A Project Report on

Question Paper Generation at a Click Supporting Outcome Based

Submitted in partial fulfillment of the requirements for the award
of the degree of

Bachelor of Engineering

in

Information Technology

by

AnmolSingh Paman(18204003)
Rahul Rahi(17104057)
Abhishek Jha(18204008)

Under the Guidance of

Prof. Yaminee Patil

Department of Information Technology
NBA Accredited
A.P. Shah Institute of Technology
G.B.Road,Kasarvadavli, Thane(W), Mumbai-400615
UNIVERSITY OF MUMBAI

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Approval Sheet

This Project Report entitled ***"Question Paper Generation at a Click Supporting Outcome Based"*** Submitted by ***"AnmolSingh Paman"(18204003),"Rahul Rahi"(17104057) "Abhishek Jha"(18204008)***is approved for the partial fulfillment of the requirenment for the award of the degree of ***Bachelor of Engineering*** in ***Information Technology*** from ***University of Mumbai***.

(Prof. Yaminee Patil)
Guide

Prof. Kiran Deshpande
Head Department of Information Technology

Place:A.P.Shah Institute of Technology, Thane
Date:

CERTIFICATE

This is to certify that the project entitled ***"Question Paper Generation at a Click Supporting Outcome Based"*** submitted by ***"AnmolSingh Paman" (18204003),'Rahul Rahi" (17104057),"Abhishek Jha" (18204008)*** for the partial fulfillment of the requirement for award of a degree ***Bachelor of Engineering*** in ***Information Technology***,to the University of Mumbai,is a bonafide work carried out during academic year 2020-2021.

(Prof. Yaminee Patil)
Guide

Prof. Kiran Deshpande
Head Department of Information Technology

Dr. Uttam D.Kolekar
Principal

External Examiner(s)

1.

2.

Place:A.P.Shah Institute of Technology, Thane
Date:

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Student Name1: AnmolSingh Paman
Student ID1: 18204003

Student Name2: Rahul Rahi
Student ID2: 17104057

Student Name3: Abhishek Jha
Student ID3: 18104008

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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(Signature)

_____

(AnmolSingh Paman - 18204003)
(Rahul Rahi - 17104057)
(Abhishek Jha - 18204008)

Date:

Abstract

Assessment process is an essential activity in educational institutions to test performance of the learners. The essence of examination papers is directly linked to evaluation of quality of the graduates passing out. Nevertheless, designing question papers is laborious/tedious task for the teachers. This system is aimed to replace manual method practiced by academics. This system is intended to enable academics to produce quality examination papers on the click, that are unbiased, streamlined, randomized and secure while saving the time and resources in the assessment process. It includes MCQ, open-ended questions. We have 2 types of user- Admin and Faculty. In this, the role of Admin is to Add, Modify, Delete users and store their information in database and the role of the Lecturer is to Add Questions and save them in Question bank database; Generate question paper and Export the generated Question Paper. System returns generated paper and exports it into user's computer.

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Chapter 1

Introduction

As an education is a key to success, the examination process is a critical activity for educational institutions to evaluate performance of learners. Content of the exam papers is the main criteria to ensure the education quality level of the students brought out by the institutions. Examination as well serves as a guide to students in their gradual journey to knowledge. That is why proper examination paper compilation procedure is essential.

Generating question paper is long and tedious process in a university or institution. The professors spend their precious time in designing the question paper which is not acceptable in these days. This system comes in rescue to professors and helps to create question papers in single click without repeating the same questions again and works in a very simple manner.

As we move ahead we need more resources to fulfill our requirements and that's why this Automatic Question Paper Generator was designed. The questions are stored in the database and new questions can be added later on if needed. This system is so powerful that we can generate one question paper in just one second. Its primary characteristics is the automation of process of creation of question paper which reduces human effort to a very far extent. Although it's most prevalent use is within the universities to generate the question paper. It is also applicable to some institutions too.

It increases the usage of technology. This paper describes the utilization of randomization algorithm in this system has been implemented specially for institutes. The endeavor needed for generating question paper is diminished after the implementation of this advanced system and because of this advanced system there is no obligation for humans to ponder and employ time which can be utilized on some additional important duty instead of designing question paper The system also provides security to the database so that only trusted and permitted people can access it. The present project has been developed to meet the aspirations indicated in the modern age. An attempt has been made through this project to do all work ease fast.

1.1 Objectives

- Question entered in the database should cover the Syllabus.
- Question Paper formed should be confirmed by the NBA co-ordinator.
- Question Paper formed should address the desired Course Objectives

1.2 Problem Identified

- **Problem Identified:**

  The existing system for Question Paper Generation requires human staff to chalk out questions that appear in the question paper. Question Paper creation is a tedious and time consuming task

- **Solution Proposed:**

  To create a system which reduces Human Working process and also The Instructor to generate and Save The Question Paper Automatically.

1.3 Overview

1.3.1 Hardware Requirements:

- Processor type: Minimum:- Intel Pentium 3/ Pentium 4

  Recommended:- Intel Core 2 duo or higher

- Processor Speed:- 2.1Ghz or more
- RAM:- Minimum:- 2GB DDR3 RAM

  Recommended:- 4GB DDR3 RAM

- Hard Disk Space:- 160GB Hard Disk space

1.3.2 Software Requirements:

- Operating System: Windows XP/2000/Vista/7/8/10 or Linux or MacOS
- Languages used: PHP, JavaScript, HTML, CSS, XML
- Algorithm Used- Shuffling Algorithm
- Database:- MySQL Database
- Browser:- Testing Environment
- WAMP or XAMPP Server

Chapter 2

Literature Review

1. Importance of quality assessment in education.

In the context of education, definition of assessment includes a number of procedures and methods that instructors apply to measure, evaluate and record the academic preparedness, learning progression, skill attainment, and academic needs of students.

Since the past decade global tendency in higher education has drifted away from the conventional teacher-centered approach which focused on the instructor's input and assessment in terms of how well the students absorb the materials. Such assessment method was considered too limited in evaluating learning, neglecting the nature of coherent ability that is meant to integrate various individual skills into overall practice. Hence the education trend has shifted towards student-centered perspective concentrating on the learning outcomes, or what the learners are expected to be able to do at the end of the studying experience. Furthermore, employers and educational strategists will be better be aware of the graduates' capabilities for employment and liability purposes. It is deduced that student-centered approach to the organization of educational processes provides for better learning and more genuine student assessment. It has been also determined that such method is particularly essential for education for students using Information Systems.

The existing Learning Management Systems (LMS) support very basic level or limited tags such as question types. Even the most preferred LMS, Moodle allows creating only subjective/objective type of questions. Thus automatically generating question paper from a teacher's entered specification using a semantically tagged QR is the need of the hour today. The system to semi automatically tag the questions of a repository is in place.

In any educational course curriculum, the courses are defined with learning objectives. Teachers conduct assessments to know if students have achieved certain learning objectives or not. Teachers generate variety of question papers as per the universities' assessment requirements. It is very challenging for the teachers to make question papers with varied questions and which meet learning objectives of the course. There are no standardized methods to ensure quality of question paper. Hence there arises a need to have a system which will automatically generate the question paper from teacher entered specification within few seconds. Researchers recommend different sets of tags such as cognitive level, difficulty level, type of question, content /topic for defining a question etc. The existing tools are rigid and support very basic or limited tags. The proposed system will automatically generate a question paper from semantically tagged question repository.

This system offers flexibility by supporting all four tags and allows entry of every property in the form of ranges i.e. lower bound and upper bound. The question paper is generated in xml format and as PDF document or can also be Mailed.

2. Bloom's Taxonomy in Assessment.

As pointed out by Veilleux(1999), academics often concentrate on material coverage and consider an assessment complete if all main course topics are included in the exam. Coverage of material only concerns the breadth of students' knowledge, however of late an alternative method is preferable to assess its depth. Assessment of knowledge depth can be organized in accordance with Bloom's taxonomy. Taxonomy-based exams measure the level of learners' comprehension by including an organized set of questions, varying from easily resolved by a learner who grasped basic material, to cases which require creative approach in applying various techniques. Based on the difficulty level of the questions given, students' papers are marked according to fixed criteria, and not based on grade averages.

One of the most problematic tasks of question paper planning is achieving a balance in multiple question types which call for different levels of comprehension. Alternatively teachers can compile diverse examinations involving questions with graded difficulty. If a teacher specifically creates various understanding questions like short questions, application questions and a few analytical open-ended questions to make sure that students who have acquired each level, can show their performance

Prof. Veilleux (1999), further defined how academics benefit from applying Bloom's Taxonomy to ensure they are not missing out essential items out when compiling assessment and are as follows:

1. Frequently instructors find themselves perplexed by multiple standards and syllabus requirements. While Bloom's taxonomy provides a guiding model for subdividing those norms into approachable blocks that can be applied in making routine class plans and also can be aligned with instructor's own class objectives. Same as certain levels require certain comprehensive delivery approaches, they also require specific assessment techniques.

2. Taxonomy can be utilized as an index to verify that all levels of domain are being assessed and correspond the assessment tools with the relevant lessons and techniques. Thereby, Bloom's Taxonomy also helps educators to retain uniformity in assessment practices, educational materials and reveal weak spots.

3. Reference to the elements of taxonomy is a supportive tool for defining objectives and monitoring how well the students understand material. Besides defining the objectives, application of Bloom's taxonomy is also extremely useful in assessing students' comprehension of concepts. Referring to taxonomy levels and reviewing where the students stand among those, allow instructor to move forward from elementary to more sophisticated level of comprehension.

4. A conclusive substantial benefit from assessment based on objectives is essentially meaningful marks allocation, thus less disputable grading criteria –which eliminates doubt among students regarding the grades given and there is no need for marking adjustments from the educator's side. It is an indicator of justified assessment mechanism that can also be used to guide educators in adapting the level of directives for new modules (Veilleux, 1999)

Vidakovic et al. (2004) opined that Bloom's taxonomy has been proven to be a helpful guideline structure for generating short answer, multiple choice and long answer questions which test students' knowledge in various cognitive exercises. The emphasis lies in classification of the test item in a specific level of Bloom's taxonomy depending on the highest level of cognitive problem presented to the student.

3. Advantages of Using Information Systems in Assessment.

Many developing countries have not fully utilized information technology as a way of socioeconomic development. Although educational institutions are progressively acknowledging significance of technology in education and examination practices, in most of the institutions examination process is still handled manually. Manual procedure has many drawbacks such as time consumption and resources wastage to purchase and store paper records; it may cause errors, data redundancy and duplication of work if the same data could be recorded by different examination board members; not communicating examination results instantly and precisely etc. Workload complexity increases, multiplied by number of subjects each instructor has to assess during academic session. By automating the assessment system institutions can reduce human involvement by acquiring the technology since it promises concise storage, rapid data retrieval, tireless rigorous work of processing the information, instant communication of information to users. The recent cases of rail transport computerization and online banking are the prospect examples demonstrating the advantages of using information technology. Thereby learning management systems as well can be efficiently utilized for assessment purposes in higher education. Automated Question Paper Generator System dramatically decreases the amount of work and time instructors spend on manual tasks.

4. Systems comparison.

Manual	Automatic
Prone to repetitions / duplications	Random and unbiased generation
Slow due to human labor	Speedy due to automation
Requires resources	Requires only PC connectivity
Many steps in sorting questions based on difficulty	Automated questions sorting based on difficulty
Questions used are not stored in one place	All questions are stored in database
Low Security	High Security and Encryption

Table 2.1: Difference between Manual and Automatic Paper Generation Systems

Automated system will significantly lessen the efforts of an instructor, which allows generating a question paper in a few clicks based on the requirements, such as marks and difficulty level of questions. Shuffling algorithm ensures randomization in process of selecting questions from the database hence preventing duplication of the questions.

5. Results of the Survey Conducted

Q1.

