

CS 492 Senior Design Project

Final Report



QANDA

Students:

Ulugbek Irmatov

Solehjon Ruziboev

Ridvan Celik

Supervisor:

Ugur Dogrusoz

Jury:

Ciğdem Gündüz Demir

Fazli Can

May 3, 2018

Table of Contents

1 Introduction	3
2 Final Architecture and Design	3
2.1 System Overview	3
2.2 System Architecture	4
2.2.1 Client	4
2.2.2 Controller	7
2.2.3 Model	11
3 Tools and Technologies	15
4 Innovation and Creativity	15
5 Impact of Engineering Solutions	15
5.1 Global Impact	16
5.2 Social Impact	16
5.3 Economic Impact	16
6 Contemporary Issues	18
6.1 Buy and Sell Feature Not Controlled	18
6.2 Inappropriate Use of Language	18
7 Conclusion	19
8 Glossary	20
User's Manual	21
Pages	21
Question Page:	21
Online Resources Page:	23
Tutorship Page:	25
Teacher Rating Page:	28
Buy and Sell Page:	32
Filtering	35
Searching	36
Members and Guests	37
Announcements	37
References	37

1 Introduction

QANDA is stackoverflow-like question and answer platform for Bilkent courses. In addition to Q&As it has other features. Users can find useful online resources for courses. They can post advertisements for tutorships. They can also post buy and sell items. Users can rate teachers available in teacher ratings list. Using search they can reach any available post in the application. They can filter list of items by course codes. There is also announcements section that can feature posters such as May Fest.

2 Final Architecture and Design

2.1 System Overview

We built the application using MERN stack. MongoDB as database, Express.js is backend framework on Node.js environment and React.js is used at frontend.

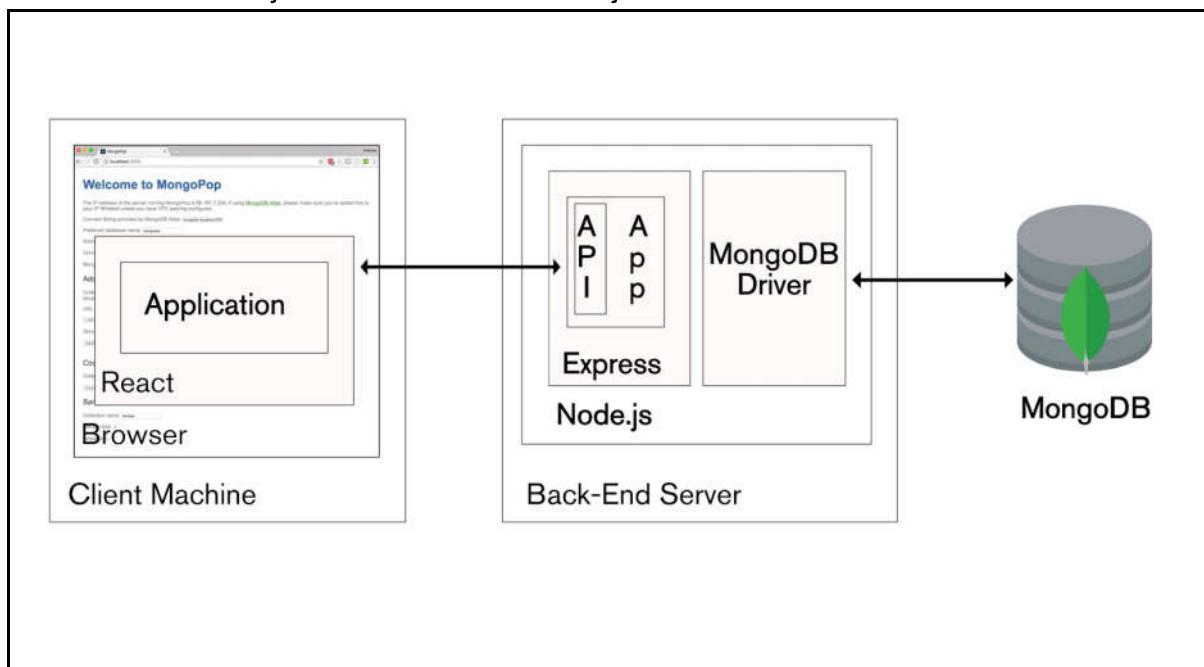


Figure 1 Final System Architecture [1]

2.2 System Architecture

In this section, we will explain each part of the system in detail.

2.2.1 Client

We wrote client side in React. In this part, we will show each page and their respective components in detail. Together with React, we also used Redux library for state management in application. So, each page has its own Redux action and reducer. Each component extends React's Component class.

PostListPage
This page lists all the questions or filtered questions according to state of the application. On this page you can post new questions as well.
Components
PostSheet component; PostCreateWidget component; PostList component; PostItem component;

Figure 2 PostListPage

PostDetailPage

This page shows all the answers a particular question has. You can answer the question on this page.

Components

AnswerPaperSheet component;
CreateAnswerWidget component;
AnswerList component;
AnswerItem component;

Figure 3 PostDetailPage

BuyAndSellListPage

This page shows listing of advertisements for buy and sell items. You can post an advertisement as well.

Components

BuyAndSellItem component;
BuyAndSellWidget component;
BuyAndSellList component;

Figure 4 BuyAndSellPage

TutorshipListPage

This page displays list of posts related to tutorship. It is one of the five main pages.

Components

TutorshipItem

TutorshipList

TutorshipWidget

Figure 5 TutorshipListPage

OnlineResourceListPage

This page shows all the online resource listings. You can post new online resource as well.

Components

OnlineResourceItem component;

OrPaperSheet component;

OnlineResourceWidget component;

OnlineResourceList component;

Figure 6 OnlineResourceListPage

TeacherRatingsListPage

This page shows list of teacher ratings. You can rate each teacher on this list.

Components

TeacherRatingsList component;

TeacherRatingsItem component;

TeacherRatingsWidget component;

Figure 7 TeacherRatingsListPage

TeacherRatingsDetailPage

This page shows profile of a teacher in detail. You can rate each teacher on this list.

Components

TeacherRatingCommentWidget

TeacherRatingCommentList

TeacherRatingComment

Figure 8 TeacherRatingsDetailPage

2.2.2 Controller

In server side we created Express.js controllers for models.

post.controller

This controller manages saving and retrieving of questions in the database.

Methods

getPosts(req,res) : Retrieves questions from the database.

addPost(req,res) : Saves question to database.

getPost(req,res) : Retrieves a question with given id.

Figure 9 post.controller

answer.controller

This controller manages saving and retrieving answers in database.

Methods

getAnswers(req,res) : Retrieves all answers from database.

addAnswer(req,res) : Saves an answer in the database.

getAnswer(req,res) : Retrieves an answer with given id.

