



WEB PROGRAMMING

Assignment 2

QuizVerse - Exam Question Bank

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1 Introductions

1.1 MVC Design Pattern

Model-View-Controller is the most frequently used Software Architectural design pattern. MVC design pattern specifies that an application consist of a data model, presentation information, and control information. The pattern requires that each of these be separated into different objects. It separates application functions:

- Model: Interacts with the database directly (SELECT, INSERT, UPDATE, DELETE).
- Controller: Accepts inputs and convert it into command for model or view.
- View: The representation of the information under many forms.

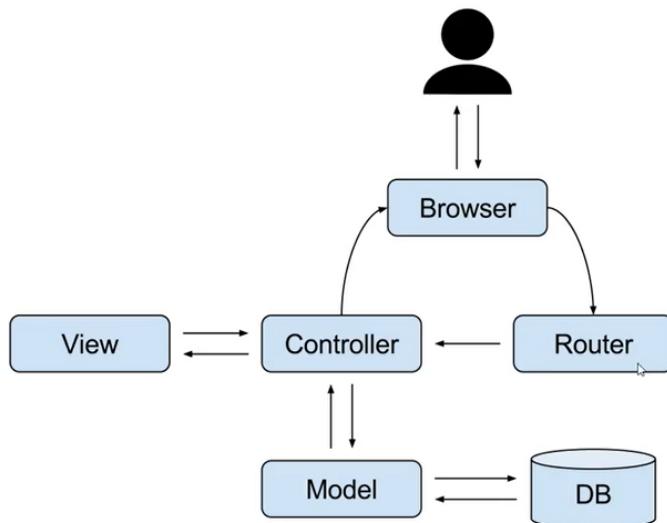


Figure 1: MVC Design Pattern

1.2 Libraries and Extensions

QuizVerse is developed from scratch, which means no framework is used. However, the below libraries are used in order to optimize its performance and appearance.

1.2.1 Bootstrap 4

In order to create a responsive website, this project uses Bootstrap 4 for front-end development. It includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins. Please visit getbootstrap.com for more information.

- Bootstrap CDN:

```
<link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css" integrity="sha384-Vkoo8x4CGsO3+Hhxv8T/Q5PaXtkKtu6ug5TOeNV6g iFeWPGFN9MuhOf23Q9Ifjh" crossorigin="anonymous">
```

```
<script src="https://code.jquery.com/jquery-3.4.1.slim.min.js" integrity="sha384-J6qa484bE1IMtT0iUlJ6JZGfZJyqFzjYBhWVnDZmZKu" crossorigin="anonymous"></script>
```

```
<script src="https://cdn.jsdelivr.net/npm/popper.js@1
.16.0/dist/umd/popper.min.js" integrity="sha384-Q6E
9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRVv
oxMfoo" crossorigin="anonymous"></script>

<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/js/bootstrap.min.js" integrity="sha384-
4wfSDF2E50Y2D1uUdj0O3uMBJnjuUD4Ih7YwaYd1iqfktj0Uo
d8GCExl3O8ifwB6" crossorigin="anonymous"></script>
```

1.2.2 Font Awesome

Font Awesome provides inline elements, which we use for icons. Please visit fontawesome.com for more information.

- Font Awesome CDN:

```
<script src="https://kit.fontawesome.com/b0724393dc.js"
crossorigin="anonymous"></script>

<link href="https://stackpath.bootstrapcdn.com/font-awesome/4.7.0/css/font-awesome.min.css" rel="stylesheet"
integrity="sha384-wvfXpqZZVQGK6TAh5
PVlGOfQNHSoD2xbE+QkPxCAFINEevoEH3Sl0sibVcOQVnN" crossorigin="anonymous">
```

1.2.3 AOS - Animate On Scroll Library

AOS - Animate On Scroll Library is a library to create animation while loading page.
Please visit <https://michalsnik.github.io/aos/> for futher details.

There are many ways that you can use it:

- Install using yarn, npm, bower

```
yarn add aos
npm install aos --save
bower install aos --save
```

- CDN Resources

```
<link href="https://unpkg.com/aos@2.3.1/dist-aos.css" rel="stylesheet">
<script src="https://unpkg.com/aos@2.3.1/dist-aos.js"></script>
```

- Then you initialize AOS:

```
<script>
  AOS.init();
</script>
```

1.2.4 FPDF

There is a function uses FPDF to export a PDF file for user. FPDF is a php class generates PDF files with pure PHP. FPDF has other advantages: high level functions. Here is a list of its main features:

- Choice of measure unit, page format and margins
- Page header and footer management
- Automatic page break
- Automatic line break and text justification
- Image support (JPEG, PNG and GIF)

- Colors
- Links
- TrueType, Type1 and encoding support
- Page compression

1.2.5 PDO

The PHP Data Objects (PDO) extension defines a interface for accessing databases in PHP.

- The PHP Data Objects (PDO) extension defines a lightweight, consistent interface for accessing databases in PHP. Each database driver that implements the PDO interface can expose database-specific features as regular extension functions. Note that you cannot perform any database functions using the PDO extension by itself; you must use a database-specific PDO driver to access a database server.
- PDO provides a data-access abstraction layer, which means that, regardless of which database you're using, you use the same functions to issue queries and fetch data. PDO does not provide a database abstraction; it doesn't rewrite SQL or emulate missing features. You should use a full-blown abstraction layer if you need that facility.
- PDO ships with PHP 5.1, and is available as a PECL extension for PHP 5.0; PDO requires the new OO features in the core of PHP 5, and so will not run with earlier versions of PHP.