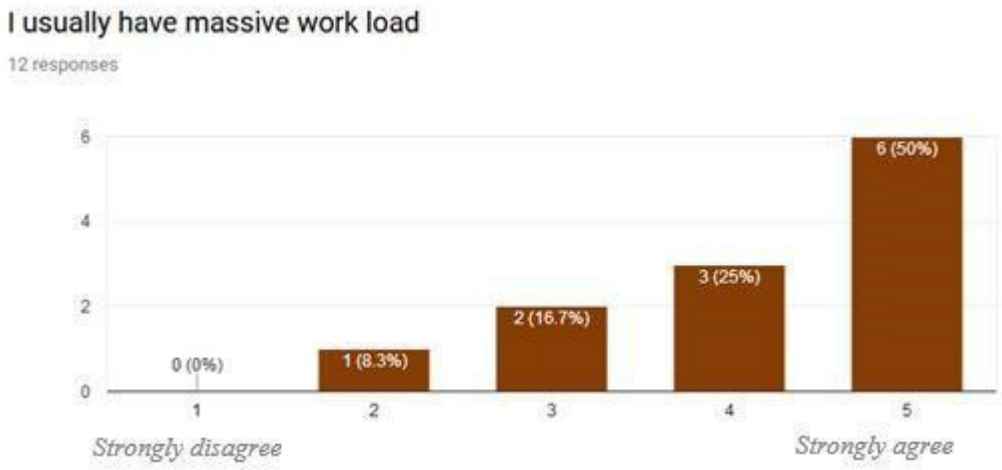


Figure 2.1: Workload Analysis of Teachers

Assumingly due to wide range of responsibilities, more than 90 percent of respondents agreed that they have massive work load. This illustration means that the lecturers, who answered the survey, are responsible for tasks such as preparing course materials, lecturing for 15 hours/ week, counselling, manually creating assessment questions, invigilating and supervising students. The result above means that the staffs are usually much occupied and automation of some of their tasks would greatly assist them in carrying out their duties efficiently.

Q2.

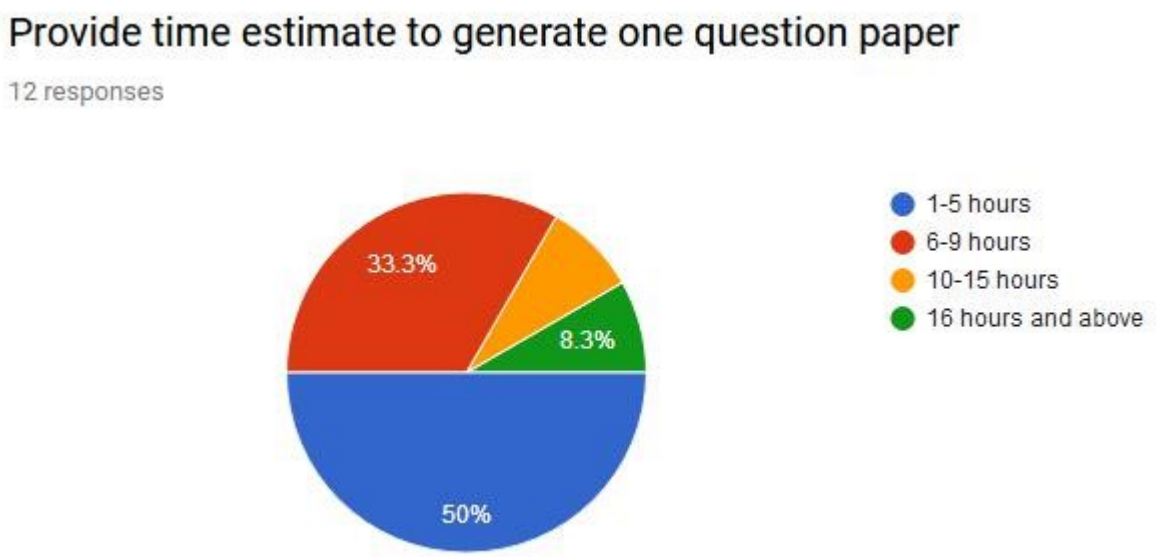


Figure 2.2: Poll results of estimated time to Generate Question Paper

The above pie chart depicts the results of poll taken from various teachers to estimate the average amount of time to generate one question paper. The results state that 50 percent of the teachers take nearly 1-5 hours to generate one question paper. 33.3 percent of the teachers take nearly 6-9 hours. But 8.4 percent teachers say that it takes 10-15 hours to generate one question paper and 8.3 percent teachers say that it takes 16+ hours to generate one single question paper.

Chapter 3

Project Design

3.1 Proposed System

Considering the short coming of conventional system, an eager need was felt to redesign the whole system. To develop a new examination system, system was closely observed. Some qualities and capabilities which the system should carry are, developing the question bank automatically, limiting the human intervention to raise the secrecy standards, providing more flexibility in logical selection of questions for skeleton framing and handling multiple attributes containing imprecise data to perform human like reasoning effectively.

Automatic Question Paper Generator is a special software which is useful to schools, Institutes, publishers and test paper setters who want to have a huge database of questions and generate test papers frequently with ease. It mainly deals with the gathering, sorting and administration of a large amount of questions about different levels of toughness from scientific as well as non-scientific subjects related to various classes. The main aim of our system is to provide randomization technique with the help of Shuffling Algorithm in question paper generation system, .The generated question paper will fulfill the Course Objectives according to the Bloom's Taxonomy, thus different sets of question could be generated without repetition and duplication and could be sent to the NBA co-ordinator for confirmation and approval.

Our system divides users in two categories-

1. Admin
2. Faculty

Working of Proposed System

- Before user is able to access system, it is necessary to pass the authentication step through login form where user must enter the correct username and password given by system administrator. If user has admin role, login form will redirect to Admin Portal. If login details match a Faculty role, user will be redirected to Faculty Portal..

- If the user is new and is a Faculty, then the user must fill the Registration form first and after clicking on the Sign Up button, the admin will approve the Faculty. The the Faculty can have access to the system.

- Once user entered username and password which belong to admin role, Admin Portal is displayed, from which Admin has following roles:

    1. **Faculty details:** In this admin has the power to approve or disapprove faculty or even delete faculty by clicking on the respective button.
    2. **Branch details:** In this the new branches can be added using the branch id, branch name and click on the add branch button. It can also be deleted later if no longer required.
    3. **Add subject:** In this new subject can be added by entering new subject code, subject name, choosing the respective branch and finally click on the add subject button.
    4. **View subject:** View the list of subjects available along with its subject code. Admin can also search using subject name. Or delete it..
    5. **Assign subject:** Click on the dropdown menu, select the faculty from the list and click search. A box appears where the subject must be chosen and click on assign button.
    6. **Assigned subject details:** It displays subject name and the code also it has the faculty record button which shows the list of faculty assigned to particular subject. Delete button is used to remove the faculty assigned to particular subject.
    7. **Generate question paper:** Here we need to select number of questions for each module and difficulty level for each question. After selecting the questions from all the modules, then automatically the submit button will display, after clicking on the submit button, the question paper will be generated.

- If authentication as a lecturer role is successful, user accesses Lecturer Portal. Here Lecturer can do three main tasks:

    1. **Add Questions:** User can add question for a particular subject which is assigned by the admin to the user.
    2. **Display question:** In this section user will see the questions entered by all the faculties and the user can also edit questions which are entered by him only.
    3. **Generate question paper:** Here we need to select number of questions for each module and difficulty level for each question. After selecting the questions from all the modules, then automatically the submit button will display, after clicking on the submit button, the question paper will be generated.

- AQPG system retrieves questions from question bank using randomization and shuffling algorithm. Every word in questions' content is compared against specified **Bloom's Taxonomy** and **Course Objectives** categorization verbs acting as query keywords. If any question contains a verb matched as the specified keyword, it is placed in the respective section based on complexity level. This process is performed until the specified set of questions is retrieved. Upon receiving the specified set of Questions, the Lecturer

can select the required questions from retrieved set of Questions to form the Question Paper. After this the System checks the redundancy of the question's i.e. whether or not it is repeated question or not then it checks if the Question Paper is fulfilling the required Course Objectives. If Yes, the lecturer can click on the Generate Question Paper Button. If No, then a prompt message will appear before the user. Upon clicking "Generate Question Paper" button, Lecturer is able to download generated question paper or the Lecturer can simple email the Question Paper or click "Cancel" to abort generation. After the Question Paper is generated, the faculty can send the generated Question Paper to the NBA Co-Ordinator for verification and approval.

3.2 Data Flow Diagram

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled. They can be used to analyze an existing system or model a new one. Like all the best diagrams and charts, a DFD can often visually "say" things that would be hard to explain in words, and they work for both technical and nontechnical audiences, from developer to CEO. That's why DFDs remain so popular after all these years.

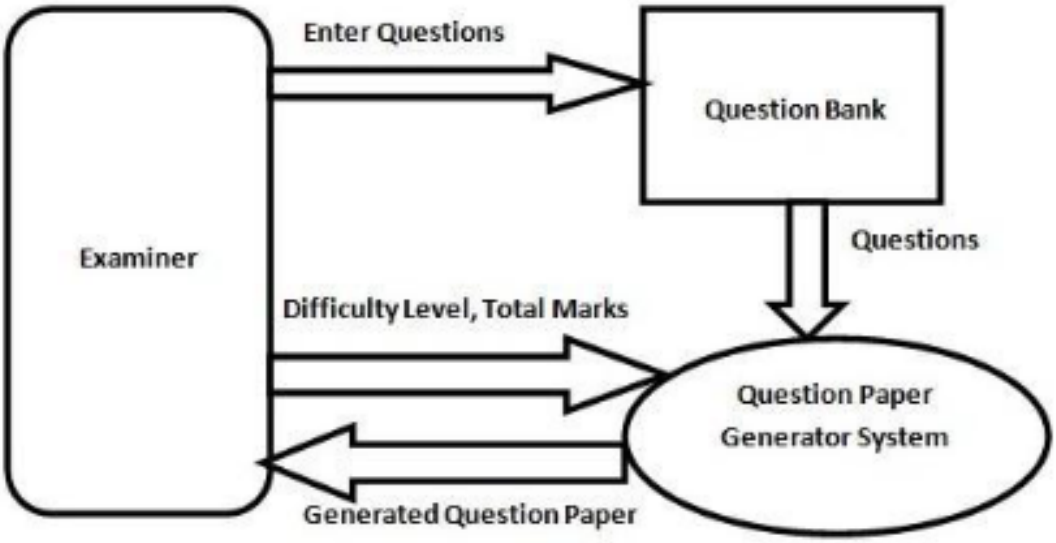


Figure 3.1: Data Flow Diagram

The above figure depicts the the Data Flow Diagram(DFD) of the proposed system. In the above diagram the role of Faculty as well as Admin is identified under the umbrella of Examiner. The diagram depicts that the Examiner enters the Question in the Question Bank which is basically the Database. Question entered in the Question Bank is stored in the Question Paper Generator System. While entering the question in the system the Examiner also enters the Difficulty Level and the Total Marks to be allotted to the Question. As and when the Examiner requires the Examiner can retrieve the automatically generated Question Paper from the System.

3.3 Class Diagram

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

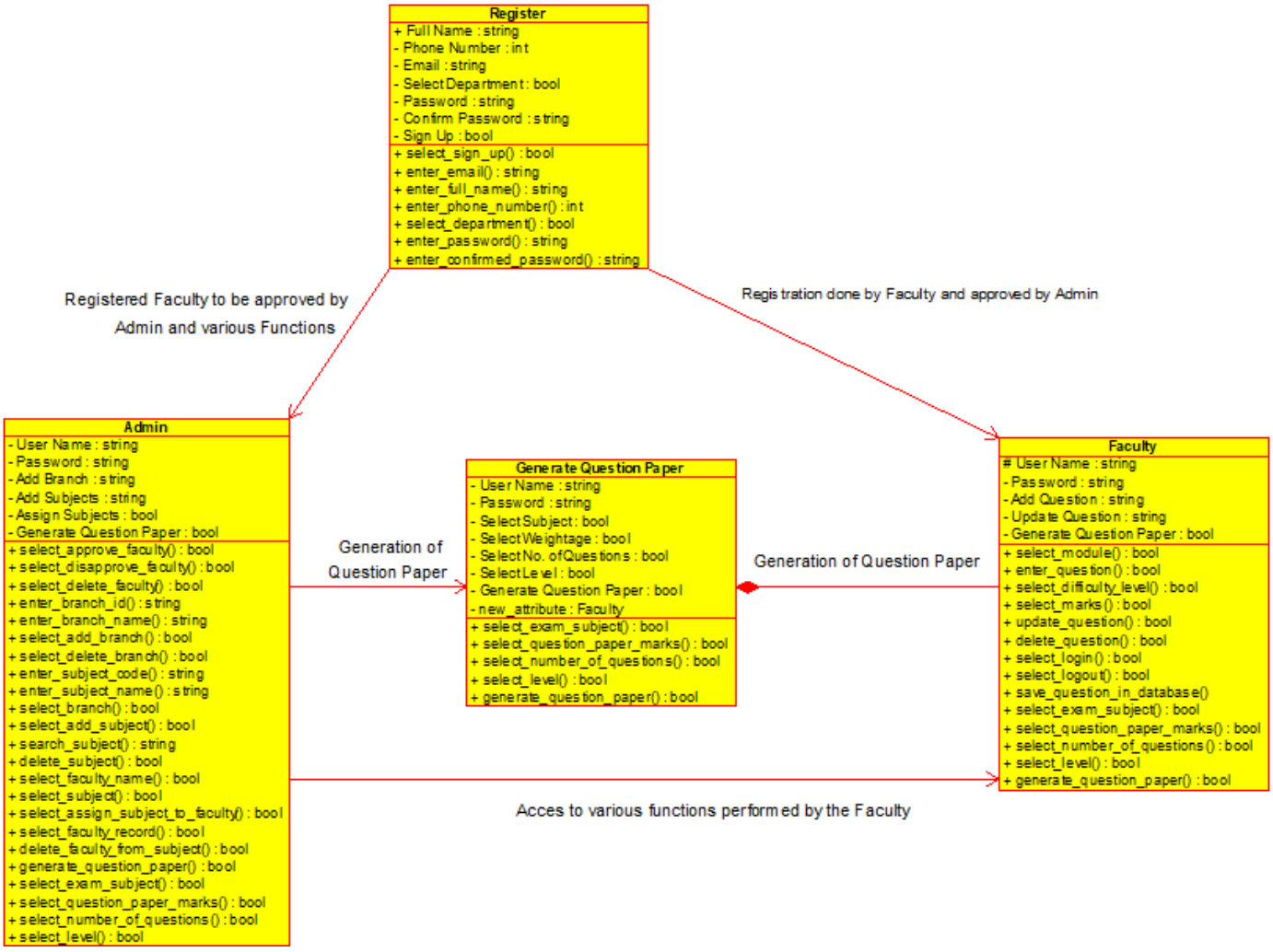


Figure 3.2: Class Diagram

Domain Classes existing in the Proposed Question Paper Generation System at Click Based Outcome:

- **Register:**

  Attributes: Full Name, Phone Number, Email, Select Department, Password, Confirm Password, Sign Up.