Figure 10 answer.controller

buyandsell.controller

This controller handles saving and retrieving of buy and sell items in database.

Methods

getBuyAndSellItems(req,res) : Retrieves buy and sell items from database.

addBuyAndSellItem(req, res) : Saves buy and sell item in database.

getBuyAndSellItem(req,res) : Retrieves buy and sell item with given id.

Figure 11 buyandsell.controller

onlineresource.controller

This controller handles saving and retrieving of online resource items in database.

Methods

getOnlineResources(req, res) : Retrieves online resource items from database.

addOnlineResource(req,res) : Saves an online resource in database.

getOnlineResource(req,res) : Retrieves an online resource with given id.

Figure 12 onlineresource.controller

user.controller

This controller handles user authentication and updating user profile information.

Methods

register(req,res) : Registers a user or gives error if user with given name exists.

login(req,res) : Handles user login.

updateUserInfo(req,res) : Updates user's profile information.

Figure 13 user.controller

teacherrating.controller

This controller handles saving and retrieving teacher ratings in database.

Methods

getTeacherRatings(req,res) : Retrieves teacher ratings from database.

addTeacherRating(req,res) : Saves teacher rating to database.

getTeacherRating(req,res) : Retrieves teacher rating with given id.

Figure 14 teacherrating.controller

trcomment.controller

This controller handles saving and retrieving of teacher rating comments in database.

Methods

getTrComments(req,res) : Retrieves teacher rating comments from database.

addTrComment(req,res) : Saves teacher rating comment to database.

getTrComment(req,res) : retrieves a teacher rating comment wit given id.

Figure 15 trcomment.controller

tutorship.controller

This controller handles saving and retrieving of tutorship items in database.

Methods

getTutorships(req,res) : Retrieves tutorship items from database.

addTutorship(req,res) : Saves tutorship item to database.

getTutorship(req,res) : Retrieves tutorship item with given id.

Figure 16 tutorship.controller

2.2.3 Model

This part includes all MongoDB schema models used in the application.

post

Question model

Properties

String[] tags;

String title;

String content;

String slug;

String cuid:

Date dateAdded;

Figure 17 post

answer

Answer model

Properties

String[] tags;

String title;

String content:

String slug;

String cuid:

Date dateAdded;

Figure 18 answer

buyandsell

Buy and Sell model

Properties

String[] tags;

String title;

String content;

Number price;

String contact;

String slug;

String cuid;

Date dateAdded;

Figure 19 buyandsell

onlineresouce

Online Resource model

Properties

```
String[] tags;  
String title;  
String content;  
String link;  
String slug;  
String cuid;  
Date dateAdded;
```

Figure 20 onlineresource

teacherrating

Teacher Rating model

Properties

```
String[] tags;  
String name;  
Number grading;  
Number teaching;  
Number workload;  
String slug;  
String cuid;  
Date dateAdded;
```

Figure 21 teacherrating

trcomment

Teacher Rating Comment model

Properties

String content;

String cuid;

String teacher;

Date dateAdded;

Figure 22 trcomment

tutorship

Tutorship model

Properties

String title;

String content;

String type;

String slug;

String cuid;

Date dateAdded;

Figure 23 tutorship

user
User model
Properties
String username; String password; Date dateAdded;

Figure 24 user

3 Tools and Technologies

React Developer Tools: Browser extension useful when debugging react code. Shows properties of react components that's not available in browser's default HTML inspector. [2]

Redux Developer Tools: Browser extension that shows redux actions and state snapshots in time to help debugging. [3]

MongoDB Compass: Desktop application for MongoDB database management.[4]

Visual Studio Code: Light-weight hybrid text editor with handy git conflict resolver and several cool add-ons. [5]

Sublime Text 3: The text editor which installs all the needed packages for the best experience using a package manager. [6]

Google Chrome: A web-browser used for running the application locally in windows.

Mozilla Firefox : A web-browser used for running the application locally in ubuntu.

Yarn: Package manager. [7]

Webpack: Module bundler. [8]

Git: Version Control System.

Bootstrap: UI library. [9]

4 Innovation and Creativity

QANDA is a unique mashup of its kind. It's the combination of various previously used by students tools from facebook, quora and facebook. The most useful part of the application is that it filters it out by course codes and thus allow student to search easily through the website for the needed information about the course, teachers and others. There is no such application currently in the modern industry for the students. That's what makes it unique and creative.

5 Impact of Engineering Solutions

QANDA's engineering solutions will be considered in perspective of global, social and economical impact.

5.1 Global Impact

QANDA is a q/a platform which includes a variety of features. The aspect that makes different QANDA from other web applications is that its audience is targeted to be students. Each post is associated with some specific course or courses. Therefore, students can find all the information needed regarding a course just by selecting that course in filter section and everything will be filtered out according to the option. Currently, the application is targeted only for Bilkent University, and thus bilkent students, however implementing this application for other universities is not challenging. Students from all over the world could use this application and easen some important aspect of college life. This includes teacher choice, course research, course material purchase and tutorship help.

5.2 Social Impact

QANDA is built for Bilkent University and its students. Before this app students, in the beginning of each semester would spend hours or even days on instructor research to understand which one is a better fit for their individuality. In order to buy course material students would spend a lot of money, for some that might be challenging, If somebody doesn't understand the course material it would be hard to ask for help unless you have a friend who can help out. They also are spending a lot of time to find some resources other

than course book to study from. Now with QANDA students can solve all the above problems with a few clicks.

5.3 Economic Impact

It is worth mentioning that all the features and the whole website is available for free. However, as almost all other ‘web’ companies do, we implemented some ways so that the app can make profit.

In the right side of the QANDA there is a section Announcements. This is the place where it can make some profit and cause an economic impact. Since, the application’s main audience is students the announcements will be all college related such that it’s interesting for students. Regarding the user base of application, it almost guarantees to be relatively big. There is no such an application targeted for student in the modern industry. Additionally, from section 5.1 and 5.2 it proves to be useful and have both social and global impact.

6 Contemporary Issues

QANDA and its design does not read what kind of inputs are entered and updated in the database. This issue might be used by students intending to sell homeworks, projects or etc...

6.1 Buy and Sell Feature Not Controlled

The Buy and Sell Feature of QANDA is designed to provide students less expensive course materials so that both can benefit. In this way no books or materials needed for other students are wasted.

The problem might arise when students will use this feature to buy and sell homeworks, project or assignments in general. The system does not control what comes in to the database and thus students can post anything in this section and not only this feature which leads to more another issue.

6.2 Inappropriate Use of Language

The main purpose of QANDA is to provide free web platform for exchange of data. The data is controlled by the service. This has a positive side that students can express themselves in a free way and thus the responses and data is more or less guaranteed to be correct.