2 QuizVerse

2.1 About

QuizVerse is an online exam question bank which supports lecturers in storing and managing courses, topics, questions, generate exams and export PDF exam file. QuizVerse is suitable for universities, where lecturers can create their own space and manage their own courses. A list of QuizVerse's functions is described as follows:

- Guest User:
 - Visit public pages
 - Register
 - Login
- General User (Lecturer):
 - Edit profile
 - Add / Edit / Delete Courses
 - Add / Edit / Delete Topics in each Course
 - Add / Edit / Delete Questions in each Topic
 - Create / Edit / Delete Exams
 - Add / Remove Questions in Exam
 - Export PDF file for Exam
 - Search for other Lecturers / Courses
 - Search for questions in a Course
- Admin User:
 - Edit / Delete Users
 - Other actions that a general user can do

2.2 Database Design

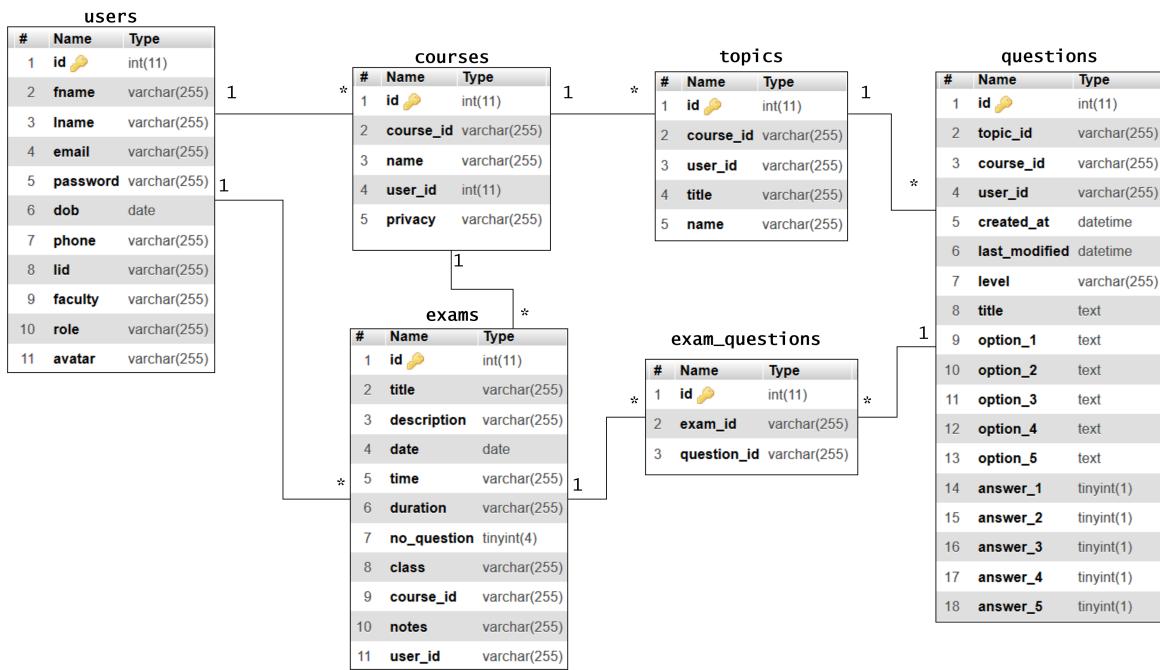


Figure 2: QuizVerse Database Design

Main tables are:

- users
- courses
- topics
- questions
- exams

Because the relationship between questions and exams is N - N, another table is used to store the relationship between them.

- exam-questions

2.3 Source Code

The source code structure of QuizVerse is shown in the below figure.

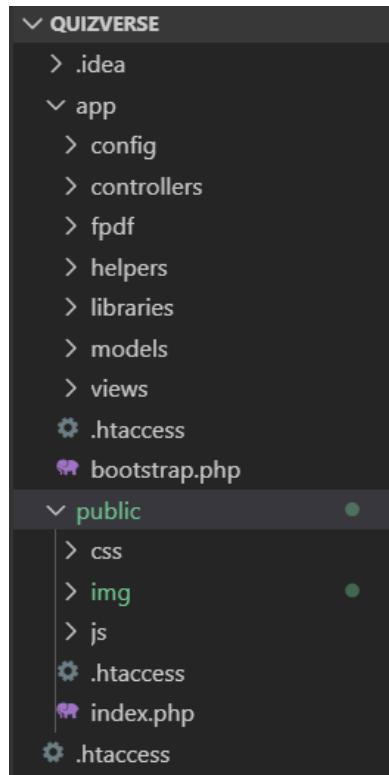


Figure 3: QuizVerse Source Code Structure

There are three main folders: controllers, models and views. Other important files are in libraries.

2.3.1 libraries

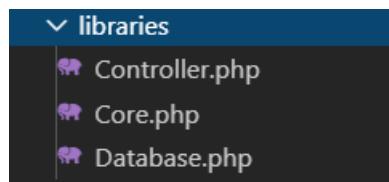


Figure 4: libraries folder

The libraries folder includes the definition of link. For example, the link "quizverse/users/edit/1" is broken down into:

- users controller
- edit function
- parameter (1)

2.3.2 controllers

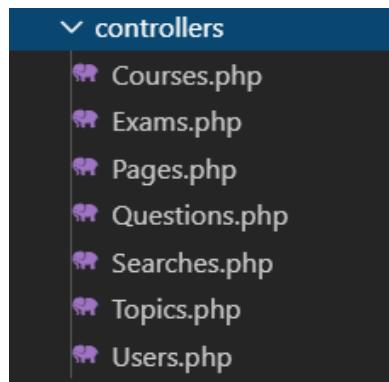


Figure 5: controllers folder

The controllers folder includes controllers, which contains functions ready to be called from the views as well as calling functions from the models.