  Operations: enter_full_name(), enter_phone_number(), enter_email(), select_department(), select_sign_up(), enter_password(), enter_confirmed_password()

- **Admin:**

  Attributes: User Name, Password, Add Branch, Add Subjects, Assign Subjects, Generate Question Paper

  Operations: select_approve_faculty(), select_disapprove_faculty(), select_delete_faculty(), enter_branch_id(), enter_branch_name(), select_add_branch(), select_delete_branch(), enter_subject_code(), enter_subject_name(), select_branch(), select_add_subject(), search_subject(), delete_subject(), select_faculty_name(), select_subject(), select_assign_subject_to_faculty(), select_faculty_record(), delete_faculty_from_subject(), select_exam_subject(), select_question_paper
  select_number_of_questions(), select_level(), generate_question_paper()

- **Faculty:**

  Attributes: User Name, Password, Add Question, Update Question, Generate Question Paper.

  Operations: select_login(), select_module(), enter_question(), select_difficulty_level(), select_marks(), update_question(), delete_question(), save_question_in_database(), select_exam_subject(), select_question_paper_marks(), select_number_of_questions(), select_level(), generate_question_paper(), select_logout()

- **Generate Question Paper:**

  Attributes: User Name, Password, Select Subject, Select Weightage, Select No. of Questions, Select Level, Generate Question Paper.

  Operations: select_exam_subject(), select_question_paper_marks(), select_number_of_questions(
  select_level(), generate_question_paper()

3.4 Use Case Diagram

Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. Hence, when a system is analyzed to gather its functionalities, use cases are prepared and actors are identified.

3.4.1 Use Case Diagram for Admin:

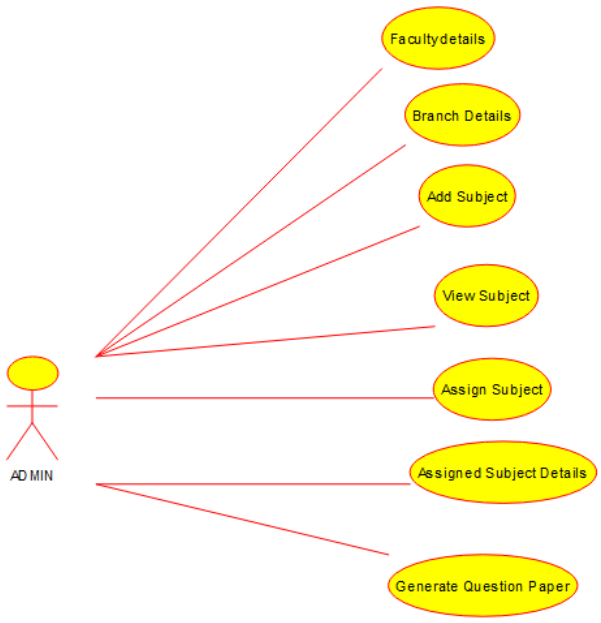


Figure 3.3: Use case Diagram for Admin

The above diagram is the Use Case diagram for Admin. The Admin plays a major role in this system. The Admin is usually the HOD of the Department. The admin can Approve, Disapprove or Delete the registered Faculty. The Admin can add a branch or delete a branch. the Admin can add a subject, view the added subjects or delete a subject. The Admin has the right to assign a subject or revoke a assigned subject from the Faculty. Lastly, an Admin also has the right to generate a Question Paper

3.4.2 Use Case Diagram for Faculty:

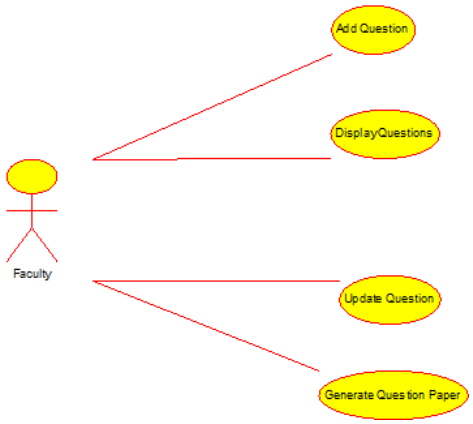


Figure 3.4: Use case Diagram for Faculty

The above diagram is the Use Case diagram of a Faculty. The Faculty firstly registers itself and it needs to get approved by the Admin. When it is approved by the Admin, the the faculty can basically perform 4 functions. The Faculty can add questions in the subject assigned to the Faculty by the Admin. The Faculty can view the questions added by the faculty as well as questions added by other faculties, and also update questions added by the faculty. Lastly, the faculty can generate the Question Paper of the assigned subject.