The negative side of such free expression is the inappropriate use of language. People might start to be aggressive in comment, even though it's less likely since students are already young and educated adults. This problem might negatively affect all the participants of the web app as people might get irritated by these comments and leave the website.

7 Conclusion

This report finalized the final architecture and design. It explained in detail the system architecture and each of the main components client, controller and model in a detailed way. Then all the tools and technologies used in this project were explained. Impact of engineering solution in terms of global, social and environmental aspects were considered. Finally, contemporary issues were discussed.

QANDA is a platform for data sharing, or more specifically an Q/A platform which includes features like, online resources, tutorship, teacher ratings and buy and sell. As a whole this project is a mash-up of different ideas and tools that students were already using. This project was designed and developed for the main purpose of making students life a lot easier and better.

All the features of the proposed project were accomplished. This includes the integration of authorization system, integration of a powerful search engine in the face of algolia and the integration of filters by course codes. Other main features like add, post, update were also successfully achieved. The UI polishing also was successfully completed.

8 Glossary

ReactJS - UI library created by Facebook.

Component - a React class. In React, UI is divided in components.

Online Resource - The resource of any type such as link, pdf, file, video or whatever else related to the course which might be useful to students.

Announcements - The news or events which are important to students.

Rating form - the form which includes most crucial features of teachers to rate from 1 to 10.

Course Materials - component/section for buy/sell of course materials such as books, notes or devices.

Yarn - Yarn is a package manager for your code. It allows you to use and share code with other developers from around the world.

Webpack - Webpack is used to compile JavaScript modules.

User's Manual

Pages

Question Page:

In the left side of the screen you will see five different buttons to link for related pages. The first button “Questions” is the default as home page where users are able to post questions after they log in. If you click any question, you are able to answer that question also see other answers too.

The screenshot shows the QANDA Home Question Page. The top navigation bar includes "QANDA Home", a search bar, and "Register / Login" buttons. On the left, there's a sidebar with links for "Questions", "Online Resources", "Tutorship", "Teacher Ratings", and "Buy and Sell". Below this is a "Filter By Tags" section with a dropdown menu set to "Select...". The main content area displays a list of questions:

- When to use single quotes, double quotes, and back ticks in MySQL** (2018-05-07)
I am trying to learn the best way to write queries. I also understand the importance of being consistent. Until now, I have randomly used single quotes, double quotes, and back ticks without any real thought. Example: \$query = 'INSERT INTO table (id, col1, col2) VALUES (NULL, val1, val2)'; Also, in the above example, consider that "table," "col[n]," and "val[n]" may be variables. What is the standard for this? What do you do?
- What is a NullPointerException, and how do I fix it?** (2018-05-07)
What are Null Pointer Exceptions (java.lang.NullPointerException) and what causes them? What methods/tools can be used to determine the cause so that you stop the exception from causing the program to terminate prematurely?
- Is PHP Object-Oriented Language?** (2018-05-07)
Is PHP an object-oriented language? If not, then what about the framework CakePHP? Is it an object-oriented MVC implementation of PHP? Also, can a PHP application wholly built using classes be called object-oriented?
- Why such courses?** (2018-05-07)
I'm a freshman in Bilkent. I just looked at our curriculum and I got a little surprised. I thought Computer Engineering in Bilkent is all about software. However courses like Digital Desing, Computer Organization and Operating Systems prove me wrong. I want to be a software developer do and have no interest in hardware. Do you think I should switch to CTIS?
- CS Department** (2018-05-07)
Do you have any suggestions on what should I take as my elective courses? The thing is I'm not really sure which sphere I like so I'm a little confused. If you could explain you experiences it would help. Thanks.
- First Semester** (2018-05-07)
How Do I Finally Pass The Course. I've tried everything but it just seems that I will never be computer engineer. Any help appreciated.

A sidebar on the right lists "Announcements" with items like "SPORT NEWS", "GITHUB", "BOOTSTRAP", "LINKEDIN", "GOOGLE", "HUGHUGSY", "z-e-r-0", and "SOLEH23".

Figure 26: Question Page where user didn't login

QANDA Home

Questions

Online Resources

Tutorship

Teacher Ratings

Buy and Sell

Filter By Tags

Select... ▼

Are you looking for online answers? just post here if you did not find POST

Search 🔍

[When to use single quotes, double quotes, and back ticks in MySQL](#) 2018-05-07

I am trying to learn the best way to write queries. I also understand the importance of being consistent. Until now, I have randomly used single quotes, double quotes, and back ticks without any real thought. Example: \$query = 'INSERT INTO table (id, col1, col2) VALUES (NULL, val1, val2)'; Also, in the above example, consider that "table," "col[n]," and "val[n]" may be variables. What is the standard for this? What do you do?

[Announcements](#)

[SPORT NEWS](#)

[GITHUB](#)

[BOOTSTRAP](#)

[LINKEDIN](#)

[GOOGLE](#)

[HUGHUGSY](#)

[z-e-r-0](#)

[SOLEH23](#)

[What is a NullPointerException, and how do I fix it?](#) 2018-05-07

What are Null Pointer Exceptions (java.lang.NullPointerException) and what causes them? What methods/tools can be used to determine the cause so that you stop the exception from causing the program to terminate prematurely?

[Is PHP Object-Oriented Language?](#) 2018-05-07

Is PHP an object-oriented language? If not, then what about the framework CakePHP? Is it an object-oriented MVC implementation of PHP? Also, can a PHP application wholly built using classes be called object-oriented?

[Why such courses?](#) 2018-05-07

I'm a freshman in Bilkent. I just looked at our curriculum and I got a little surprised. I thought Computer Engineering in Bilkent is all about software. However courses like Digital Desing, Computer Organization and Operating Systems prove me wrong. I want to be a software developer do and have no interest in hardware. Do you think I should switch to CTIS?

[CS Department](#) 2018-05-07

Do you have any suggestions on what should I take as my elective courses? The thing is I'm not really sure which sphere I like so I'm a little confused. If you could explain you experiences it would help. Thanks.

[First Semester](#) 2018-05-07

How Do I Finally Pass The Course. I've tried everything but it just seems that I will never be computer engineer. Any help appreciated.

Figure 26: Question page with logged in user

Online Resources Page:

We also offer sharing online resources to users. These resources can be link, document or text. In addition, while posting an online resource you can select tags, and other users easily find your post by searching.