2.3.3 models

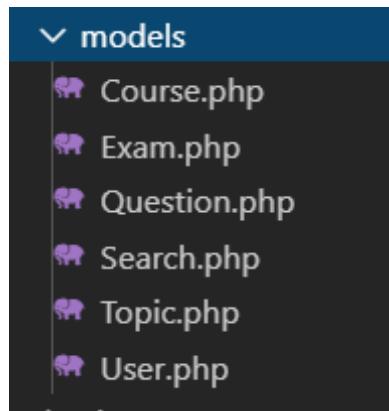


Figure 6: models folder

The models folder includes models, which contain SELECT, INSERT, UPDATE and DELETE queries to interact directly with database.

2.3.4 views

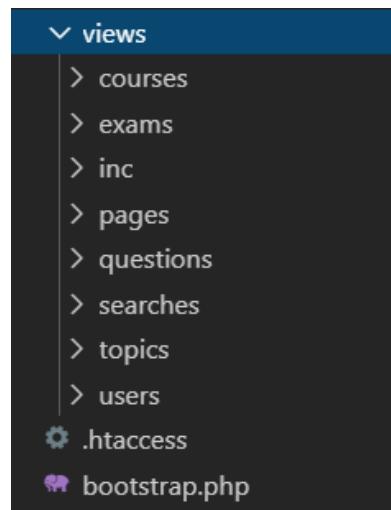


Figure 7: views folder

The views folder includes views, which is written in HTML. Each time, user send a http request from the view, the controller receives data, interacts with model, and render the view back for user.

3 QuizVerse Features

3.1 Guest User

3.1.1 View public pages

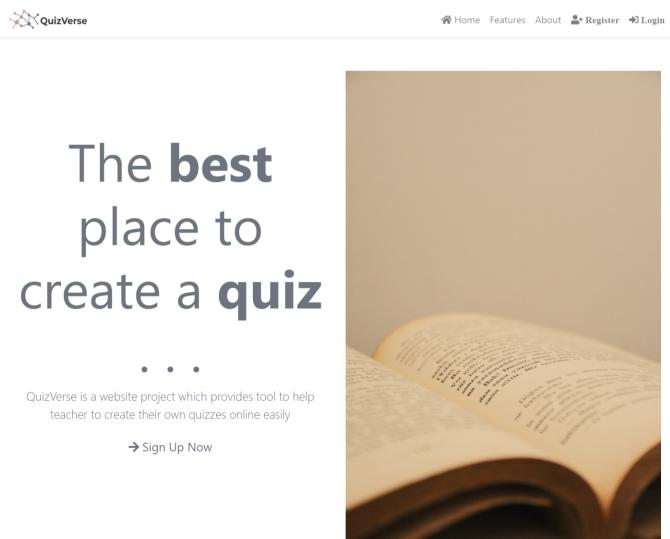


Figure 8: Guest Home Page

3.1.2 Register

The screenshot shows the 'Create An Account' form. It includes fields for First Name, Last Name, Lecturer ID, Email, Password, and Confirm Password. Below the form are 'Register' and 'Have an account? Login' buttons.

Figure 9: Register Page

3.1.3 Login

The screenshot shows the 'Login' form. It includes fields for Email and Password. Below the form are 'Login' and 'No account? Register' buttons.

Figure 10: Login Page

3.2 Lecturer

3.2.1 Dashboard

The screenshot shows the QuizVerse lecturer dashboard. On the left, there is a profile card for 'Barrack Obama' featuring his photo, name, and a list of details: Lecturer ID: 4, Industry Management, Ho Chi Minh University of Technology, obama@gmail.com, 0978776642, 1976-12-09. Below this are 'Edit profile' and 'Change Password' buttons. On the right, a list of courses is displayed under 'Public Courses': CO4027 - Software Engineering, CO5000 - Computer Network, and CO5027 - Advanced Machine Learning. Each course entry includes a preview icon, a link icon, and a red square icon.

Figure 11: Lecturer Dashboard

3.2.2 Edit profile

The screenshot shows the 'Edit Profile' page. It contains fields for First Name ('Barrack'), Last Name ('Obama'), Lecturer ID ('4'), Date Of Birth ('12/09/1976'), Phone Number ('0978776642'), Faculty ('Industry Management'), and an Avatar section with a 'Choose File' button ('No file chosen'). At the bottom is a 'Submit' button. The page also includes a 'Back' link, copyright information ('Copyright © 2019 QuizVerse designed by Nhan and Diep'), and links for 'Home', 'Features', 'About', 'Logout', and 'Have a Questions?'.

Figure 12: Edit Profile Page

3.2.3 Edit password

QuizVerse

Edit Password

Old Password: *

New Password: *

Confirm New Password: *

Submit

Have a Question?