Chapter 4

Project Implementation

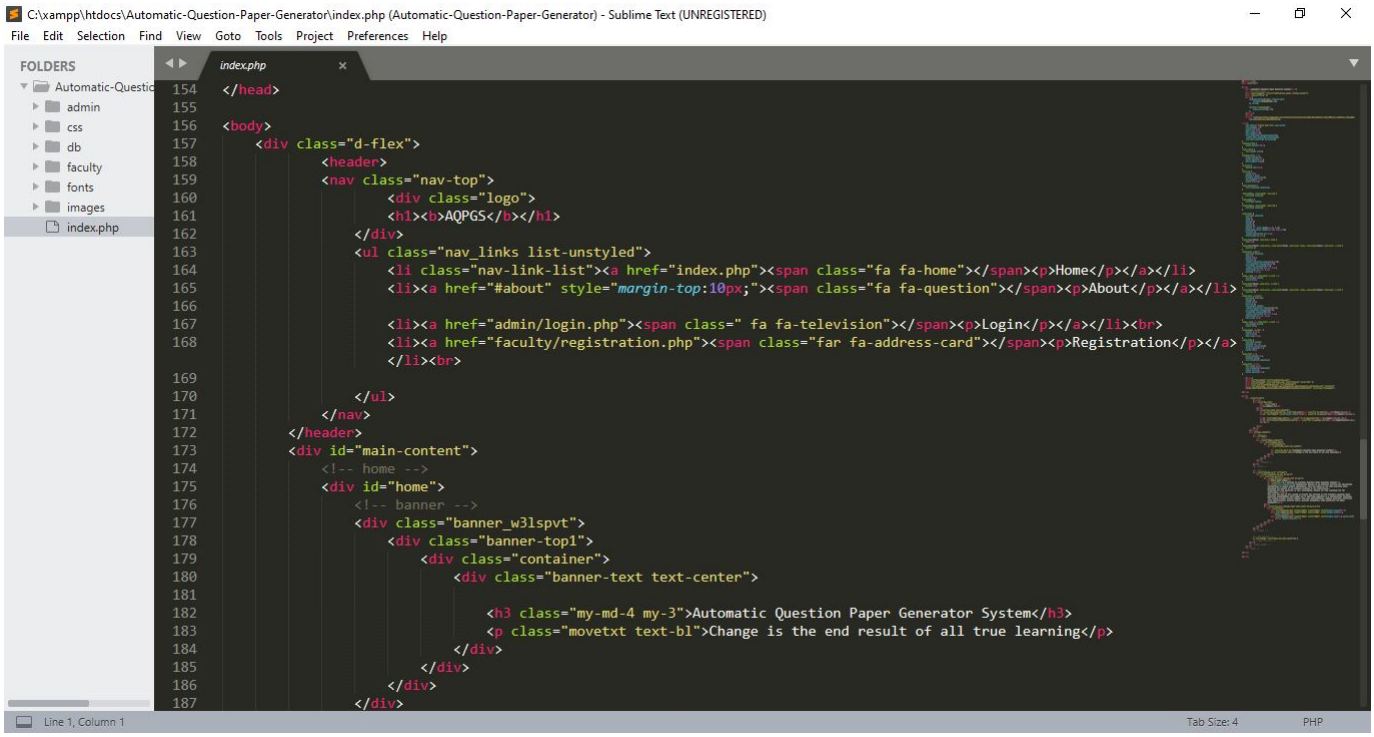


Figure 4.1: Index.php

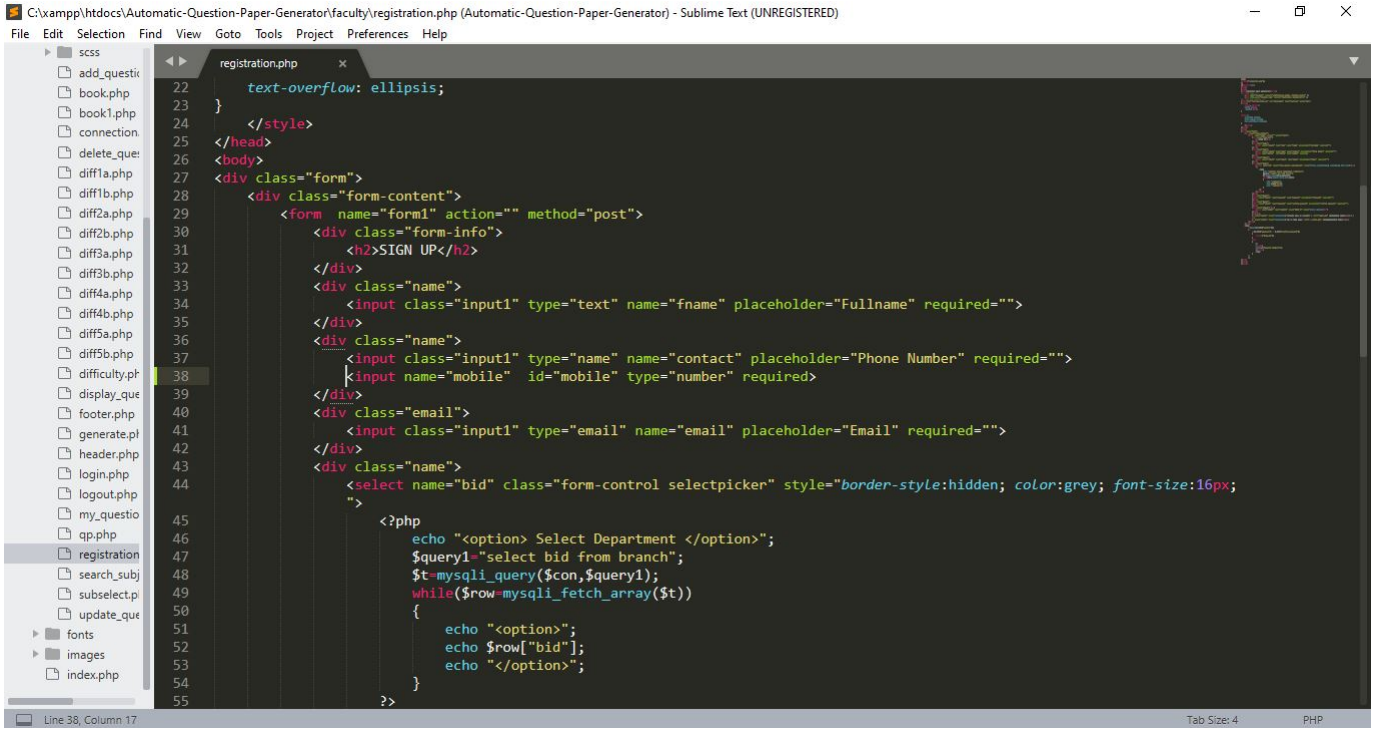


Figure 4.2: Registration.php

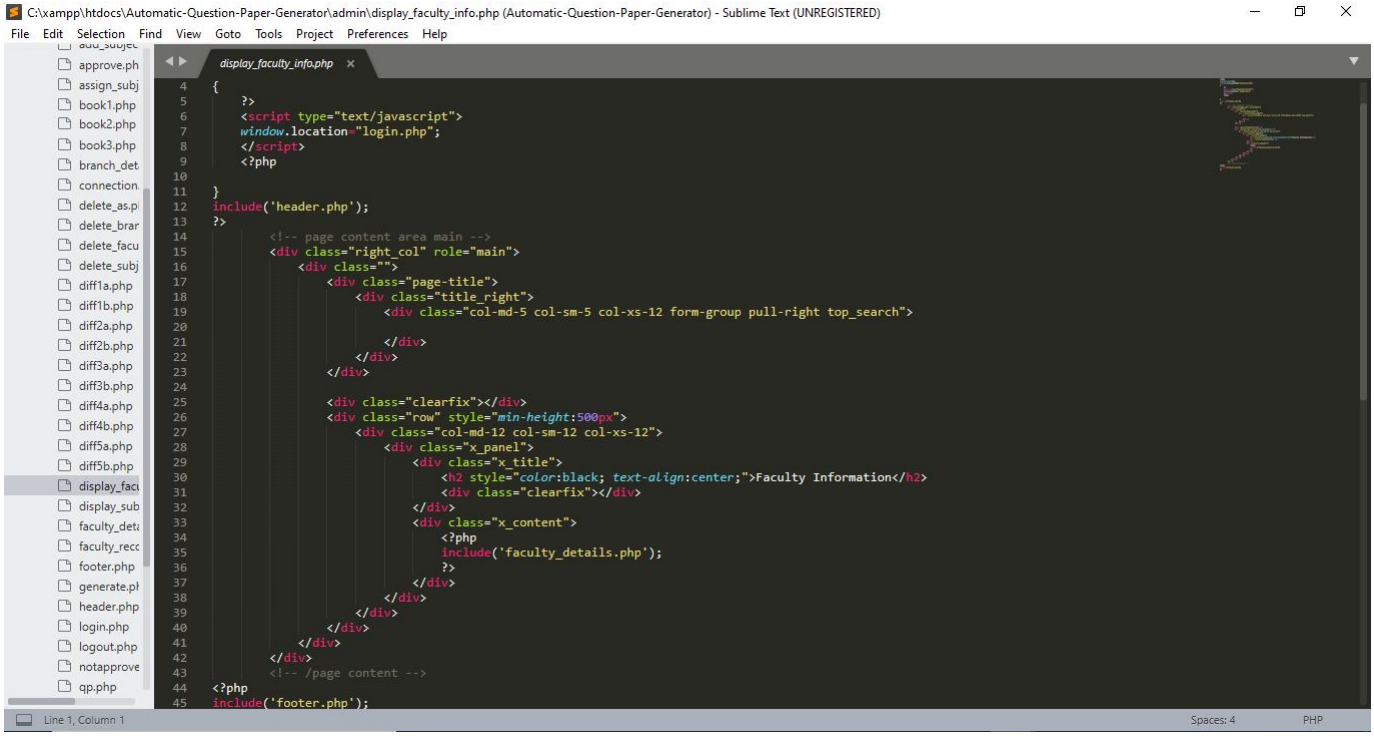


Figure 4.3: display_faculty_info.php

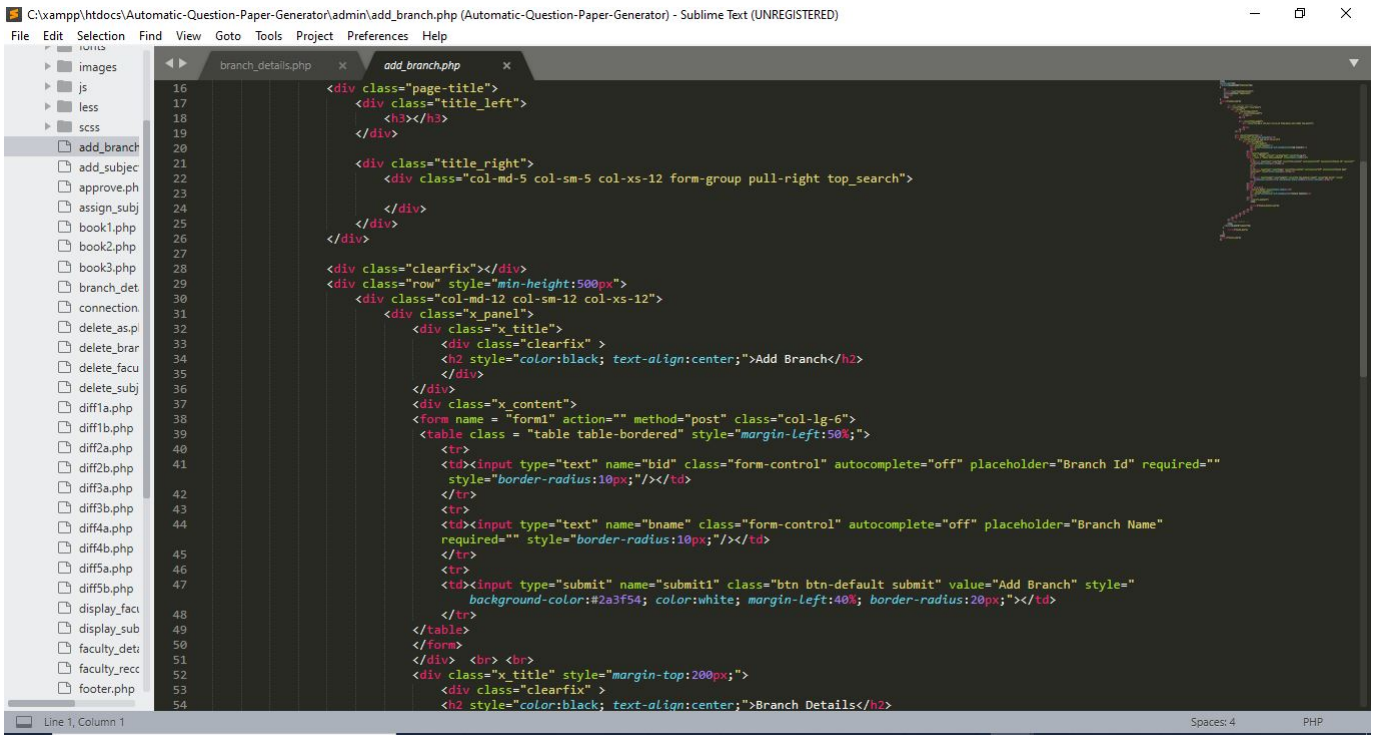


Figure 4.4: add_branch.php

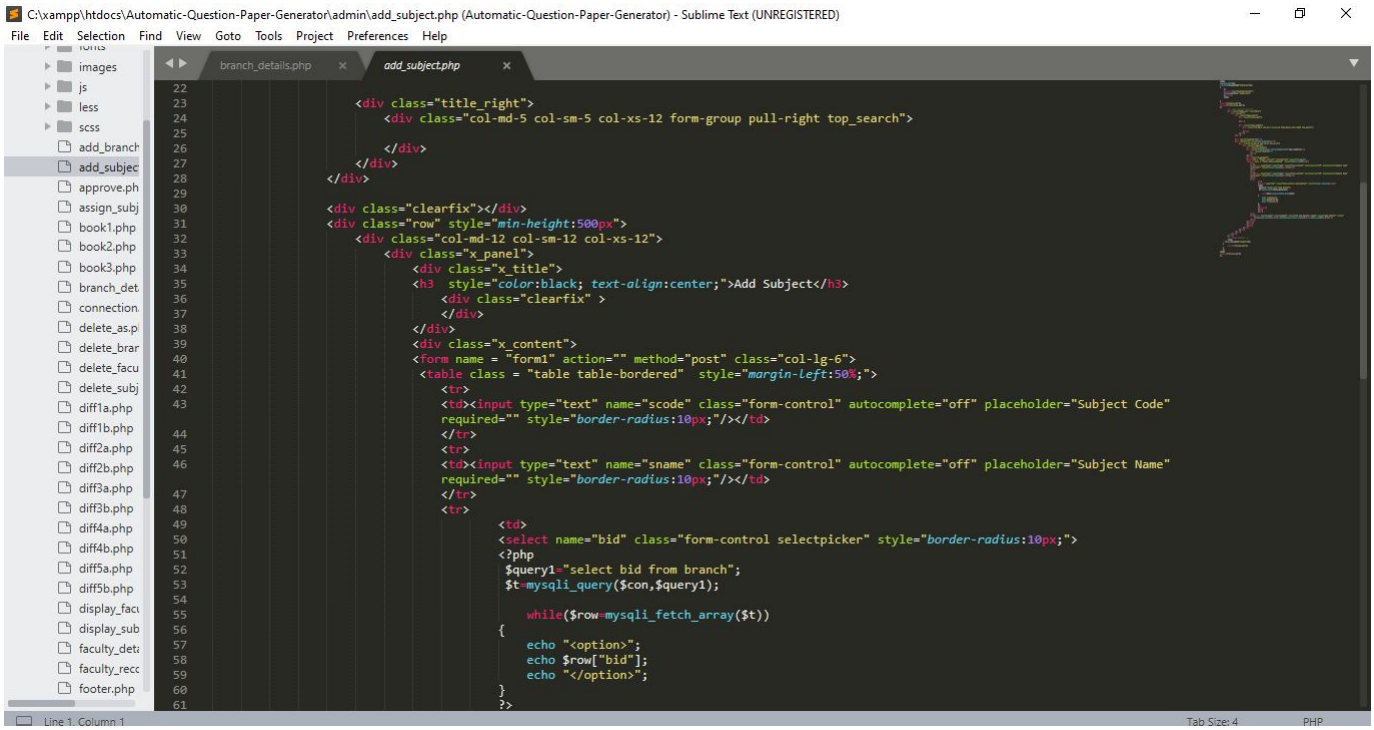


Figure 4.5: add_subject.php

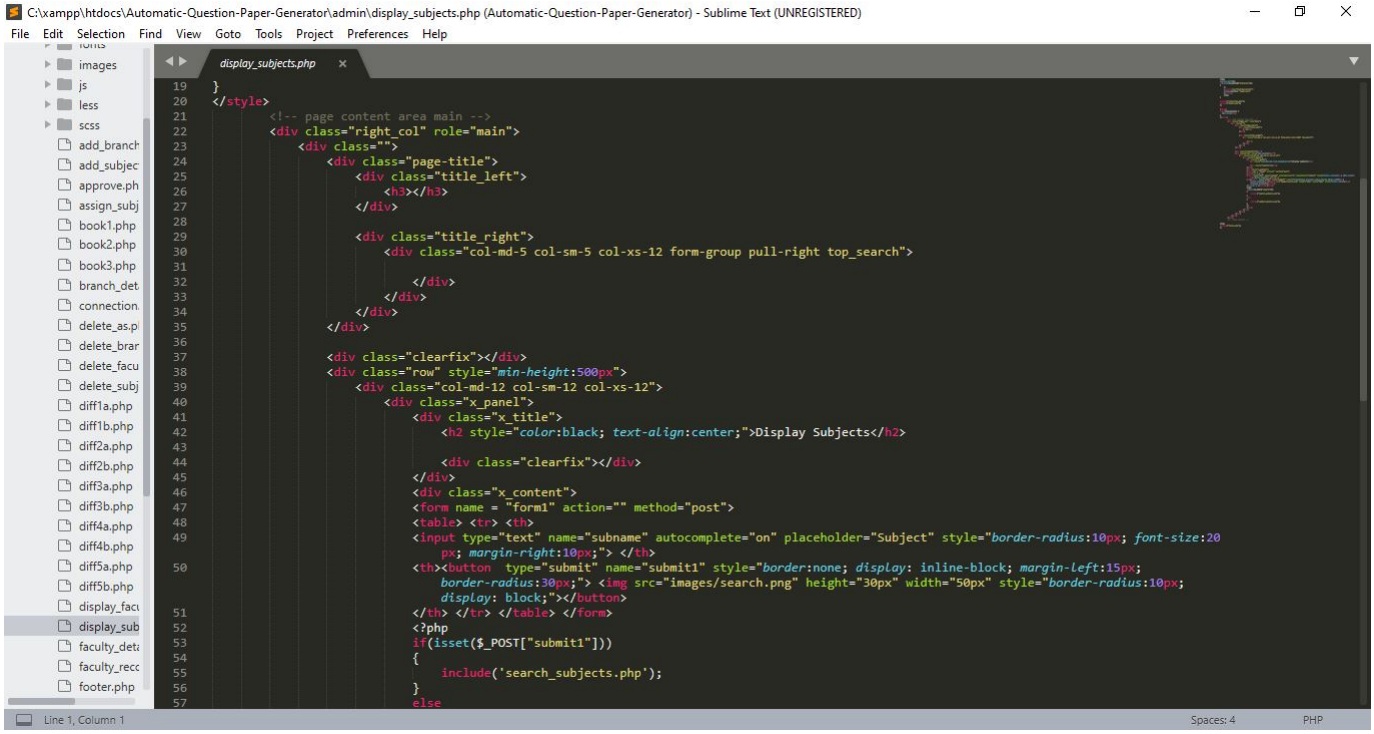


Figure 4.6: display_subjects.php

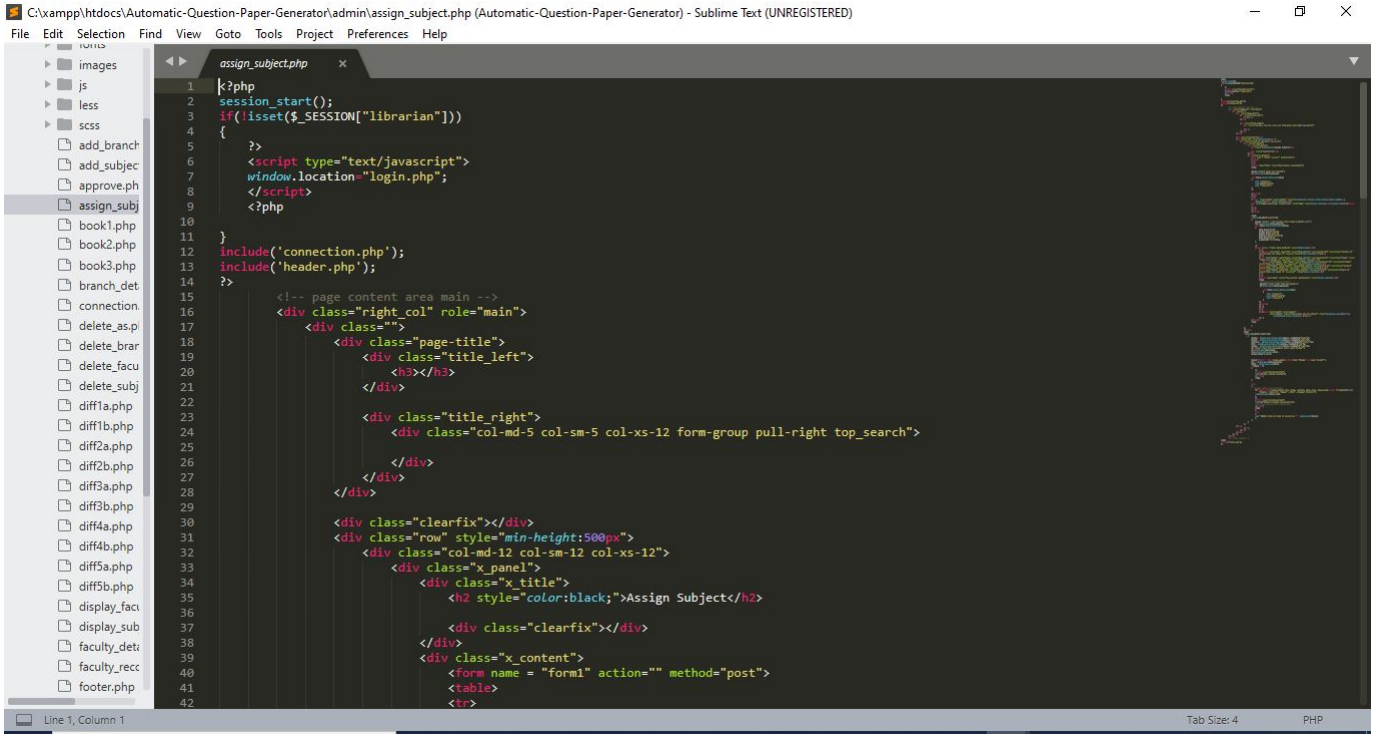


Figure 4.7: assign_subject.php

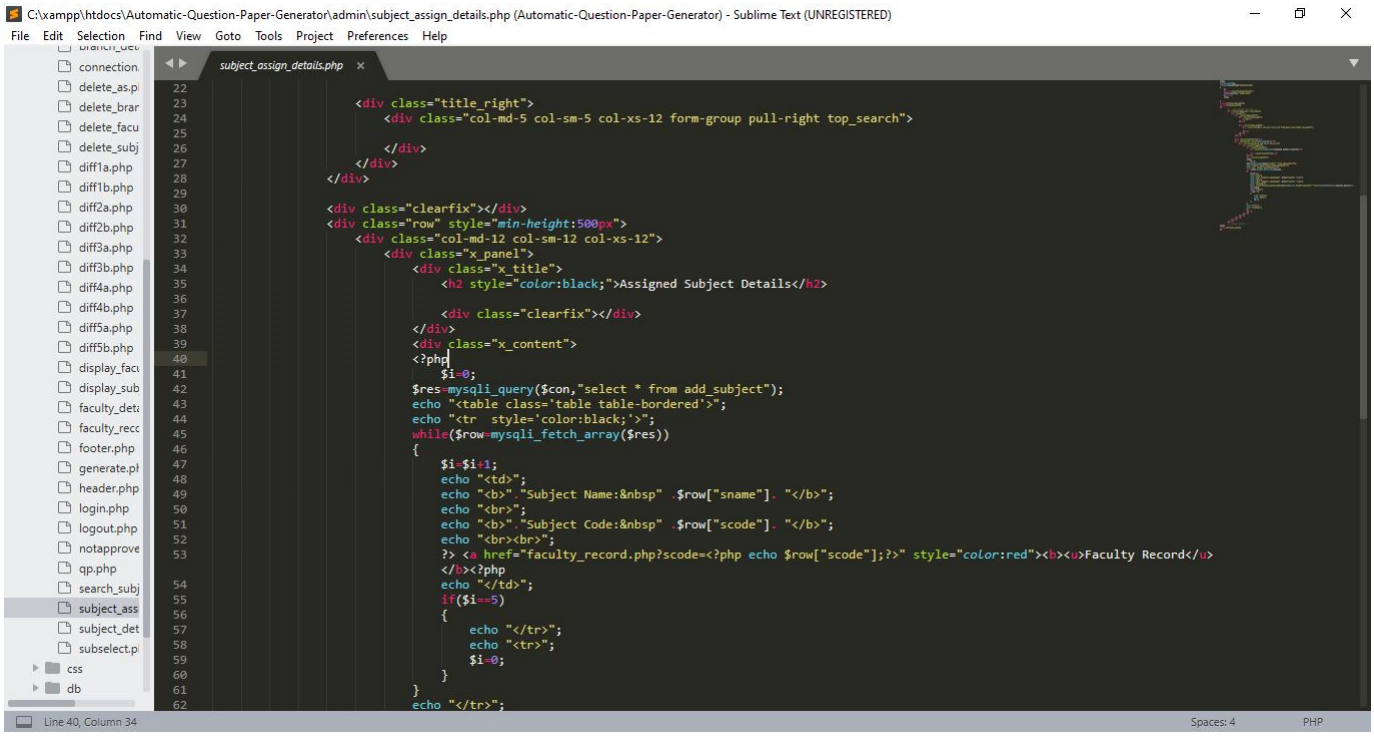


Figure 4.8: subject_assign_details.php

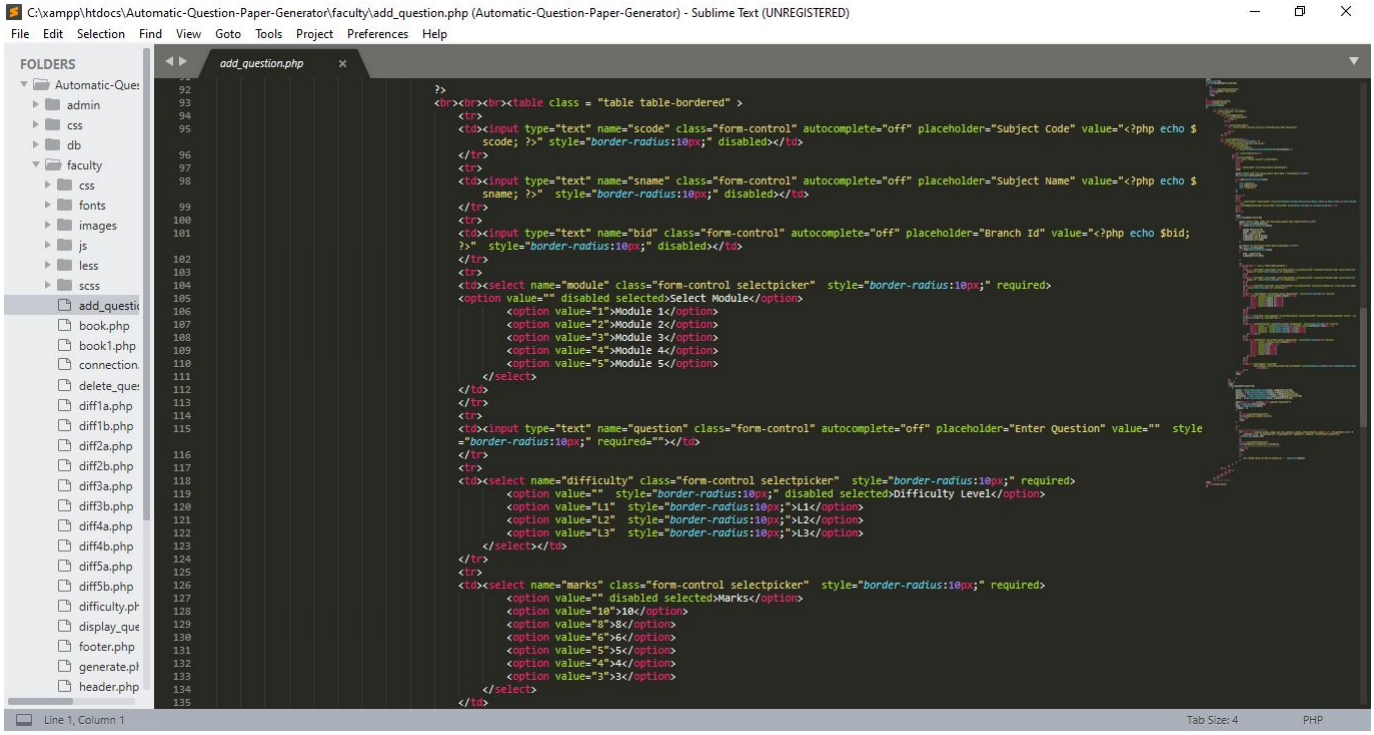


Figure 4.9: add_question.php

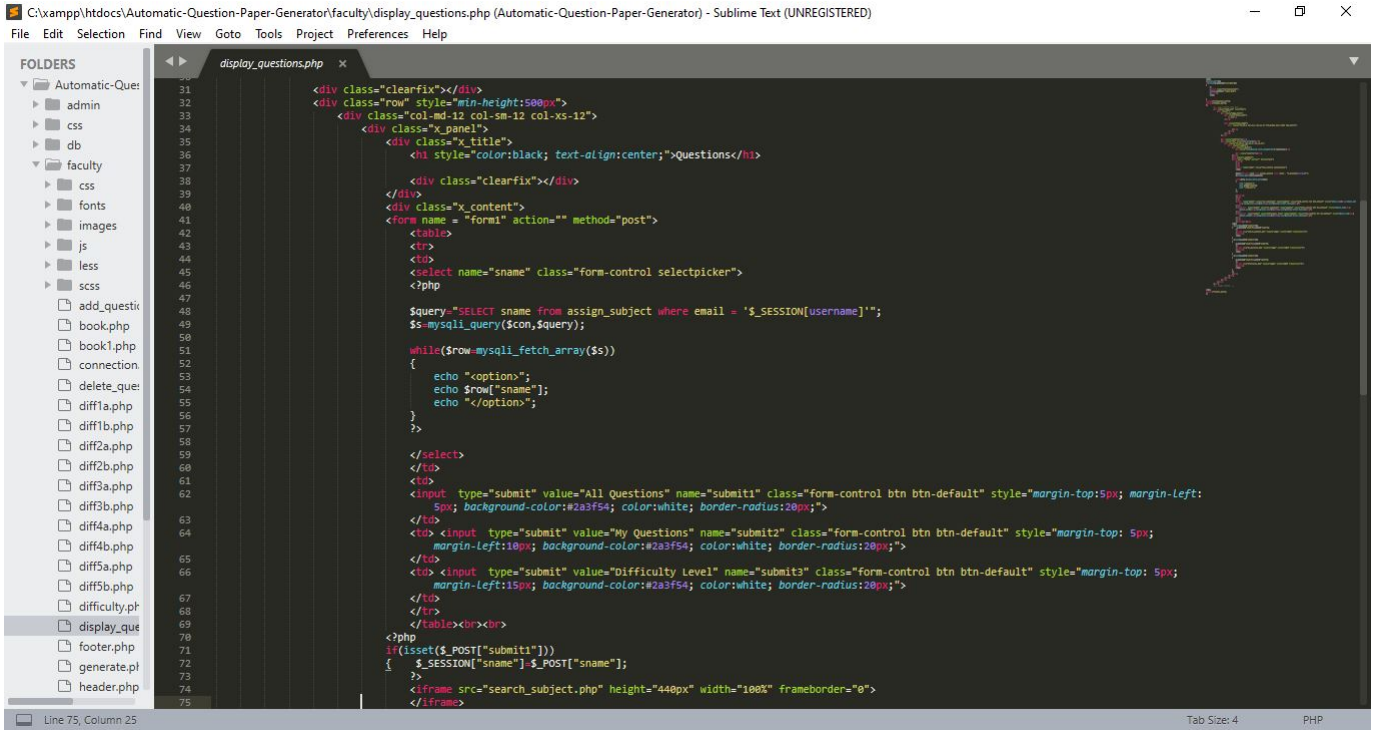


Figure 4.10: display_questions.php

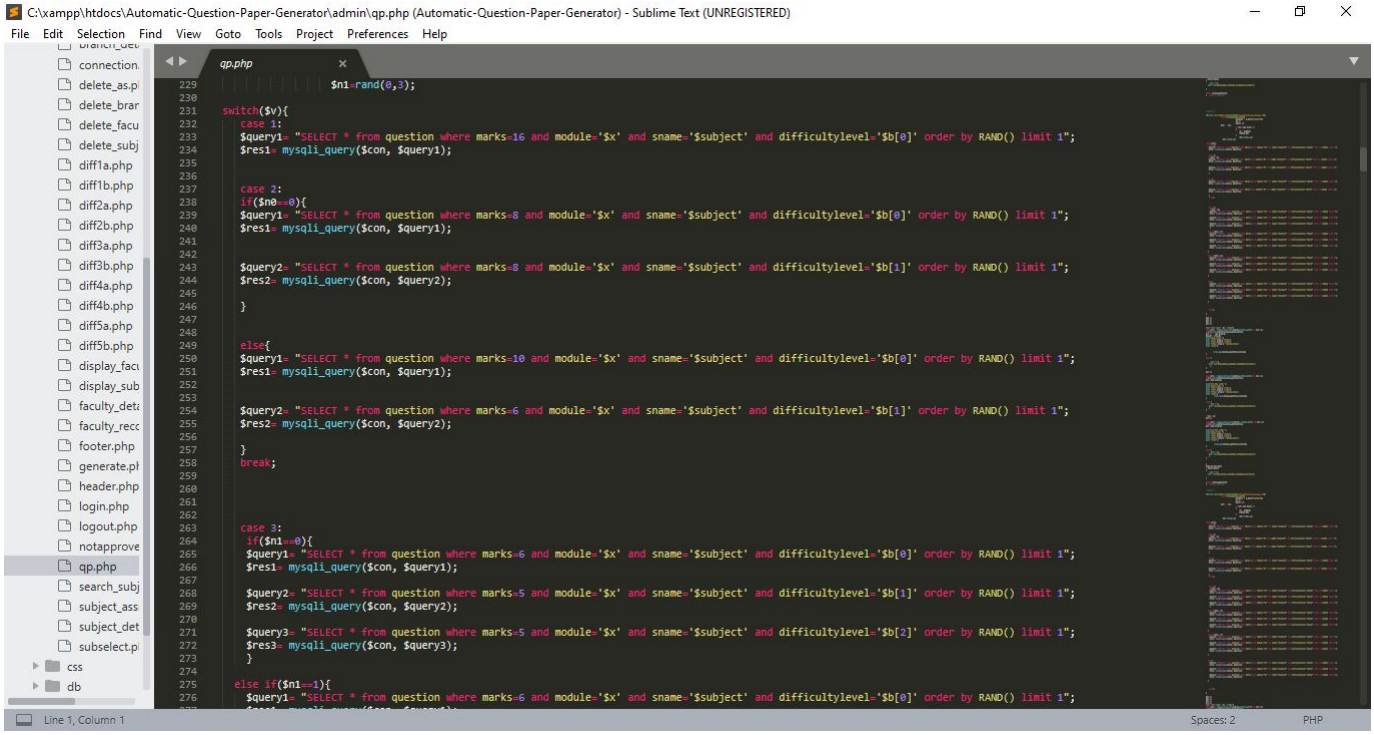


Figure 4.11: qp.php

Chapter 5

Testing

Test No.	Test Name	Expected Result	Actual Result	Pass or Fail
1	All Empty Fields	Enter All the Valid Credentials	Please fill out the Field	Pass
2	Enter Alphabetical Letters in the Phone Number Field	Not Accept Alphabetical Letters	Please Enter valid digits	Pass
3	Not Adding '@' in Email	Not Accept the email	Please include an '@' in email address	Pass
4	Put different passwords in "Password" and "Confirm Password"	Password Mismatch	Password Mismatch	Pass

Table 5.1: Test Case 1: Sign Up

Test No.	Test Name	Expected Result	Actual Result	Pass or Fail
1	Empty User Name Field	Enter Valid User Name	Please fill out this field	Pass
2	Empty Password Field	Enter your Password	Please fill out this field	Pass
3	Incorrect User Name	Incorrect User Name	Invalid Username /Password	Pass
4	Incorrect Password	Incorrect Password	Invalid Username /Password	Pass
5	Correct User Name and Password	Enter Correct Login credentials	Logged in	Pass
6	Approve Faculty	Status changes to Yes	Status changes to Yes	Pass
7	Disapprove Faculty	Status changes to No	Status changes to No	Pass
8	Delete Faculty	Faculty gets deleted	Faculty gets deleted	Pass