The screenshot shows the QANDA Home page with a question detail page overlaid. The top navigation bar includes 'QANDA Home', a search bar, and 'Profile' and 'Logout' buttons. On the left, a sidebar lists 'Questions', 'Online Resources', 'Tutorship', 'Teacher Ratings', and 'Buy and Sell'. Below it is a 'Filter By Tags' section with a dropdown menu. The main content area displays a question titled 'When to use single quotes, double quotes, and back ticks in MySQL'. The question text discusses the importance of consistency in quoting SQL queries. It includes three answers, each with a timestamp: 'nice post' (Date Added: 2018-05-07), a detailed explanation of PHP string handling (Date Added: 2018-05-07), and a note about MySQL identifier quoting rules (Date Added: 2018-05-07). To the right, a sidebar lists various announcements and user profiles: SPORT NEWS, GITHUB, BOOTSTRAP, LINKEDIN, GOOGLE, HUGHUGSY, z-e-r-0, and SOLEH23.

When to use single quotes, double quotes, and back ticks in MySQL

I am trying to learn the best way to write queries. I also understand the importance of being consistent. Until now, I have randomly used single quotes, double quotes, and back ticks without any real thought. Example: \$query = 'INSERT INTO table (id, col1, col2) VALUES (NULL, val1, val2)'; Also, in the above example, consider that 'table' and 'val[n]' may be variables. What is the standard for this? What do you do?

ANSWER

Comment Section

nice post

— Date Added: 2018-05-07

So if your string contains single quotes, then you could use double quotes to quote the string, or if it contains double quotes, then you could use single quotes to quote the string. But if your string contains both single quotes and double quotes, you need to escape the one that used to quote the string. Mostly, we use single quotes for an SQL string value, so we need to use double quotes for a PHP string.

— Date Added: 2018-05-07

Perhaps it is important to mention that PHP handles single and double quoted strings differently... Single-quoted strings are 'literals' and are pretty much WYSIWYG strings. Double-quoted strings are interpreted by PHP for possible variable-substitution (backticks in PHP are not exactly strings; they execute a command in the shell and return the result).

— Date Added: 2018-05-07

457 down vote accepted Backticks are to be used for table and column identifiers, but are only necessary when the identifier is a MySQL reserved keyword, or when the identifier contains whitespace characters or characters beyond a limited set (see below) It is often recommended to avoid using reserved keywords as column or table identifiers when possible, avoiding the quoting issue. Single quotes should be used for string values like in the VALUES() list. Double quotes are supported by MySQL for string values as well, but single quotes are more widely accepted by other RDBMS, so it is a good habit to use single quotes instead of double. MySQL also expects DATE and DATETIME literal values to be single-quoted as strings like '2001-01-01 00:00:00'. Consult the Date and Time Literals documentation for more details, in particular alternatives to using the hyphen - as a segment delimiter in date strings. So using your example, I would double-quote the PHP string and use single quotes on the values 'val1', 'val2'. NULL is a MySQL keyword, and a special (non-)value, and is therefore unquoted. None of these table or column identifiers are reserved words or make use of characters requiring quoting, but I've quoted them anyway with backticks (more on this later...). Functions native to the RDBMS (for example, NOW() in MySQL) should not be quoted, although their arguments are subject to the same string or identifier quoting rules already mentioned.

— Date Added: 2018-05-07

Figure 27 : Question Detail Page

QANDA Home

Search Register Login

Questions	How To Read Files in Java Link: Click Here Description: Reading Files in Java made Easy Date: 2018-05-07	C++ Tutorial Link: Click Here Description: Bucky Roberts or other known by thenewboston, very good strataff with C++ Date: 2018-05-07	Handling Uni Stress Link: Click Here Description: Probably the best source out there for calming down a little bit and getting a little bit away from the stress. Date: 2018-05-07	Announcements
Online Resources	Automata Theory Lecture Notes Link: Click Here Description: Automate Theory Lecture Notes from Fall 2017 Bilkent University Date: 2018-05-07	Java Documentation Link: Click Here Description: This document helps to get started for freshmen with Java. You have to get used to reading docs. Start now. Date: 2018-05-07	Description of Course Link: Click Here Description: Brief course description helps you get an idea what the course is about Date: 2018-05-07	SPORT NEWS
Tutorship	Assembly Tutorial Link: Click Here Description: Usually students are having trouble learning assembly. So here's the tutorial which will hopefully you Date: 2018-05-07			GITHUB
Teacher Ratings				BOOTSTRAP
Buy and Sell				LINKEDIN
Filter By Tags				GOOGLE
Select... <input type="button"/>				HUGHUGSY
				z-e-r-0
				SOLEH23

Figure :28 Online Resource Page where user didn't login

QANDA Home

Search Profile Logout

Questions	Are you looking for online resources? Or do you want to share?			POST	Announcements
Online Resources	How To Read Files in Java Link: Click Here Description: Reading Files in Java made Easy Date: 2018-05-07	C++ Tutorial Link: Click Here Description: Bucky Roberts or other known by thenewboston, very good strataff with C++ Date: 2018-05-07	Handling Uni Stress Link: Click Here Description: Probably the best source out there for calming down a little bit and getting a little bit away from the stress. Date: 2018-05-07	SPORT NEWS	
Tutorship	Automata Theory Lecture Notes Link: Click Here Description: Automate Theory Lecture Notes from Fall 2017 Bilkent University Date: 2018-05-07	Java Documentation Link: Click Here Description: This document helps to get started for freshmen with Java. You have to get used to reading docs. Start now. Date: 2018-05-07	Description of Course Link: Click Here Description: Brief course description helps you get an idea what the course is about Date: 2018-05-07	GITHUB	
Teacher Ratings	Assembly Tutorial Link: Click Here Description: Usually students are having trouble learning assembly. So here's the tutorial which will hopefully you Date: 2018-05-07			BOOTSTRAP	
Buy and Sell				LINKEDIN	
Filter By Tags				GOOGLE	
Select... <input type="button"/>				HUGHUGSY	
				z-e-r-0	
				SOLEH23	

Figure 29: Online Resource page with logged in user

The screenshot shows the QANDA Home page with a sidebar on the left containing links for Questions, Online Resources, Tutorship, Teacher Ratings, and Buy and Sell. Below these is a 'Filter By Tags' section with a dropdown menu set to 'Select...'. The main content area displays an online resource titled 'How To Read Files in Java' with a description: 'Reading Files in Java made Easy' and a full link: <https://www.mkyong.com/java/how-to-read-file-in-java-fileinputstream/>. A blue button labeled 'Go to Online Resources' is present. The date 'Date: 2018-05-07' is also shown. On the right side, there is a vertical sidebar with colored boxes for Announcements, including 'SPORT NEWS' (blue), 'GITHUB' (green), 'BOOTSTRAP' (light blue), 'LINKEDIN' (blue), 'GOOGLE' (light blue), 'HUGHUGSY' (green), 'z-e-r-0' (green), and 'SOLEH23' (green).