Copyright © 2019 QuizVerse designed by Nhan and Diep

quiVERSE@hcmut.edu.vn
028 01642284289
268 Ly Thuong Kiet, District 10, Ho Chi Minh City, Viet Nam

Go Top

Figure 13: Change Password Page

3.2.4 Add / edit / delete courses

QuizVerse

Nhan Luong

Lecturer ID: #
Computer Science and Engineering
Ho Chi Minh University of Technology
nhan@gmail.com
0342575569
1995-04-21

Edit profile Change Password

Public Courses Private Courses

CO2013 - Database System

CO3005 - Principles of Programming Languages

CO3061 - Artificial Intelligence

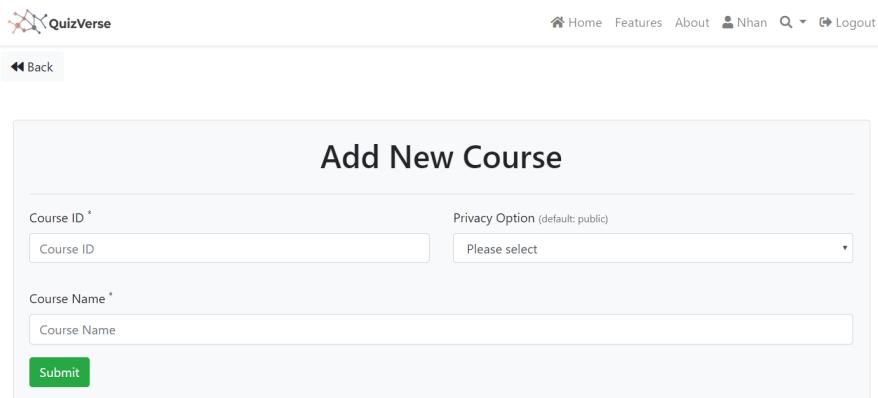
+ Add Course

Add course

View course Edit course Delete course

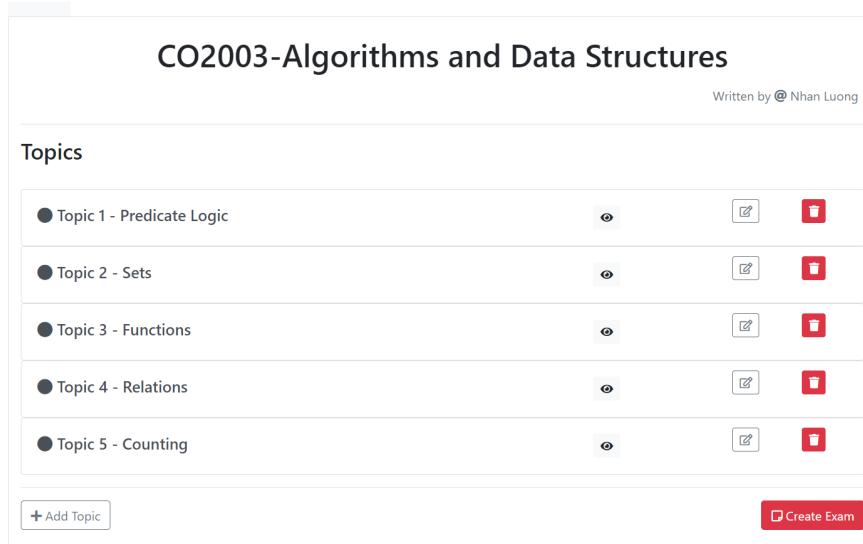
Figure 14: The dashboard after Lecturer login

After login, from the dashboard, Lecturer can view / add / edit / delete courses.



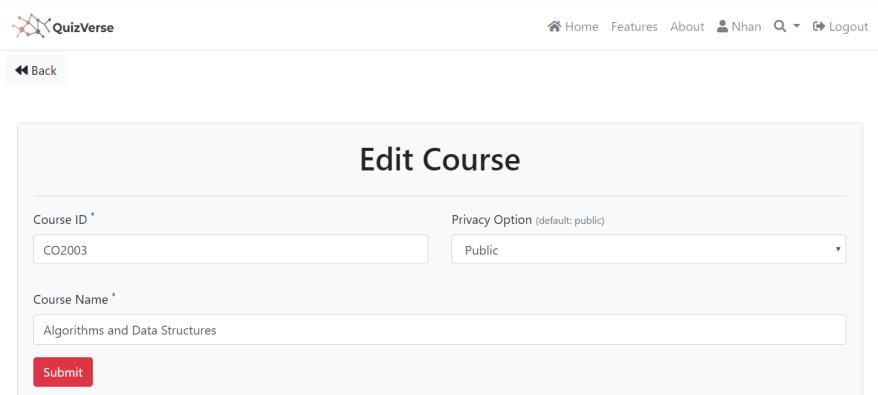
The screenshot shows the 'Add New Course' page of QuizVerse. At the top, there's a navigation bar with links for Home, Features, About, a user profile icon for Nhan, a search icon, and a Logout button. Below the navigation is a back button labeled 'Back'. The main title 'Add New Course' is centered at the top of the form. The form contains two input fields: 'Course ID *' and 'Course Name *'. To the right of the 'Course ID' field is a dropdown menu labeled 'Privacy Option (default: public)' with the option 'Please select' highlighted. A 'Submit' button is located at the bottom left of the form.

Figure 15: Add new course



The screenshot shows the 'CO2003-Algorithms and Data Structures' course page. The title is displayed at the top. Below it, a message says 'Written by @ Nhan Luong'. A 'Topics' section lists five topics: 'Topic 1 - Predicate Logic', 'Topic 2 - Sets', 'Topic 3 - Functions', 'Topic 4 - Relations', and 'Topic 5 - Counting'. Each topic has three icons: a pencil for editing, a magnifying glass for viewing details, and a trash can for deleting. At the bottom of the list are two buttons: '+ Add Topic' and 'Create Exam'.

Figure 16: View course contents



The screenshot shows the 'Edit Course' page for the CO2003 course. The title 'Edit Course' is at the top. The form includes fields for 'Course ID *' (set to CO2003) and 'Course Name *' (set to 'Algorithms and Data Structures'). To the right of the 'Course ID' field is a dropdown menu for 'Privacy Option (default: public)' with 'Public' selected. A 'Submit' button is at the bottom of the form.