9	Display Correct Branch of Faculty	Display Branch of Faculty as entered during Sign Up	Display Branch of Faculty as entered during Sign Up	Pass
10	Empty Branch ID and Branch Name	Please fill out this field	Please fill out this field	Pass
11	Add Branch ID and Branch Name	Display the added Branch Name with Branch ID	Display the added Branch Name with Branch ID	Pass
12	Add Branch Button	Message: Branch Added Successfully	Message: Branch Added Successfully	Pass
13	Delete Branch	Branch deleted	Branch deleted	Pass
14	Empty Subject Code and Subject Name	Please fill out this field	Please fill out this field	Pass
15	Add Subject Code and Subject Name	Display Subject Code and Subject Name	Display Subject Code and Subject Name	Pass
16	Add Subject Button	Message: Subject Added Successfully	Message: Subject Added Successfully	Pass
17	Search Subject	Display searched Subject Name	Display searched Subject Name	Pass
18	Delete Subject Button	Subject Deleted	Subject Deleted	Pass
19	Faculty Record Button	Display assigned Faculty Name	Display assigned Faculty Name	Pass
20	Delete Button	Delete assigned Faculty	Delete assigned Faculty	Pass

Table 5.2: Test Case 2: Admin Module

Test No.	Test Name	Expected Result	Actual Result	Pass or Fail
1	Empty User Name Field	Enter Valid User Name	Please fill out this field	Pass
2	Empty Password Field	Enter your Password	Please fill out this field	Pass
3	Incorrect User Name	Incorrect User Name	Invalid Username /Password	Pass
4	Incorrect Password	Incorrect Password	Invalid Username /Password	Pass
5	Correct User Name and Password	Enter Correct Login credentials	Logged in	Pass
6	Selection of Subject	Should display Subject code, Subject and Branch Name	Displays Subject code, Subject and Branch Name	Pass
7	Add Question	Able to enter the Question and select the Module, Difficulty level and Weightage of Marks	Is able to enter the Question and select the Module, Difficulty level and Weightage of Marks	Pass