QANDA Home

Search Profile Logout

Questions

Online Resources

Tutorship

Teacher Ratings

Buy and Sell

Filter By Tags

Select...

How To Read Files in Java

Description: Reading Files in Java made Easy

Full Link: <https://www.mkyong.com/java/how-to-read-file-in-java-fileinputstream/>

Go to Online Resources

Date: 2018-05-07

Announcements

SPORT NEWS

GITHUB

BOOTSTRAP

LINKEDIN

GOOGLE

HUGHUGSY

z-e-r-0

SOLEH23

Figure 30: Online Resource Detail Page

Tutorship Page:

In the left side of the screen you will see five different buttons to link for related pages. The first button “Questions” is the default as home page where users are able to post questions after they log in. If you click any question, you are able to answer that question also see other answers too.

The screenshot shows the QANDA Home page with a sidebar on the left and a main content area with several tutorship posts.

Left Sidebar:

- Questions
- Online Resources
- Tutorship
- Teacher Ratings
- Buy and Sell

Filter By Tags: Select...

Main Content Area (Tutorship Posts):

- Tutor for every course**
Type: TUTOR
Description: PHD student challenging myself to teach every undergrad course
Date: 2018-05-07
- Java Midterm Prep**
Type: HIRE
Description: Need a tutor for helping me with the midterm preparation for CS 102 midterm
Date: 2018-05-07
- Private Lessons for CS201, 473 & 476**
Type: HIRE
Description: Contact: Whatsapp 0293487335
Date: 2018-05-07
- Digital Design Midterm Prep**
Type: HIRE
Description: I need from 0 to 1 help. Will pay any money.
Contact: Whatsapp 098274323
Date: 2018-05-07
- OS**
Type: TUTOR
Description: OS tutor for everything. Contact: mail@mail.ru
Date: 2018-05-07
- Computer Organization Project**
Type: HIRE
Description: Need somebody who is good with computer organization project. Just help not the whole project. Contact: Whatsapp: 08934289234
Date: 2018-05-07
- Database**
Type: HIRE
Description: Help needed for final exams. Starting from zero because I missed all the classes. Don't even know how I made it to finals. Contact Whatsapp: +12398739213
Date: 2018-05-07
- Digital Design**
Type: HIRE
Description: Need Help for Midterm. Contact: sleim@sliemorignal.com
Date: 2018-05-07
- Data Structures**
Type: TUTOR
Description: I'll help you out with the course and interview related questions. You don't need to know all the stuff in detail. I'll explain you the main points in other words the idea. Contact me at gmail@gmail.com
Date: 2018-05-07
- Java GUI**
Type: TUTOR
Description: I know the subject pretty well and I won't charge you. Email geteducated@mail.ru
Date: 2018-05-07
- C++**
Type: HIRE
Description: Having big troubles understanding pointers and all this stuff. Help needed. Whatsapp: 0583834333
Date: 2018-05-07
- Automata Course**
Type: TUTOR
Description: I'm a masters student majoring in Electrical and Electronics Engineering. If you wanna get an A hit me up. Whatsapp: +9212323212
Date: 2018-05-07
- Java Basic**
Type: TUTOR
Description: I got A+ from both CS101 and CS 102. Wanna try myself in teaching. Promise to be kind. Contact me at info@cs101teachinwhynot.com
Date: 2018-05-07

Right Sidebar:

- Announcements
- SPORT NEWS
- GITHUB
- BOOTSTRAP
- LINKEDIN
- GOOGLE
- HUGHUGSY
- z-e-r-0
- SOLEH23

Figure 31: Tutorship Page where user didn't login

QANDA Home

Questions

Online Resources

Tutorship

Teacher Ratings

Buy and Sell

Filter By Tags

Select...

Are you looking for a Tutor? or Do you want to give private lesson?

POST

Tutor for every course

Type: TUTOR

Description: PHD student challenging myself to teach every undergrad course

Date: 2018-05-07

Computer Organization Project

Type: HIRE

Description: Need somebody who is good with computer organization project. Just help not the whole project. Contact: Whatsapp: 08934289234

Date: 2018-05-07

Java GUI

Type: TUTOR

Description: I know the subject pretty well and I won't charge you. Email geteducated@mail.ru

Date: 2018-05-07

Java Midterm Prep

Type: HIRE

Description: Need a tutor for helping me with the midterm preparation for CS 102 midterm

Date: 2018-05-07

Database

Type: HIRE

Description: Help needed for final exams. Starting from zero because I missed all the classes. Don't even know how I made it to finals. Contact Whatsapp: +12398739213

Date: 2018-05-07

C++

Type: HIRE

Description: Having big troubles understanding pointers and all this stuff. Help needed. Whatsapp: 0583834333

Date: 2018-05-07

Private Lessons for CS201, 473 & 476

Type: HIRE

Description: Contact: Whatsapp 0293487335

Date: 2018-05-07

Digital Design

Type: HIRE

Description: Need Help for Midterm. Contact: sleim@siemorignal.com

Date: 2018-05-07

Automata Course

Type: TUTOR

Description: I'm a masters student majoring in Electrical and Electronics Engineering. If you wanna get an A hit me up. Whatsapp: +9212323212

Date: 2018-05-07

Digital Design Midterm Prep

Type: HIRE

Description: I need from 0 to 1 help. Will pay any money. Contact: Whatsapp 098274323

Date: 2018-05-07

Data Structures

Type: TUTOR

Description: I'll help you out with the course and Interview related questions. You don't need to know all the stuff in detail. I'll explain you the main points in other words the idea. Contact me at gmail@gmail.com

Date: 2018-05-07

Java Basic

Type: TUTOR

Description: I got A+ from both CS101 and CS 102. Wanna try myself in teaching. Promise to be kind. Contact me at info@cs101teachinwhynot.com

Date: 2018-05-07

OS

Type: TUTOR

Description: OS tutor for everything. Contact: mail@mail.ru

Date: 2018-05-07

Announcements

SPORT NEWS

GITHUB

BOOTSTRAP

LINKEDIN

GOOGLE

HUGHUGSY

z-e-r-0

SOLEH23

Figure 32: Tutorship Page with logged in user

QANDA Home

Search Profile Logout

Questions

Online Resources

Tutorship

Teacher Ratings

Buy and Sell

Tutor for every course

Description: PHD student challenging myself to teach every undergrad course

[Go to Tutorship](#)

Date: 2018-05-07

Announcements

SPORT NEWS

GITHUB

BOOTSTRAP

LINKEDIN

GOOGLE

HUGHUGSY

z-e-r-0

SOLEH23

Filter By Tags

Select... ▾

Figure 33: Tutorship Detail Page

Teacher Rating Page:

Users are able to grade and comment for teachers in our database. Grading is based on three features of the instructor (grading, teaching and workload). These features will appear as progress bar. The displayed points are the average of users' entries. Also when you click on a teacher card, you can comment and see other comments too.

