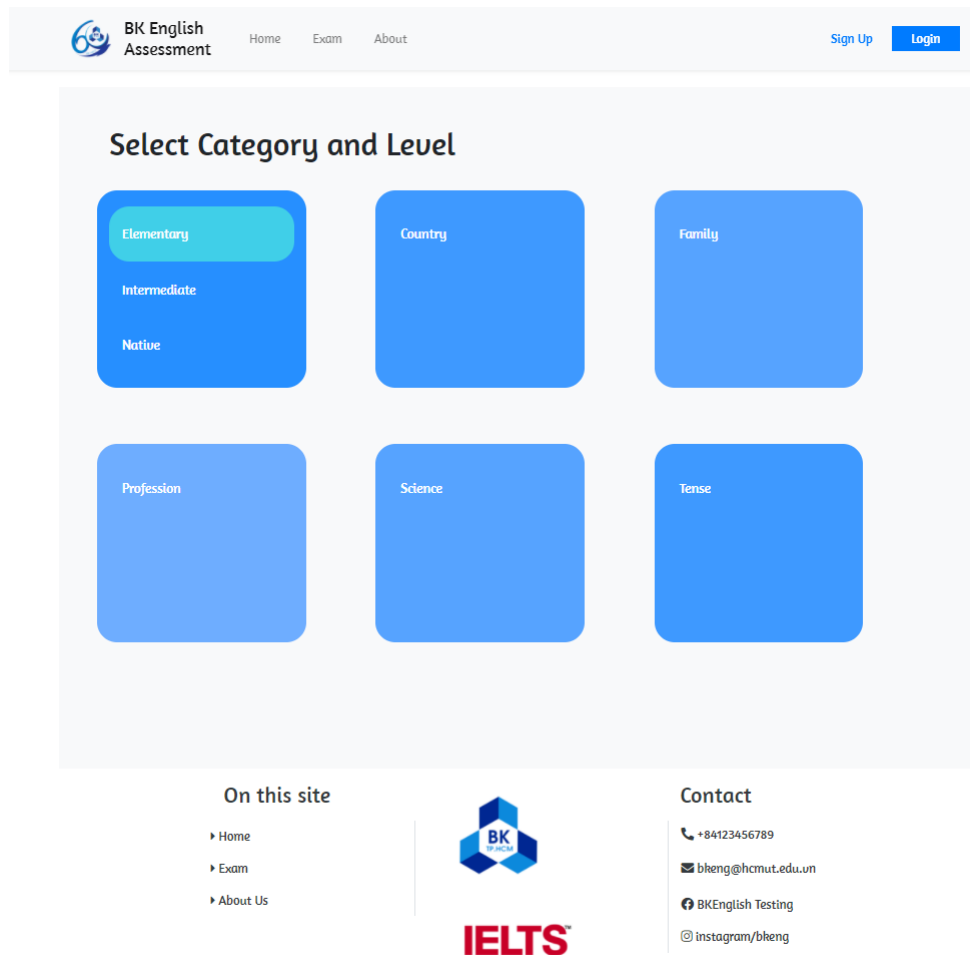


Figure 16: Category Selection

4.2.2 Exam page

1 What can a Jesus Christ lizard do?

☐ Jump

☐ Fly

☐ Walk on water

2 Which of the following is not a type of antelope?

☐ Marten

☐ Impala

☐ Gazelle

3 How many arms (mistakenly called tentacles) do octopuses have?

☐ 8

☐ 12

☐ 10

4 What's the longest a lobster can live?

☐ Less than 5 years

☐ 30 years old

☐ More than 100 years

5 Which of these animals uses echolocation to navigate?

☐ Mice

☐ Pigs

☐ Dolphins

6 What is a group of owls called?

☐ an Army

☐ a Surprise

☐ A Parliament

7 What type of animal would you find in an apiary?

☐ Bees

☐ Birds

☐ Apes

8 How many rhinoceroses still exist in the wild?

☐ about a million

☐ about 10000

☐ about 25000

9 In what mountain range could you encounter a wild yak?

☐ Alps

☐ Andes

☐ Himalayas

10 In what country would you find the world's northernmost wild monkey population?

☐ India

☐ Vietnam

☐ Japan

Submit

Figure 17: Clear Exam Page



4.2.3 Unfinished Submit

BK English Assessment Home

Sign Up Login

YOU STILL HAVE 4 QUESTION LEFT

OK

7 What type of animal would you find in an apiary?

- ☐ Bees
- ☐ Birds
- ☐ Apes

8 How many rhinoceroses still exist in the wild?

- ☐ about a million
- ☐ about 10000
- ☐ about 25000

9 In what mountain range could you encounter a wild yak?

- ☐ Alps
- ☐ Andes
- ☐ Himalayas

10 In what country would you find the world's northernmost wild monkey population?

- ☐ India
- ☐ Vietnam
- ☐ Japan

Submit

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Figure 18: Submit Half Way