8	Add Question button	Should display Question added successfully	Displays Question added successfully	Pass
9	Duplicate Question	Should display message Question already exist	Displays message Question already exist	Pass
10	Display Question	Should display All the questions saved by all the faculties assigned to the subject	Displays all the questions saved by all the faculties assigned to the subject	Pass
11	My Question	Should display all the questions saved by the particular faculty	Displays all the questions saved by the faculty	Pass
12	Update Question button	Should shift to update question page	Shifts to update question page	Pass
13	Update Question page	User should be able to make the changes and then click on update button to save the changes	User is able to make the changes and then click on update button to save the changes	Pass

Table 5.3: Test Case 3: Faculty Login

Test No.	Test Name	Expected Result	Actual Result	Pass or Fail
1	Select Subject and Marks	Should select the subject and marks of the question paper and automatically display the subject code	Selects the subject and marks of the question paper and automatically display the subject code	Pass
2	Question Paper Pattern	Should show the module wise distribution of sections	Displays module wise distribution of sections	Pass
3	Selection of Number of questions	User should be able to select the no. of questions with difficulty level in every module	User is able to select the no. of questions with difficulty level in every module	Pass
4	Generate Question Paper	User should get the generated question paper	User gets the generated question paper	Pass
5	Redundancy	No question should be repeated in question paper	No question is repeated in question paper	Pass

Table 5.4: Test Case 4: Question Paper Generation

Chapter 6

Result

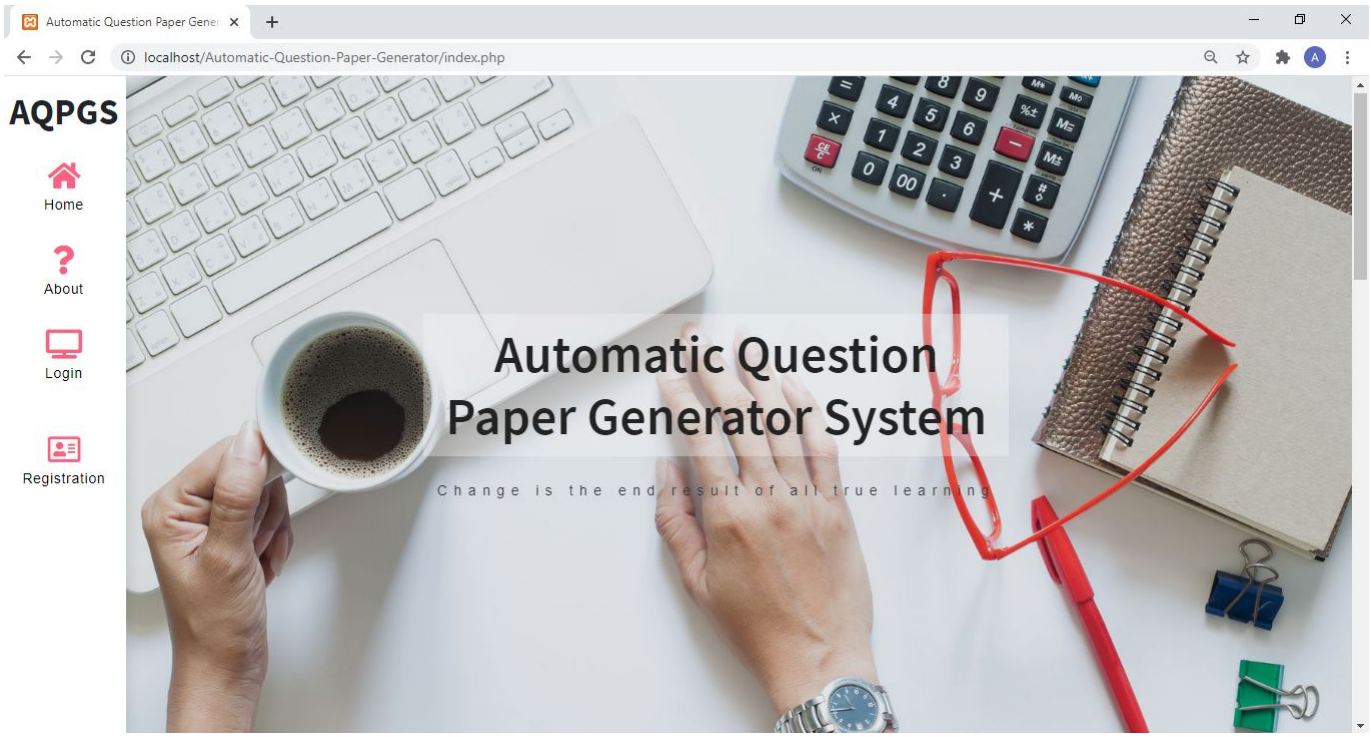


Figure 6.1: Index Page

The above figure is of the Index Page. Any user who needs to Login or Register can do the same by simply clicking on it.