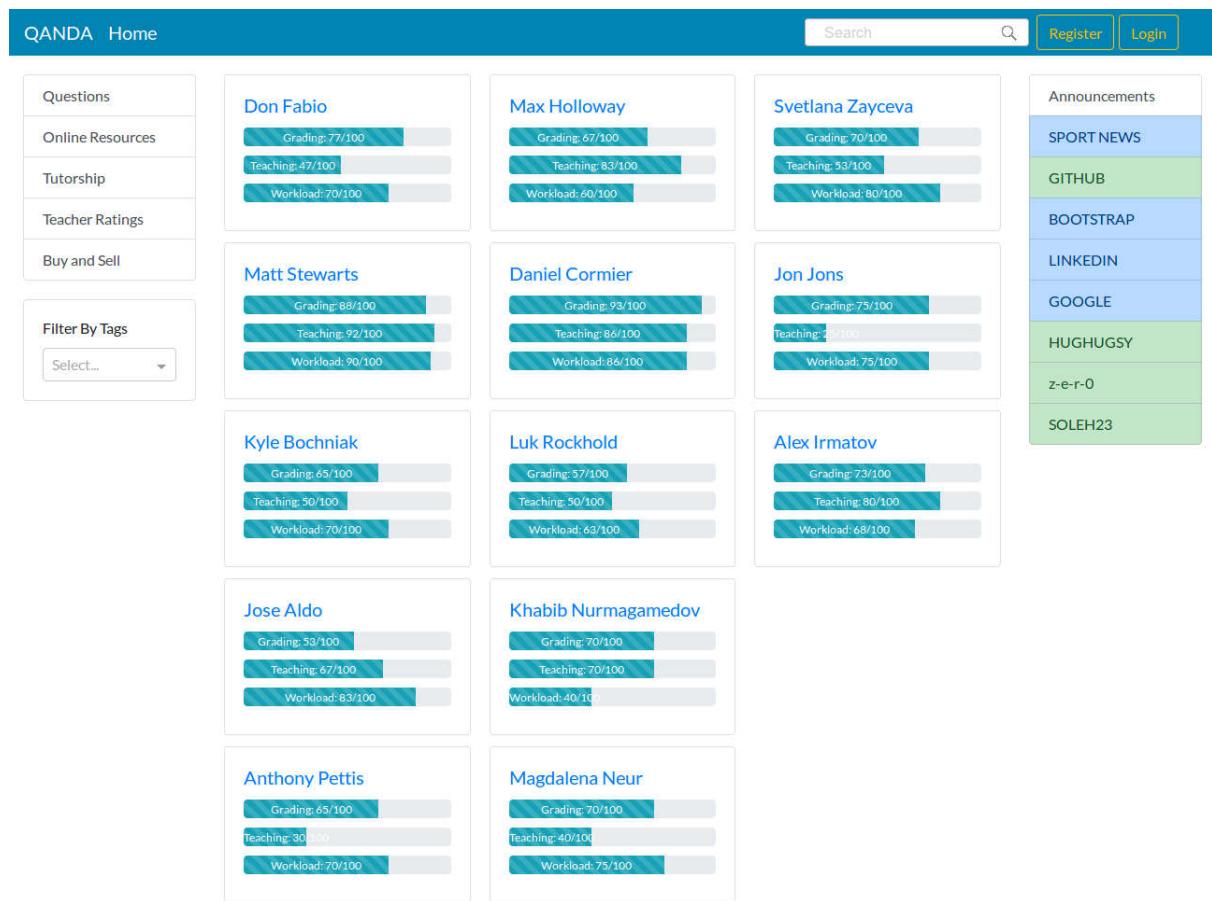


Figure 34: Teacher Rating page where user didn't login

QANDA Home

[Questions](#)
[Online Resources](#)
[Tutorship](#)
[Teacher Ratings](#)
[Buy and Sell](#)

Don Fabio

Grading: 77/100

Teaching: 47/100

Workload: 70/100

[Rate](#)

Max Holloway

Grading: 67/100

Teaching: 83/100

Workload: 60/100

[Rate](#)

Svetlana Zayceva

Grading: 70/100

Teaching: 53/100

Workload: 80/100

[Rate](#)

Matt Stewarts

Grading: 88/100

Teaching: 92/100

Workload: 90/100

[Rate](#)

Daniel Cormier

Grading: 93/100

Teaching: 86/100

Workload: 86/100

[Rate](#)

Jon Jons

Grading: 75/100

Teaching: 65/100

Workload: 75/100

[Rate](#)

Kyle Bochniak

Grading: 65/100

Teaching: 50/100

Workload: 70/100

[Rate](#)

Luk Rockhold

Grading: 57/100

Teaching: 50/100

Workload: 63/100

[Rate](#)

Alex Irmatov

Grading: 73/100

Teaching: 80/100

Workload: 68/100

[Rate](#)

Jose Aldo

Grading: 53/100

Teaching: 67/100

Workload: 83/100

[Rate](#)

Khabib Nurmagomedov

Grading: 70/100

Teaching: 70/100

Workload: 40/100

[Rate](#)

Anthony Pettis

Grading: 65/100

Teaching: 30/100

Workload: 70/100

[Rate](#)

Magdalena Neur

Grading: 70/100

Teaching: 40/100

Workload: 75/100

[Rate](#)