4.2.4 Exam Result

Animal > Elementary

**Congratulation, you got
40/100**

1. What can a Jesus Christ lizard do?
☐ Jump
☐ Fly
☒ Walk on water
2. Which of the following is not a type of anteater?
☐ Marten
☐ Impala
☒ Gazelle
3. How many arms (mistakenly called tentacles) do octopuses have?
☐ 8
☐ 12
☒ 10
4. What's the longest a lobster can live?
☐ Less than 5 years
☐ 30 years old
☒ More than 100 years
5. Which of these animals uses echolocation to navigate?
☐ Mice
☐ Pigs
☒ Dolphins
6. What is a group of owls called?
☐ an Army
☒ a Squirrel
☐ A Parliament
7. What type of animal would you find in an apiary?
☐ Bees
☒ Birds
☐ Apes
8. How many rhinoceroses still exist in the wild?
☐ about a million
☐ about 100000
☒ about 25000
9. In what mountain range could you encounter a wild yak?
☐ Alps
☒ Andes
☐ Himalayas
10. In what country would you find the world's northernmost wild monkey population?
☐ India
☒ Vietnam
☐ Japan

[Retry](#)

Figure 19: Submission Result

4.3 View submissions

There are 2 options to go to profiles (view submissions)

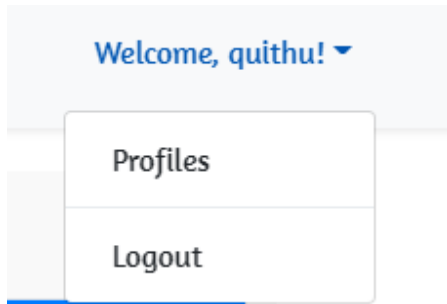


Figure 20: Profiles at header



Figure 21: Profiles at footer

If user already did a exam a pie chart appear at profiles page, otherwise, nothing will be showed

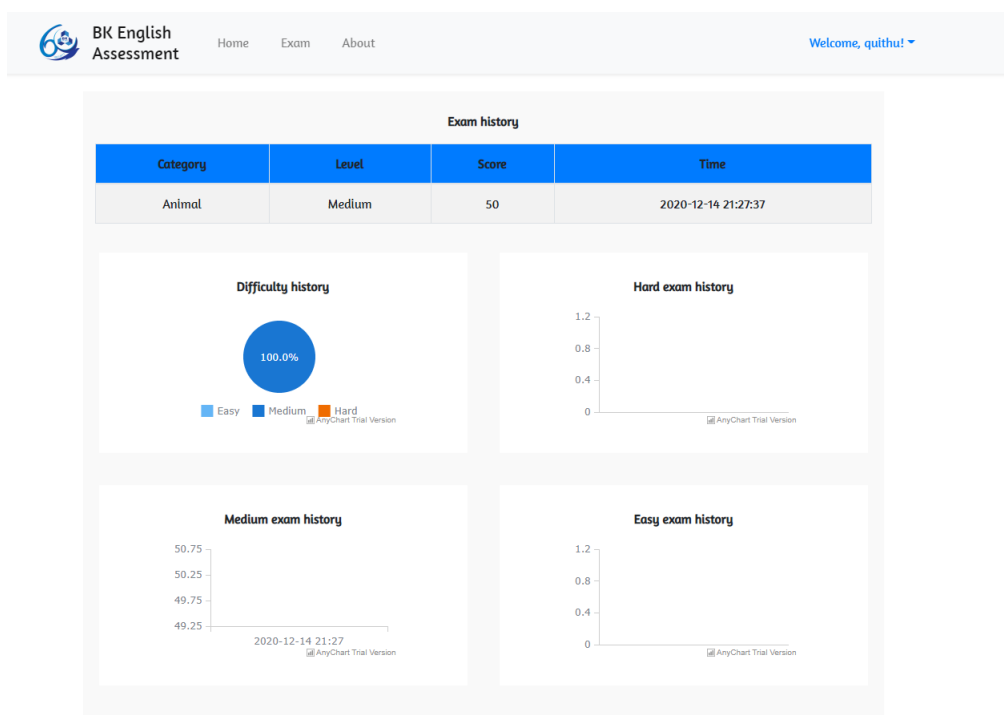



Figure 22: Profiles

4.4 Manage exams

4.4.1 Add questions



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Welcome, staff! ▾



Select category and level to add new question

Category

Level

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Figure 23: Select Category and Level