Figure 17: Edit course information

3.2.5 Add / edit / delete topics

While reviewing contents of a course, lecturer can add / edit / delete topics and view topics contents (including questions)

The screenshot shows a list of topics under the heading "Topics". The topics are:

- Topic 1 - Predicate Logic
- Topic 2 - Sets
- Topic 3 - Functions
- Topic 4 - Relations
- Topic 5 - Counting

Each topic has three icons: a pencil icon for "Edit topic", a red square icon for "Delete topic", and a magnifying glass icon for "View questions". At the bottom left is a button "+ Add Topic" with a red arrow pointing to it labeled "Add more topic". At the bottom right is a red button "Create Exam" with a red arrow pointing to it labeled "Create Exam".

Figure 18: View course contents

The screenshot shows the "Add New Topic" form. It has two input fields: "Topic Title *" and "Topic Name *". Both fields have placeholder text "Topic Title" and "Topic Name" respectively. Below the fields is a green "Submit" button.

Figure 19: Add new topic

The screenshot shows the "Edit Topic" form. It displays the current values from the previous "Add New Topic" form: "Topic Title" is "Topic 1" and "Topic Name" is "Predicate Logic". Below the fields is a red "Submit" button.

Figure 20: Edit topic

Topic 1 - Predicate Logic

Written by @ Nhan Luong

Questions

Add Question

The repeating decimal number 3.14159265265265... written as a ratio of two integers a/b is:

Last modified 2019-12-11 10:46:45
Level: hard

A. 313845111/99990000
B. 313844841/99900000
C. 13845006/99990000
D. 13845106/99900000
E. 13845123/99000000

Figure 21: View topic contents

3.2.6 Add / edit / delete questions

Inside a topic, lecturer can add / edit / delete questions of that topic.

Topic 1 - Predicate Logic

Written by @ Nhan Luong

Questions

Add Question

The repeating decimal number 3.14159265265265... written as a ratio of two integers a/b is:

Last modified 2019-12-11 10:46:45
Level: hard

A. 313845111/99990000
B. 313844841/99900000
C. 13845006/99990000
D. 13845106/99900000
E. 13845123/99000000

Edit question Delete question

Figure 22: View questions inside topic

Add New Question

*Check on right answer, multiple answers are allowed

Question title goes here *

Option 1 *

Option 2 *

Option 3

Option 4

Option 5

Please select hard level *

Figure 23: Add question

Edit Question

*Check on right answer, multiple answers are allowed

The repeating decimal number 3.14159265265265... written as a ratio of two integers a/b is:

313845111/99990000

313844841/99900000

13845006/99990000

13845106/99900000

13845123/99000000

Hard

Figure 24: Edit question

3.2.7 Add / edit / delete exams

Lecturer can add exams from courses, and manage them in 'Review Exams'.



Create New Exam

Exam Title *

Description

Date taken *

 dd-----yyyy

Start time *

 00:00

Exam duration *

 minutes

Class:

Notes

Number of Questions *

Submit

Figure 25: Create new exam

Search questions

Topic: Please select

Question: Remember anything about the question title?

Hard level: Please select

Search

Questions List

The repeating decimal number 3.14159265265265... written as a ratio of two integers a/b is:

Last modified 2019-12-11 10:46:45
Level: hard

A. 313845111/99990000
B. 313844841/99900000
C. 13845006/99990000
D. 13845106/99900000
E. 13845123/99000000

Add **Remove**

Which of the following statements is true:

Last modified 2019-12-09 08:16:18
Level: medium

A. A number is rational if and only if its square is rational
B. An integer n is odd if and only if $n^2 + 2$ n is odd
C. A number is irrational if and only if its square is irrational
D. A number n is odd if and only if $n(n+1)$ is even
E. At least one of two numbers x and y is irrational if and only if the product xy is irrational