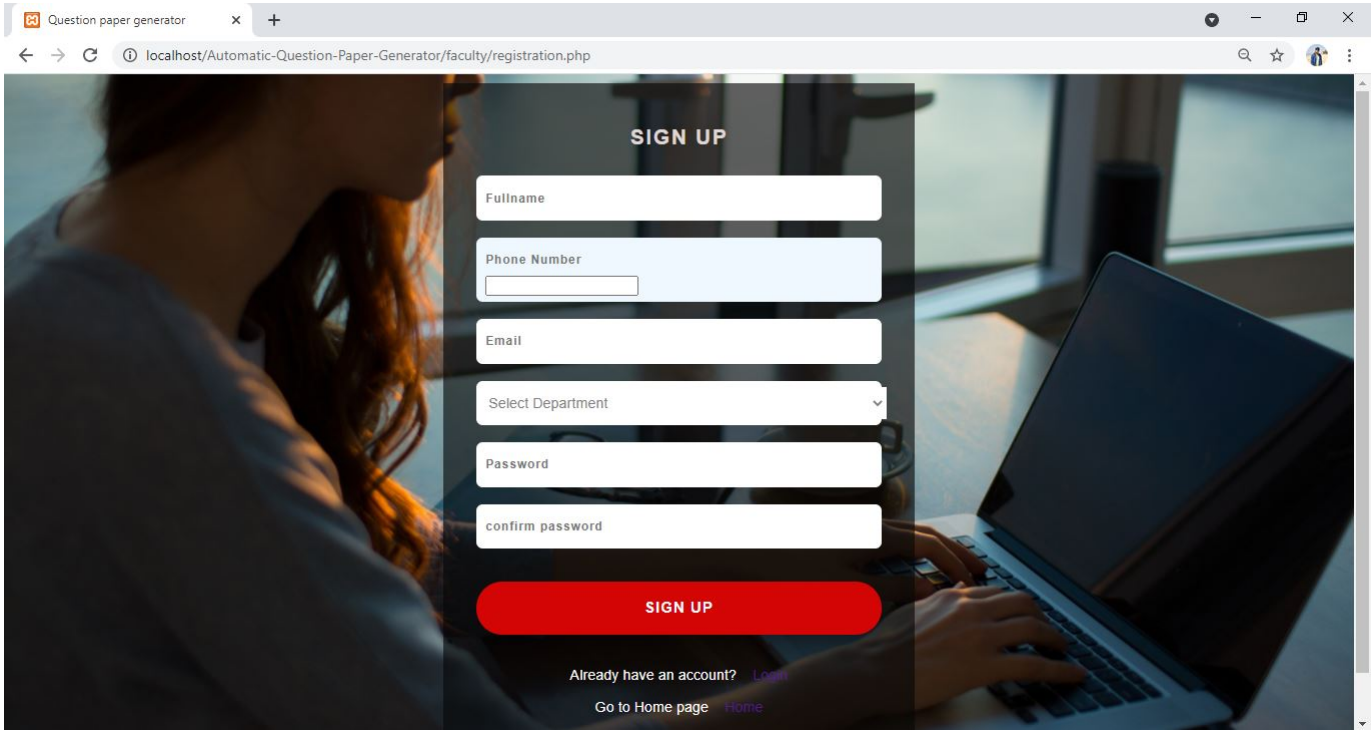


Figure 6.2: Registration Page

The above figure is of the Registration or Sign Up Page. This page is exclusively for Faculty. The Faculty needs to fill in all the details, select the Department which the Faculty belongs to and then click on the Sign Up button. After this the Admin needs to approve the Faculty, then the Faculty will be able to login and access the Faculty portal.

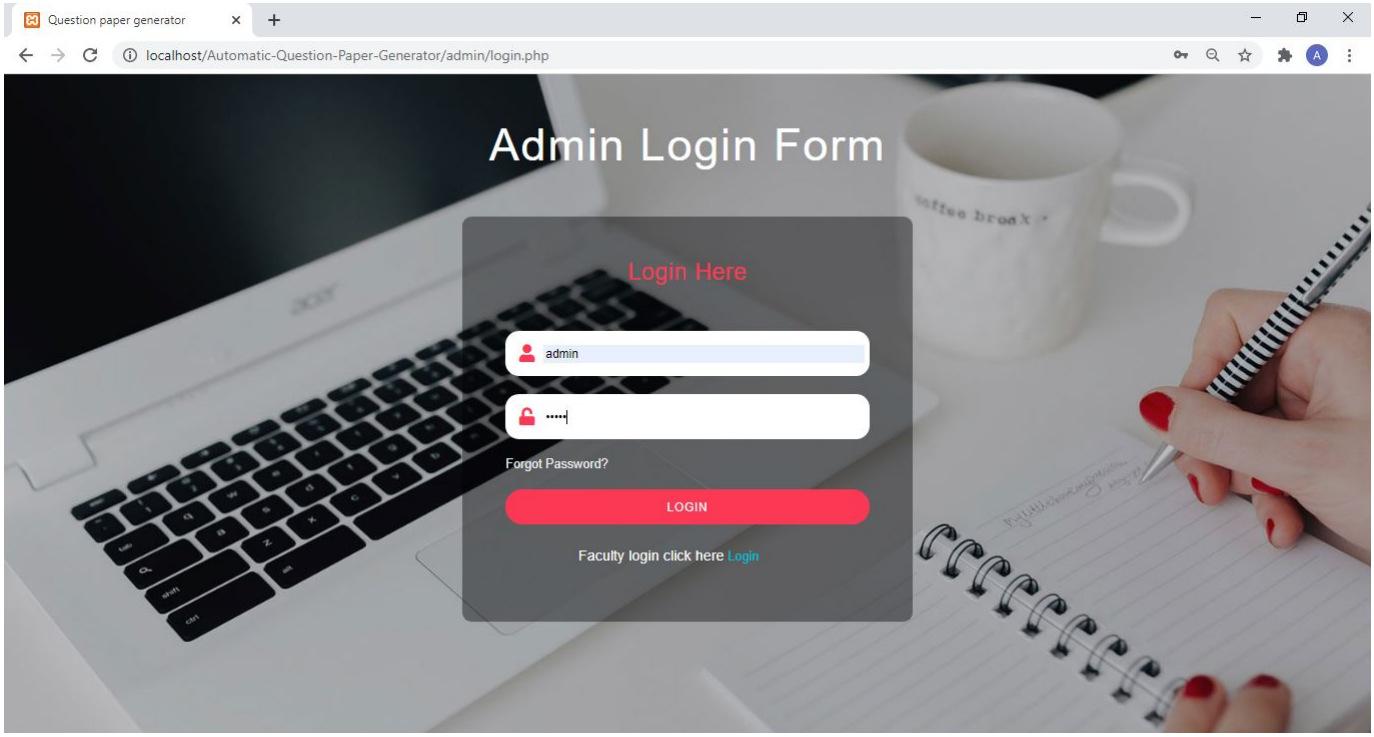


Figure 6.3: Admin Login Form

This is the Admin Login page. The user with the status of Admin needs to enter the username/email and password. Then the Admin will be logged into the Admin portal and can perform the functions of the Admin. The Admin will usually be the Principal of the Institute or Head of Department in the Institute.

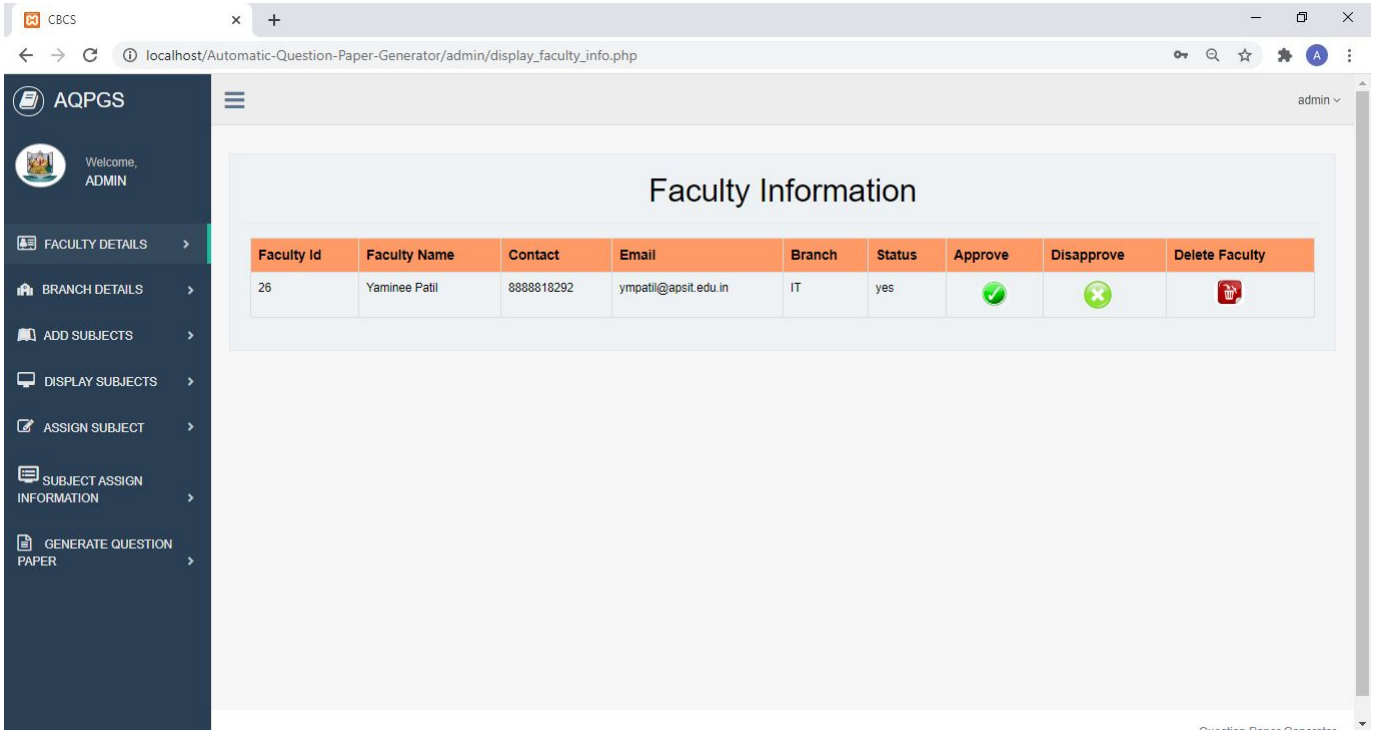


Figure 6.4: Faculty Details

This is the Faculty Details page. In this page the Faculty who have signed up or registered will be displayed in a tabular format. the Admin needs to Approve, Disapprove or Delete the Faculty. If the Admin clicks on the Approve button for the Faculty, then the status changes to Yes. If the Admin clicks on the Disapprove button for the Faculty, then the status changes to No. If the Admin clicks on Delete button, the Faculty gets deleted after the Admin confirms to delete the faculty.