4.4.2 Delete questions



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Select category and level to add new question

Category

Animal ▾

Level

Native ▾

Question	Answer	Correct
New question...	Answer 1...	<input type="radio"/>
	Answer 2...	<input checked="" type="radio"/>
	Answer 3... Open Grammarly	<input type="radio"/>

Add

Please fill all the information!!!

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Figure 24: Add Empty Cell

4.4.3 Modify question



Select category and level to add new question

Category

Family ▾

Level

Intermediate ▾

Question	Answer	Correct
Your father is your grandpa ____	son	<input checked="" type="radio"/>
	daughter	<input type="radio"/>
	niece	<input type="radio"/>

Add

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Figure 25: Fill The Cell

4.5 Manage accounts

4.5.1 Add staff members

4.5.2 Delete staff members



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Welcome, staff! ▾

Select category and level to add new question

CategoryLevel

Add successfully!

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Figure 26: Add Successful

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Welcome, staff! ▾

Select category and level to add new question

CategoryLevel

AnimalNative

Question	Answer	Correct
What does the fox say?	mow mow	<input type="radio"/>
	pa pou pa pou	<input checked="" type="radio"/>
	bark bark	<input type="radio"/>

Add

Failed to add question!!!

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Figure 27: Add duplicate question



Select category and level to delete question(s)

Category

Level

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Figure 28: Select Category and Level



8		Cheetah	<input type="checkbox"/>
		Leopard	
9	This animal fasts for about 8 months in a year and yet is active, gives birth, and nurses its young while fasting. Name the animal.	Lion	
		Polar bear	<input type="checkbox"/>
		Frog	
10	In which of the following species does the male have mammary glands to feed milk to its young?	Blue Whale	
		Sunda flying lemur	<input type="checkbox"/>
		Dayak fruit bat	

[Delete](#)

You have not chosen any questions!!!

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Figure 29: Delete Nothing

10		Sunda flying lemur	<input checked="" type="checkbox"/>
		Dayak fruit bat	
11	What does the fox say?	pa pow pa pow	
		moew moew	<input type="checkbox"/>
		bark bark	

[Delete](#)

The number of questions after deleting must be greater and equal 10!!!

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Figure 30: Delete Fail

Category		Level	
animal		2	
1	For how many years have the dinosaurs been extinct?	<input type="text" value="About 25 million years"/> <input type="text" value="About 45 million years"/> <input checked="" type="checkbox"/> <input type="text" value="About 100 million years"/>	<input type="checkbox"/>
2	Dinosaur (fossil) refers to a group of	<input type="text" value="Fishes"/> <input type="text" value="Insects"/> <input checked="" type="checkbox"/> <input type="text" value="Birds"/>	<input type="checkbox"/>
3	Which part becomes modified as the tail of elephant?	<input type="text" value="Caudex"/> <input type="text" value="Malar"/> <input type="checkbox"/> <input type="text" value="Second incisor"/>	<input type="checkbox"/>
4	Which of the following are warm blooded animals?	<input type="text" value="Whales"/> <input checked="" type="checkbox"/> <input type="text" value="Alpaca"/> <input type="checkbox"/> <input type="text" value="Deer"/>	<input type="checkbox"/>
5	Agouti is the animal like to ...	<input type="text" value="Amphibians"/> <input type="checkbox"/> <input type="text" value="Mammals"/> <input checked="" type="checkbox"/> <input type="text" value="Birds"/>	<input type="checkbox"/>
6	The project aims to conserve the endangered species, launched by the union ministry of environment and forest covers the states of	<input type="text" value="Jammu and Kashmir and Himachal Pradesh"/> <input checked="" type="checkbox"/> <input type="text" value="Punjab and Uttarakhand"/> <input type="checkbox"/> <input type="text" value="Arunachal Pradesh only"/>	<input type="checkbox"/>
7	Among the following animals, the figures of which are found in the inner corners of the eyes?	<input type="text" value="Horse and bull"/> <input checked="" type="checkbox"/> <input type="text" value="Bull, deer and eagle"/> <input type="checkbox"/> <input type="text" value="Elephant, tiger and bull"/>	<input type="checkbox"/>
8	In which one of the following animals do distinct black stripes extend from the inner corners of the eyes to the mouth?	<input type="text" value="Jaguar"/> <input checked="" type="checkbox"/> <input type="text" value="Cheetah"/> <input type="checkbox"/> <input type="text" value="Leopard"/>	<input type="checkbox"/>
9	This animal fasts for about 8 months in a year and yet is active, gives birth, and nurses its young while fasting. Name the animal.	<input type="text" value="Lion"/> <input checked="" type="checkbox"/> <input type="text" value="Polar bear"/> <input type="checkbox"/> <input type="text" value="Frog"/>	<input type="checkbox"/>
10	In which of the following species does the male have mammary glands to feed milk to its young?	<input type="text" value="Blue Whale"/> <input checked="" type="checkbox"/> <input type="text" value="Sunda flying lemur"/> <input type="checkbox"/> <input type="text" value="Dayak fruit bat"/>	<input type="checkbox"/>
11	What does the 'ju' refer to?	<input type="text" value="ju pine pin pine"/> <input checked="" type="checkbox"/> <input type="text" value="Hindu Hindu"/> <input type="checkbox"/> <input type="text" value="Dark Dark"/>	<input type="checkbox"/>