Add **Remove**

Figure 26: Add / remove questions for exam

Nhan Luong

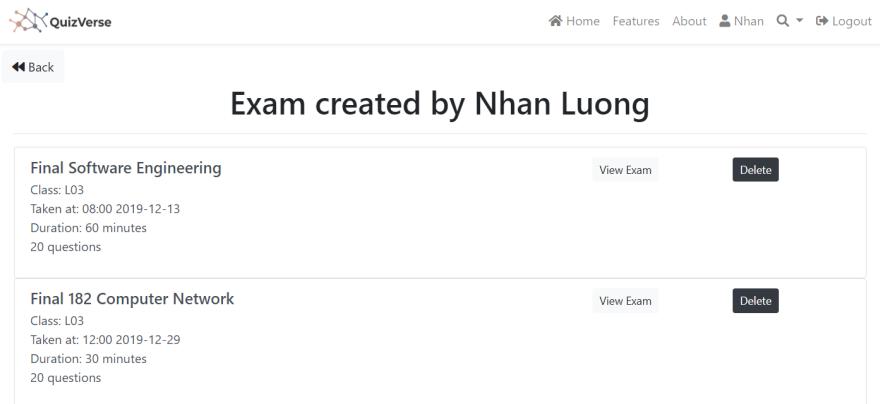
Review Exams **+ Add Course**

Public Courses Private Courses

CO2003 - Algorithms and Data Structures

CO3045 - Web Programming

Figure 27: Review exams from dashboard



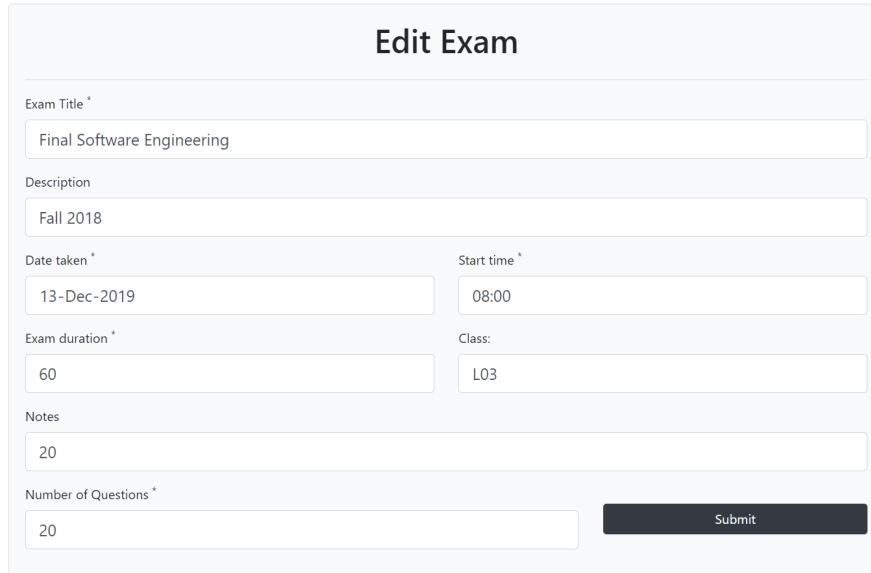
Final Software Engineering
Class: L03
Taken at: 08:00 2019-12-13
Duration: 60 minutes
20 questions

View Exam Delete

Final 182 Computer Network
Class: L03
Taken at: 12:00 2019-12-29
Duration: 30 minutes
20 questions

View Exam Delete

Figure 28: Review Exams Page



Exam Title *
Final Software Engineering

Description
Fall 2018

Date taken *
13-Dec-2019

Start time *
08:00

Exam duration *
60

Class:
L03

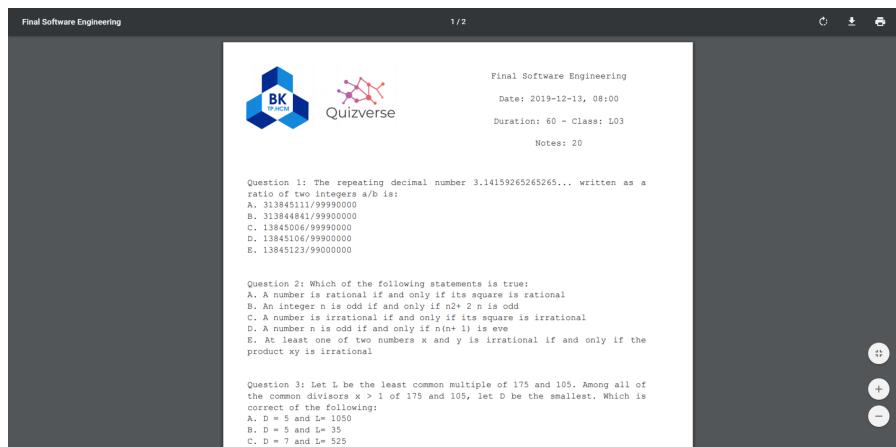
Notes
20

Number of Questions *
20

Submit

Figure 29: Edit Exam description

3.2.8 Export exam in PDF



Final Software Engineering

Final Software Engineering
Date: 2019-12-13, 08:00
Duration: 60 - Class: L03
Notes: 20

Question 1: The repeating decimal number $3.14159265265\ldots$ written as a ratio of two integers a/b is:
A. $31484159265265/1000000000000000$
B. $318484159265265/1000000000000000$
C. $13845006/99990000$
D. $13845106/99900000$
E. $13845123/99000000$

Question 2: Which of the following statements is true:
A. A number is rational if and only if its square is rational
B. An integer n is odd if and only if n^2 is odd
C. A number is irrational if and only if its square is irrational
D. A number is odd if and only if $n(n-1)$ is even
E. At least one of two numbers x and y is irrational if and only if the product xy is irrational

Question 3: Let L be the least common multiple of 175 and 105. Among all of the common divisors $x > 1$ of 175 and 105, let D be the smallest. Which is correct of the following:
A. $D = 5$ and $L = 105$
B. $D = 5$ and $L = 35$
C. $D = 7$ and $L = 125$
D. $D = 7$ and $L = 105$