Announcements

SPORT NEWS

GITHUB

BOOTSTRAP

LINKEDIN

GOOGLE

HUGHUGSY

z-e-r-O

SOLEH23

Figure 35 : Teacher Rating page with logged in user

QANDA Home

Search Profile Logout

Questions

Online Resources

Tutorship

Teacher Ratings

Buy and Sell

Don Fabio

Grading: 77/100

Teaching: 47/100

Workload: 70/100

Select... ▼

Grading 5 / 10 Slider

Teaching 5 / 10 Slider

Workload 5 / 10 Slider

Cancel Submit

Jose Aldo

Grading: 53/100

Teaching: 67/100

Workload: 83/100

Rate

Khabib Nurmagomedov

Grading: 70/100

Teaching: 70/100

Workload: 40/100

Rate

Anthony Pettis

Grading: 65/100

Teaching: 30/100

Workload: 70/100

Rate

Magdalena Neur

Grading: 70/100

Teaching: 40/100

Workload: 75/100

Rate

Max Holloway

Grading: 67/100

Teaching: 83/100

Workload: 60/100

Rate

Svetlana Zayceva

Grading: 70/100

Teaching: 53/100

Workload: 80/100

Rate

Matt Stewarts

Grading: 88/100

Teaching: 92/100

Workload: 90/100

Rate

Daniel Cormier

Grading: 93/100

Teaching: 86/100

Workload: 86/100

Rate

Jon Jons

Grading: 73/100

Teaching: 65/100

Workload: 75/100

Rate

Kyle Bochniak

Grading: 65/100

Teaching: 50/100

Workload: 70/100

Rate

Luk Rockhold

Grading: 57/100

Teaching: 50/100

Workload: 83/100

Rate

Alex Irmatov

Grading: 73/100

Teaching: 80/100

Workload: 68/100

Rate

Announcements

- SPORT NEWS
- GITHUB
- BOOTSTRAP
- LINKEDIN
- GOOGLE
- HUGHUGSY
- z-e-r-0
- SOLEH23

Figure 36: Teacher Rating with rating widget toggled

QANDA Home

Search  Profile Logout

Questions
Online Resources
Tutorship
Teacher Ratings
Buy and Sell

Filter By Tags
Select... ▾

Don Fabio

Grading: 77/100
Teaching: 47/100
Workload: 70/100

Comment

Cancel Comment

Comment Section

Announcements
SPORT NEWS
GITHUB
BOOTSTRAP
LINKEDIN
GOOGLE
HUGHUGSY
z-e-r-0
SOLEH23



Figure 37: Teacher Rating Detail Page

Buy and Sell Page:

There is an opportunity to sell or buy course related stuff like books, notes, fpga card, etc. In this page, you will see posts as cards which include title, price, contact info, description and post date.

The screenshot shows the QANDA Home page with a sidebar on the left containing links for Questions, Online Resources, Tutorship, Teacher Ratings, and Buy and Sell. A dropdown menu for 'Filter By Tags' is also present. The main content area displays a grid of 15 cards, each representing a different item for sale. The items include:

- Problem Solving Book**: Price: 25 TL, Contact Info: Whatsapp: 0912301213, Description: General Problem Solving book for skill and interview crashing improvement, Date: 2018-05-07.
- FPGA**: Price: 350 TL, Contact Info: mailme@mailyou.com, Description: I used it like 10 times totally. It's in the same condition with the new meteksan edition, Date: 2018-05-07.
- Automata Theory Notes**: Price: 35 TL, Contact Info: Whtasp: 03453487534, Description: Notes from the lectures. Not trying to full anybody they are not full, Date: 2018-05-07.
- C++ for beginners**: Price: 200 TL, Contact Info: Whatsapp: 05849837454, Description: Bought from amazon and passed CS 201 and CS 202 in easy mode. It was so easy you can't even believe it. Jokes aside it really helped me to master C++ basics. I was having trouble in the beginning but now two A+'s, Date: 2018-05-07.
- Database Systems**: Price: 100 TL, Contact Info: snapchat: lolipop, Description: Not very useful, but I decided maybe someone needs it, Date: 2018-05-07.
- Operating Systems**: Price: 200 TL, Contact Info: contacteren@gmail.com, Description: I'm dropping the course and leaving Bilkent University so I'm just selling all the books I have. Barely used. Have fun studying, Date: 2018-05-07.
- CS223,224 book**: Price: 110 TL, Contact Info: whatsapp: 0234872384, Description: New and Fresh just like the exams want, Date: 2018-05-07.
- Coursebook**: Price: 80 TL, Contact Info: mailiyusuf@mail.ru, Description: Nothing Special Just the coursebook. New and barely used. Minimum number of notes inside the book, Date: 2018-05-07.
- Didgital Design**: Price: 120 TL, Contact Info: mail@webmail.ru, Description: The classbook. Bought from meteksan, Date: 2018-05-07.
- OS notes**: Price: 0 TL, Contact Info: 77 Dorm, Description: Just being a philanthropist, Date: 2018-05-07.
- Notes**: Price: 30 TL, Contact Info: Whatsapp: 0832923403234, Description: Notes written in A4. Clear and Fresh, Date: 2018-05-07.
- FPGA Light Chip**: Price: 50 TL, Contact Info: Whatsapp: 0293420343, Description: You need it if your doing some project related to the leds/lights, Date: 2018-05-07.
- Operating System Book**: Price: 100 TL, Contact Info: Instagram: popoll, Description: Bought from friend. Just begin straightforward. For like 145. Just don't need it anymore, I passed !!!, Date: 2018-05-07.
- Object Oriented Design**: Price: 100 TL, Contact Info: Whatsapp: 0128912839, Description: This is a really nice book for beginners. It is easy to follow and to learn from. Barely used, Date: 2018-05-07.

On the right side, there is a sidebar with links for Announcements, SPORT NEWS, GITHUB, BOOTSTRAP, LINKEDIN, GOOGLE, HUGHUGSY, z-e-r-0, and SOLEH23.

Figure 39: Buy And Sell page where user didn't login

QANDA Home

[Questions](#)
[Online Resources](#)
[Tutorship](#)
[Teacher Ratings](#)
[Buy and Sell](#)

Add Item

Problem Solving Book

Price: 25 TL

Contact Info: Whatsapp: 0912301213

Description: General Problem Solving book for skill and interview crashing improvement

Date: 2018-05-07

FPGA

Price: 350 TL

Contact Info: mailme@mailyou.com

Description: I used it like 10 times totally. It's in the same condition with the new meteksan edition.

Date: 2018-05-07

Automata Theory Notes

Price: 35 TL

Contact Info: Whtasp: 03453487534

Description: Notes from the lectures. Not trying to full anybody they are not full.

Date: 2018-05-07

C++ for beginners

Price: 200 TL

Contact Info: Whatsapp: 05849837454

Description: Bought from amazon and passed CS 201 and CS 202 in easy mode. It was so easy you can't even believe it. Jokes aside it really helped me to master C++ basics. I was having trouble in the beginning but now two A+'s.

Date: 2018-05-07

Database Systems

Price: 100 TL

Contact Info: snapchat: lolipop

Description: Not very useful. but I decided maybe someone needs it.

Date: 2018-05-07

Operating Systems

Price: 200 TL

Contact Info: contacteren@gmail.com

Description: I'm dropping the course and leaving Bilkent University so I'm just selling all the books I have. Barely used. Have fun studying.

Date: 2018-05-07

CS223,224 book

Price: 110 TL

Contact Info: whatsapp: 0234872384

Description: New and Fresh just like the exams want.

Date: 2018-05-07

Didgital Design

Price: 120 TL

Contact Info: mail@webmail.ru

Description: The classbook. Bought from meteskan.

Date: 2018-05-07

Coursebook

Price: 80 TL

Contact Info: mailyusuf@mail.ru

Description: Nothing Special Just the coursebook. New and barely used. Minimum number of notes inside the book.