Figure 31: Delete With Select

		Elephant, tiger and bull	
8	In which one of the following animals do distinct black stripes extend from the inner corners of the eyes to the mouth?	<input type="text" value="Jaguar"/> <input checked="" type="checkbox"/> <input type="text" value="Cheetah"/> <input type="checkbox"/> <input type="text" value="Leopard"/>	<input type="checkbox"/>
9	This animal fasts for about 8 months in a year and yet is active, gives birth, and nurses its young while fasting. Name the animal.	<input type="text" value="Lion"/> <input checked="" type="checkbox"/> <input type="text" value="Polar bear"/> <input type="checkbox"/> <input type="text" value="Frog"/>	<input type="checkbox"/>
10	In which of the following species does the male have mammary glands to feed milk to its young?	<input type="text" value="Blue Whale"/> <input checked="" type="checkbox"/> <input type="text" value="Sunda flying lemur"/> <input type="checkbox"/> <input type="text" value="Dayak fruit bat"/>	<input type="checkbox"/>

Delete question(s) successfully!

Figure 32: Delete Success



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HomeManage Exam ▾About Us

Welcome, staff! ▾

Select category and level to modify question(s)

Category

Level



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Figure 33: Select Category and Level

		Seoul	<input type="radio"/>
10	What is the name of popular middle eastern dish?	Dolma	<input checked="" type="radio"/>
		Pierogi	<input type="radio"/>
		Hummus	<input type="radio"/>
11	dwhtl	hduwl	<input type="radio"/>
		whdhl	<input checked="" type="radio"/>
		slt	<input type="radio"/>

Modify

You have not changed anything!!!

Figure 34: Delete Success



localhost says
ARE YOU SURE?

OK Cancel

BK English Assessment Home

Welcome, staff!

7		Finland	<input type="radio"/>
8	What is the official name of Big Ben tower?	Elizabeth Tower	<input checked="" type="radio"/>
		St Stephen's Tower	<input type="radio"/>
		The Victoria Tower	<input type="radio"/>
9	Where in Asia will you find Mount Bromo?	Vietnam	<input type="radio"/>
		Indonesia	<input checked="" type="radio"/>
		Seoul	<input type="radio"/>
10	What is the name of popular middle eastern dish?	Dolma	<input checked="" type="radio"/>
		Pierogi	<input type="radio"/>
		Hummus	<input type="radio"/>
11	Which country is near VN	Laos	<input checked="" type="radio"/>
		Japan	<input type="radio"/>
		America	<input type="radio"/>

Modify

Figure 35: Delete Success

		Seoul	<input type="radio"/>
10	What is the name of popular middle eastern dish?	Dolma	<input checked="" type="radio"/>
		Pierogi	<input type="radio"/>
		Hummus	<input type="radio"/>
11	Which country is near VN	Laos	<input checked="" type="radio"/>
		Japan	<input type="radio"/>
		America	<input type="radio"/>

Modify

Modify question(s) successfully!