Figure 30: Export Exam in PDF

3.2.9 Search users / courses / questions

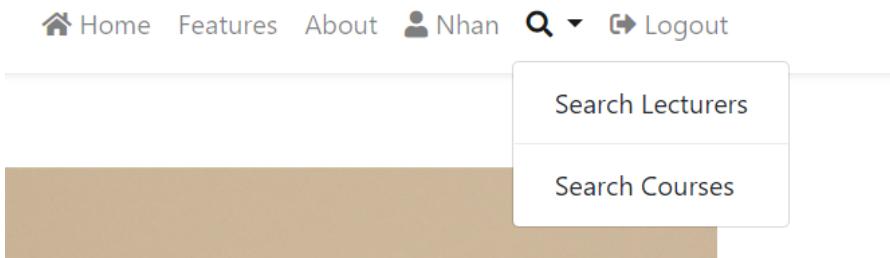


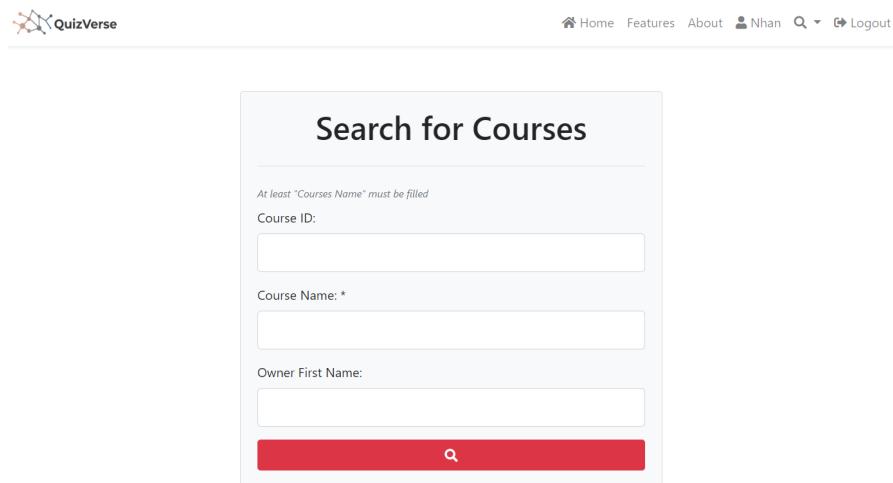
Figure 31: Search Panel

A screenshot of a search form titled 'Search for Lecturers'. The form has three input fields: 'First Name: *' (with an error message 'At least First Name must be filled'), 'Email Address:', and 'Lecturer ID:'. Below the fields is a large red search button with a white magnifying glass icon.

Figure 32: Search for Lecturer

A screenshot of a search results page. The title is 'Search results' and it says 'For Lecturer Fristname: do'. It shows a result for 'Donald Trump' with a small profile picture, email (trump@gmail.com), lecturer ID (5), and faculty (Faculty of Chemical Engineering). There is a back button and a refresh/clear button at the top right.

Figure 33: Search result



The screenshot shows a search form titled "Search for Courses". It includes fields for "Course ID", "Course Name: *", and "Owner First Name". A red search button with a magnifying glass icon is at the bottom.

At least "Courses Name" must be filled

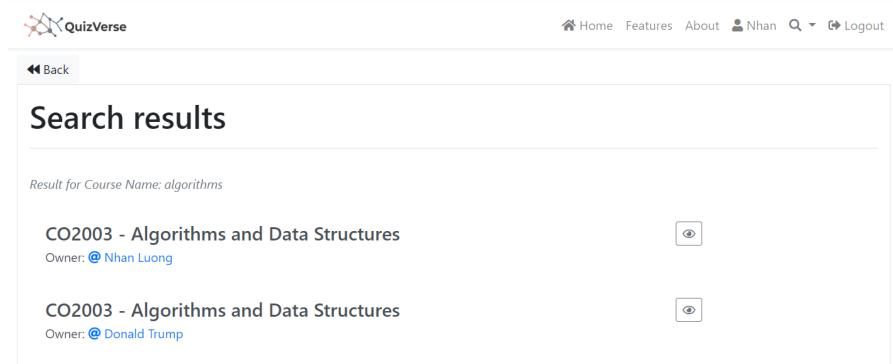
Course ID:

Course Name: *

Owner First Name:

🔍

Figure 34: Search for Course



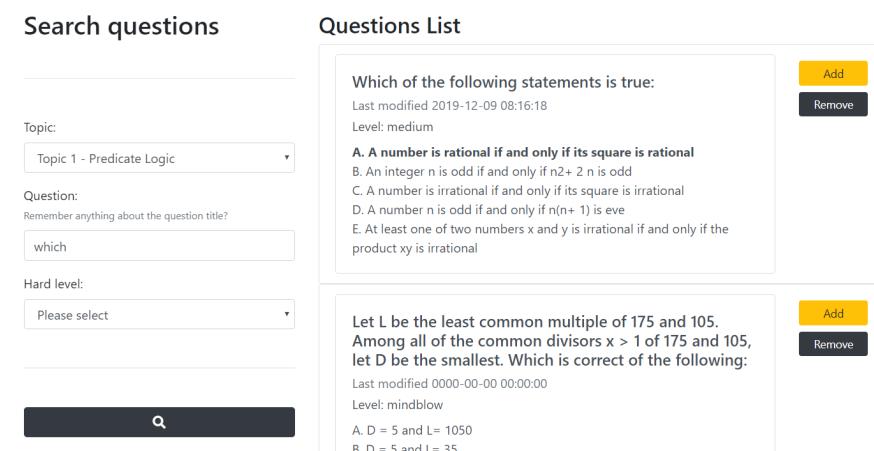
The screenshot shows search results for the course name "algorithms". Two entries are listed: "CO2003 - Algorithms and Data Structures" owned by Nhan Luong and "CO2003 - Algorithms and Data Structures" owned by Donald Trump. Each entry has a view icon.

Result for Course Name: algorithms

CO2003 - Algorithms and Data Structures
Owner: [@ Nhan Luong](#)

CO2003 - Algorithms and Data Structures
Owner: [@ Donald Trump](#)

Figure 35: Search result



The screenshot shows a search form for questions and a list of questions. The search form includes fields for "Topic", "Question", and "Hard level", with a red search button at the bottom. The question list shows two entries: one about rational numbers and another about the least common multiple of 175 and 105, each with an "Add" and "Remove" button.