Date: 2018-05-07

OS notes

Price: 0 TL

Contact Info: 77 Dorm

Description: Just being a philanthropist

Date: 2018-05-07

Notes

Price: 30 TL

Contact Info: Whatsapp: 0832923403234

Description: Notes written in A4. Clear and Fresh)

Date: 2018-05-07

FPGA Light Chip

Price: 50 TL

Contact Info: Whatsapp: 0293420343

Description: You need it if your doing some project related to the leds/lights.

Date: 2018-05-07

Operating System Book

Price: 100 TL

Contact Info: Instagram: popoll

Description: Bought from friend. Just begin straightforward. For like 145. Just don't need it anymore, I passed !!!

Date: 2018-05-07

Object Oriented Design

Price: 100 TL

Contact Info: Whatsapp: 0128912839

Description: This is a really nice book for beginners. It is easy to follow and to learn from. Barely used.

Date: 2018-05-07

Announcements

SPORT NEWS

GITHUB

BOOTSTRAP

LINKEDIN

GOOGLE

HUGHUGSY

z-e-r-0

SOLEH23

Figure 40: Buy And Sell page with logged in user

Figure 41: Buy And Sell Detail Page

Filtering

In any page, you can filter posts as their tags. Then you can survey more effectively in the website. The principle of the filtering is to displaying posts that include specific tag(s). However in the Teacher Ratings Page, filtering works different way. For example, if do not filter, you will see overall points of the instructor. When you select CS201, you will see average points of the instructor in CS201. That means, users can examine teacher in different courses.

Figure 42: Filtered Buy And Sell Page

Searching

While designing the project, our primary goal was that users could have easy access for what they look for. That is where the innovative part of the project appears. Our *Reactivesearch* feature and *mongodb* database system enable users fast and effective search among whole posts. Then users are able to select any post from suggestion list under the search bar.

The screenshot shows the QANDA Home page with a search bar at the top right containing the word "java". A dropdown menu is open, listing suggestions: "Java Midterm Prep", "Java Documentation", and "Java Object Oriented Design". To the left of the search bar is a sidebar with links to "Questions", "Online Resources", "Tutorship", "Teacher Ratings", and "Buy and Sell". Below these is a "Filter By Tags" section with a dropdown menu labeled "Select...". The main content area displays a grid of 12 cards, each representing a different post or service:

- Tutor for every course**: Type: TUTOR. Description: PHD student challenging myself to teach every undergrad course. Date: 2018-05-07.
- Computer Organization Project**: Type: HIRE. Description: Need somebody who is good with computer organization project. Just help not the whole project. Contact: Whatsapp: 08934289234. Date: 2018-05-07.
- Java GUI**: Type: TUTOR. Description: I know the subject pretty well and I won't charge you. Email: geteducated@mail.ru. Date: 2018-05-07.
- Java Midterm Prep**: Type: HIRE. Description: Need a tutor for helping me with the midterm preparation for CS 102 midterm. Date: 2018-05-07.
- Database**: Type: HIRE. Description: Help needed for final exams. Starting from zero because I missed all the classes. Don't even know how I made it to finals. Contact Whatsapp: +12398739213. Date: 2018-05-07.
- C++**: Type: HIRE. Description: Having big troubles understanding pointers and all this stuff. Help needed. Whatsapp: 0583834333. Date: 2018-05-07.
- Private Lessons for CS201, 473 & 476**: Type: HIRE. Description: Contact: Whatsapp 0293487335. Date: 2018-05-07.
- Digital Design**: Type: HIRE. Description: Need Help for Midterm. Contact: stein@sliemorignal.com. Date: 2018-05-07.
- Automata Course**: Type: TUTOR. Description: I'm a masters student majoring in Electrical and Electronics Engineering. If you wanna get an A hit me up. Whatsapp: +9212323212. Date: 2018-05-07.
- Digital Design Midterm Prep**: Type: HIRE. Description: I need from 0 to 1 help. Will pay any money. Contact: Whatsapp 098274323. Date: 2018-05-07.
- Data Structures**: Type: TUTOR. Description: I'll help you out with the course and interview related questions. You don't need to know all the stuff in detail. I'll explain you the main points in other words the idea. Contact me at gmail@gmail.com. Date: 2018-05-07.
- OS**: Type: TUTOR. Description: OS tutor for everything. Contact: mail@mail.ru. Date: 2018-05-07.
- Java Basic**: Type: TUTOR. Description: I got A+ from both CS101 and CS 102. Wanna try myself in teaching. Promise to be kind. Contact me at info@cs101teachinwhynot.com. Date: 2018-05-07.

Figure 43: Search and suggested item list

Members and Guests

Our application limits users that are not logged in. These limitations are posting, answering, grading teacher. In other words, guest have read only permission. When a user log in, there will be no limitation then. In order to login, user has to register first.

Announcements

In the right side of the page, you will see announcement bar, that may contain useful links for you. Editors will be able to set this bar. Some club events and seminars notification can be place here.

References

- [1] MongoDB. (2018). *The Modern Application Stack - Part 5: Using ReactJS, ES6 & JSX to Build a UI (the rise of MERN)*. [online] Available at: <https://www.mongodb.com/blog/post/the-modern-application-stack-part-5-using-reactjs-es6-and-jsx-to-build-a-ui-the-rise-of-mern> [Accessed 7 May 2018].
- [2] GitHub. (2018). *facebook/react-devtools*. [online] Available at: <https://github.com/facebook/react-devtools> [Accessed 7 May 2018].
- [3] GitHub. (2018). *zalmoxisus/redux-devtools-extension*. [online] Available at: <https://github.com/zalmoxisus/redux-devtools-extension> [Accessed 7 May 2018].
- [4] MongoDB. (2018). *MongoDB Compass*. [online] Available at: <https://www.mongodb.com/products/compass> [Accessed 7 May 2018].
- [5] Code, V. (2018). *Documentation for Visual Studio Code*. [online] Code.visualstudio.com. Available at: <https://code.visualstudio.com/docs> [Accessed 7 May 2018].
- [6] Sublimetext.com. (2018). *Sublime Text - A sophisticated text editor for code, markup and prose*. [online] Available at: <https://www.sublimetext.com/> [Accessed 7 May 2018].
- [7] Yarn. (2018). *Yarn*. [online] Available at: <https://yarnpkg.com/lang/en/docs/getting-started/> [Accessed 7 May 2018].
- [8] Webpack.js.org. (2018). *Concepts*. [online] Available at: <https://webpack.js.org/concepts/> [Accessed 7 May 2018].

[9]Mark Otto, a. (2018). *Introduction*. [online] Getbootstrap.com. Available at:
<https://getbootstrap.com/docs/4.1/getting-started/introduction/> [Accessed 7 May 2018].