Figure 36: Delete Success



5 Verification

5.1 Sign Up

Testcase	Set up	Action	Expected result
1	No user in the database	Enter any username and password	Sign up successfully, display home page and change header for user role
2	Have one or more users in the database	Enter username which not exist in the database with any password	Sign up successfully, display home page and change header for user role
		Enter username which exist in the database with any password	Sign up failed and stay at sign-up page

5.2 Log In

Testcase	Set up	Action	Expected result
3	No user in the database	Enter any username and password	Login failed and stay at login page
4	Have admin, staff and user in the database	Enter username which not exist in the database with any password	Login failed and stay at login page
		Enter username which exist in the database with wrong password	Login failed and stay at login page
		Enter username of user with corresponding password	Login successfully, display home page and change header for user role
		Enter username of admin with corresponding password	Login successfully, display home page and change header for admin role
		Enter username of staff with corresponding password	Login successfully, display home page and change header for staff role

5.3 Log Out

Testcase	Set up	Action	Expected result
5	Already login	Press logout button	Logout successfully and display login page

5.4 Add question

Testcase	Set up	Action	Expected result
6	Already login as staff. Have categories, levels, questions and answers in database. Already choose category and level	Leave some or all inputs as blank and click add button	Nothing changed in database and a notification appear to notify that not fill enough information.
		Enter all inputs and the question which appear in database	Nothing changed in database and a notification appear to notify the failure.
		Enter all inputs and the question which not exist in database	The question is added to the database and a notification appear to notify the success.

5.5 Delete question

Testcase	Set up	Action	Expected result
7	Already login as staff. Have categories, levels, questions and answers in database. Already choose category and level	Not choose any questions	Nothing changed in database and a notification appear to notify that nothing chosen.
		Choose one more more questions so that the remaining question after delete must be at least 10	Chosen questions deleted in database and on the web. A notification appear to notify the success.
		Choose one more more questions so that the remaining question after delete less than 10	Nothing changed in database and a notification appear to notify the failure.

5.6 Modify question



Testcase	Set up	Action	Expected result
8	Already login as staff. Have categories, levels, questions and answers in database. Already choose category and level	Not change any questions	Nothing changed in database and a notification appear to notify that nothing changed.
		Change any questions, answers and correct answer's flags	Changed questions, answer and correct answer's flags changed in database and notification appear to notify the success.

5.7 Add staff

Testcase	Set up	Action	Expected result
9	Already login as admin and no user in the database	Enter any username and password	Add staff successfully
10	Already login as admin and have one or more users in database	Enter username which not exist in database with any password	Add staff successfully.
		Enter username exist in database with any password	Add staff failed.

5.8 Delete staff

Testcase	Set up	Action	Expected result
11	Already login as admin and have staff(s) in database	Not choose any staffs	Nothing changed in database and a notification appear to notify that nothing chosen.
		Choose one more more staffs	Chosen staffs deleted in database and on the web. A notification appear to notify the success.

5.9 View category

Testcase	Set up	Action	Expected result
12	Have not login or already login as user. Have categories, levels, questions and answers in database	Press exam button	Display all the categories in database with three different levels.



5.10 Take exam

Testcase	Set up	Action	Expected result
13	Already view category and choose category, level for the exam	Not choose anything and press submit and submit.	Alert having 10 questions not chosen.
		Answer some questions and leave some questions unchecked then submit.	Alert still having questions not answered.
		Answer all questions and submit.	Show total points and correct answer of each question.

5.11 View ranking

Testcase	Set up	Action	Expected result
10	Already login as admin and no user in the database	Enter any username and password	Add staff successfully
10	Already login as admin and have one or more users in database	Enter username which not exist in database with any password	Add staff successfully.
		Enter username exist in database with any password	Add staff failed.

5.12 View history

Testcase	Set up	Action	Expected result
10	Already login as admin and no user in the database	Enter any username and password	Add staff successfully
10	Already login as admin and have one or more users in database	Enter username which not exist in database with any password	Add staff successfully.
		Enter username exist in database with any password	Add staff failed.



6 Conclusion

6.1 Summary

Our group has designed the English testing website with beautiful look and easy to use. The website provides various categories and levels for users, and also stores and visualizes exam history in order to make users manage and selects appropriate strategies to learn English. After this assignment, all group members have gained experiences in web programming as well as design a simple database system.

6.2 Future works

In the near future, our group would like to integrate more subjects to the website, more categories. Moreover, it is more practical when the website is deployed on the real hosting domain, and we will improve the security of the website.



References

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- [2] Bootstrap, <https://getbootstrap.com/docs/4.5/getting-started/introduction/>.