Search questions

Topic: Topic 1 - Predicate Logic

Question: Remember anything about the question title? which

Hard level: Please select

Questions List

Which of the following statements is true:
Last modified 2019-12-09 08:16:18
Level: medium

A. A number is rational if and only if its square is rational
B. An integer n is odd if and only if $n^2 + 2$ n is odd
C. A number is irrational if and only if its square is irrational
D. A number n is odd if and only if $n(n+1)$ is even
E. At least one of two numbers x and y is irrational if and only if the product xy is irrational

Add Remove

Let L be the least common multiple of 175 and 105.
Among all of the common divisors x > 1 of 175 and 105, let D be the smallest. Which is correct of the following:
Last modified 0000-00-00 00:00:00
Level: mindblow

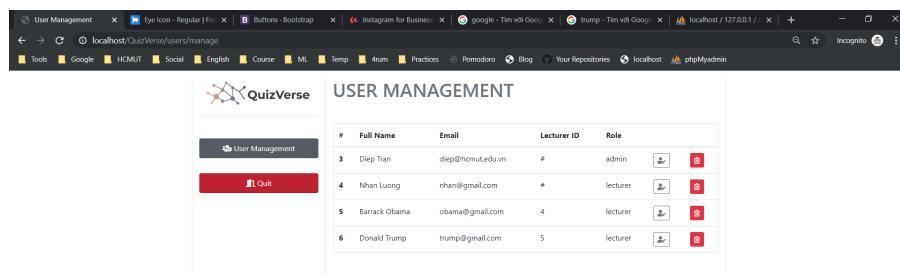
A. D = 5 and L = 1050
B. D = 5 and L = 35

Add Remove

Figure 36: Search questions

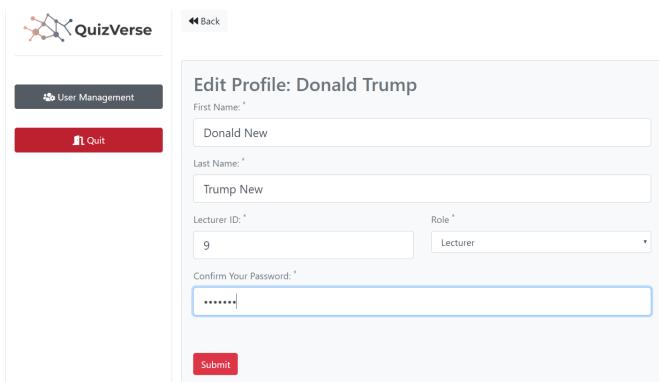
3.3 Admin

3.3.1 Manage (edit/delete) users



#	Full Name	Email	Lecturer ID	Role	Actions
3	Diep Tran	diep@hcmut.edu.vn	#	admin	 
4	Nhan Luong	nhan@gmail.com	#	lecturer	 
5	Barrack Obama	obama@gmail.com	4	lecturer	 
6	Donald Trump	trump@gmail.com	5	lecturer	 

Figure 37: User Management



The screenshot shows the 'Edit Profile' form for 'Donald Trump'. The fields are as follows:

- First Name: Donald New
- Last Name: Trump New
- Lecturer ID: 9
- Role: Lecturer
- Confirm Your Password: (redacted)

At the bottom is a 'Submit' button.

Have a Questions?

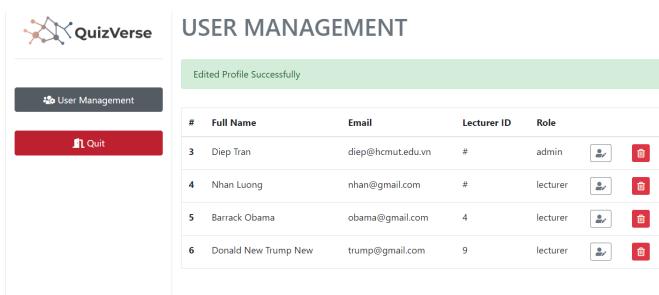
✉ quizverse@hcmut.edu.vn

📞 028 01642284289

📍 268 Ly Thuong Kiet, District 10, Ho Chi Minh City, Viet Nam

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Nhan and Diep

Figure 38: Edit User



The screenshot shows the 'USER MANAGEMENT' page with a green success message 'Edited Profile Successfully' at the top. The user list table is identical to Figure 37, showing the updated profile for Donald Trump.

Figure 39: Edit User Result

The screenshot shows a web application titled "USER MANAGEMENT" from "QuizVerse". On the left, there's a sidebar with "User Management" and a "Quit" button. The main area has a green header bar that says "User Deleted". Below it is a table with columns: #, Full Name, Email, Lecturer ID, and Role. The table contains three rows:

#	Full Name	Email	Lecturer ID	Role
3	Diep Tran	diep@hcmut.edu.vn	#	admin
4	Nhan Luong	nhan@gmail.com	#	lecturer
5	Barrack Obama	obama@gmail.com	4	lecturer

Each row has edit and delete icons.

Figure 40: Delete User Result

4 How To Install

This web application runs on XAMPP for Windows 7.3.12 (PHP version 7.3.12)

- step 1: Install XAMPP at <https://www.apachefriends.org/index.html>.
- step 2: Copy folder "QuizVerse" to XAMPP webroot.
- step 3: Open XAMPP Control Panel.
- step 4: Run Apache and MySQL.
- step 5: Open browser and enter localhost/phpmyadmin to access PHPmyadmin.
- step 6: Import "quizverse.sql" to MySQL database.
- step 7: Open browser and enter localhost/QuizVerse to run web application.

User Tabular:

Email	Password	Role
diep@hcmut.edu.vn	1234567	admin
nhan@gmail.com	123456	lecturer
obama@gmail.com	123456	lecturer
trump@gmail.com	123456	lecturer

5 Group Work Distribution

Student Name	Task	Performance
Tran Thi Ngoc Diep	Half of all works*	100%
Luong Thanh Nhan	Half of all works*	100%

(*) Both members take part in every works

6 Conclusion

In this assignment, we have already completed almost basic requirements as the assignment requires.