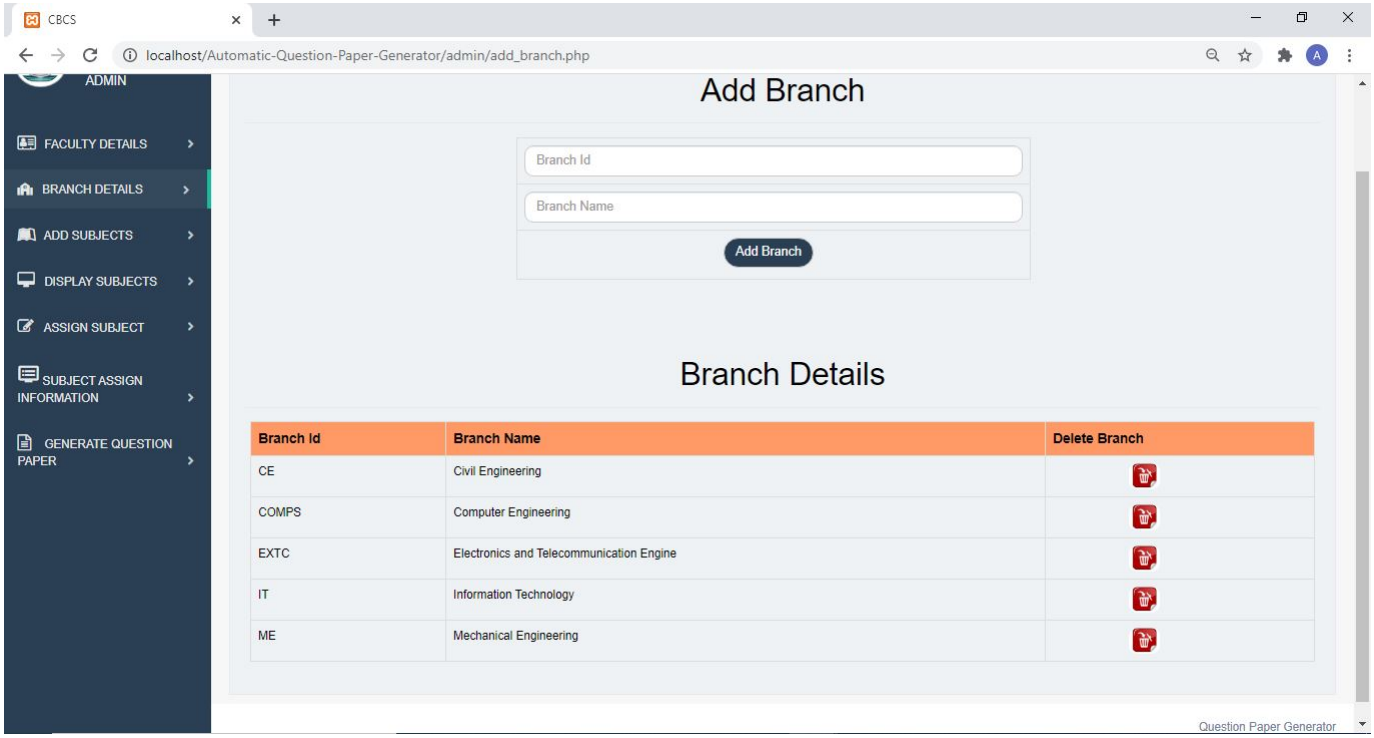


Figure 6.5: Branch Details

This is the Branch Details page. In this page the Admin needs to simply write the Branch Code and Branch Name and click on the Add Branch button. Then a push message appears asking to confirm, when the Admin clicks on OK then the Branch is added and can be visible in the list below. If the Admin needs to delete a particular branch then the Admin needs to simply click on the delete button and then the Branch will be deleted.

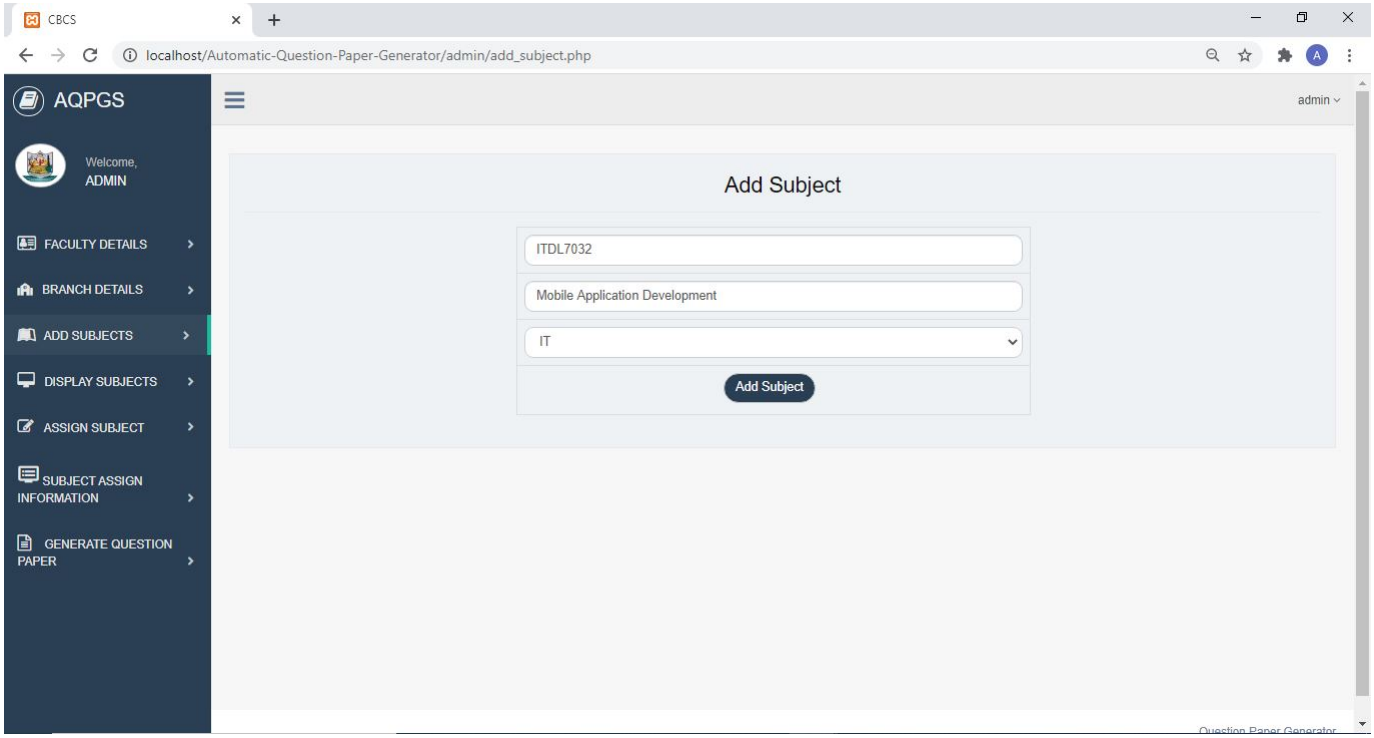


Figure 6.6: Add Subjects

This is the Add Subjects page. In this page the Admin can add subjects in a particular branch. The Admin needs to simply put in the text field, then put in the Subject Name and then select the Branch to which this subject belongs to from the drop down list. after selecting that, the Admin needs to simply click on Add Subject button and then a push message will be displayed conveying **"Subject Insertion Successful"**.

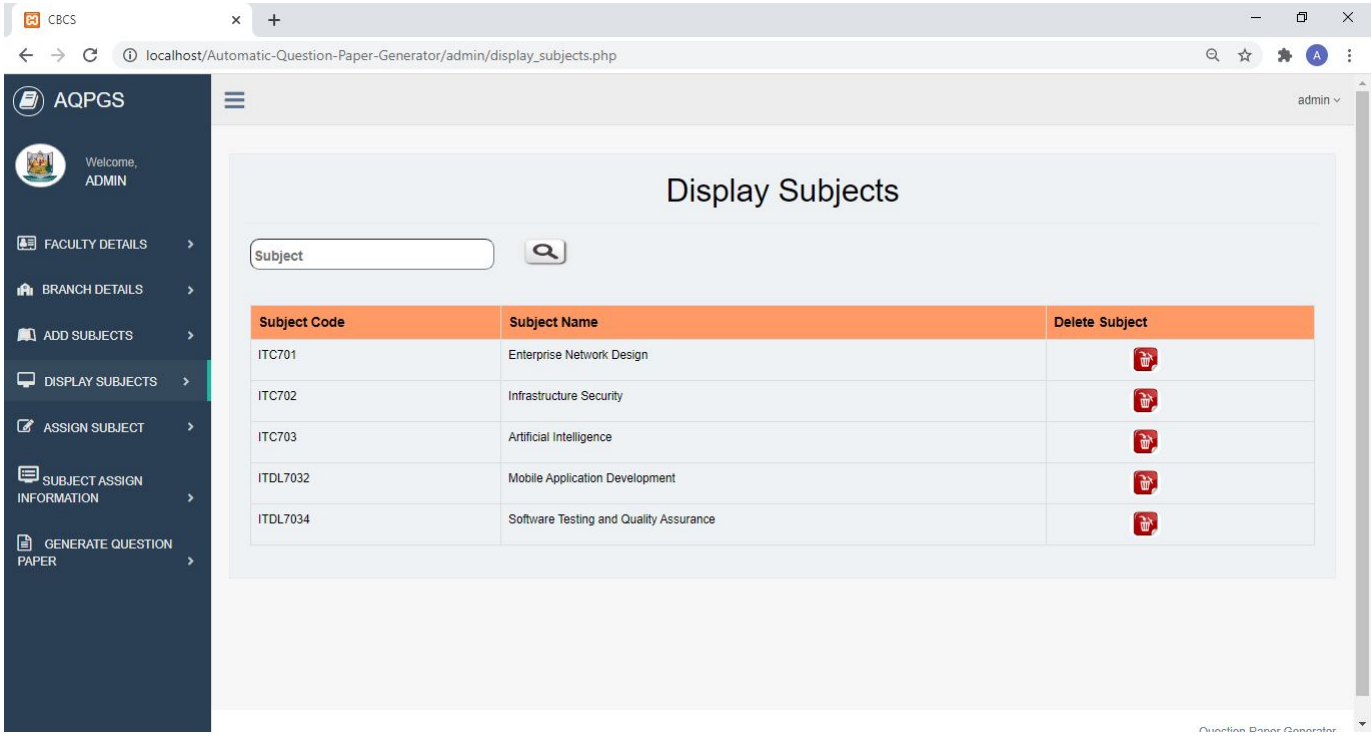


Figure 6.7: Display Subjects

This is the Display Subjects page. Here the Admin can view all the Added Subjects. If an Admin has to search a subject, the admin can simply search the name of the Subject and then the Admin will be able to see the Subject. The Subjects are displayed before the Admin in a tabular form, wherein the Admin can view the Subject Code and Subject Name. The Admin can also delete a particular subject by clicking on the Delete Button, then the Admin will be asked again by a message saying **Are you sure?**, if the Admin clicks on OK, the the subject will be deleted.

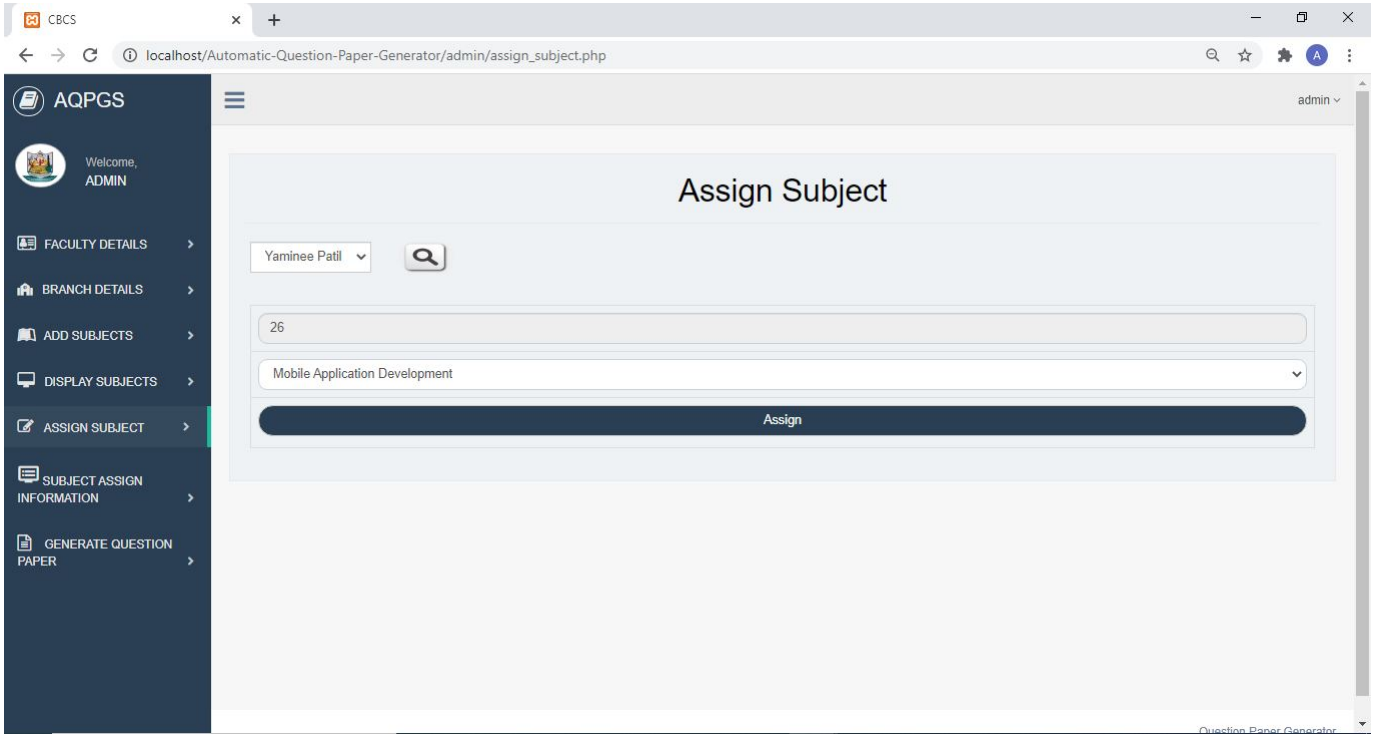


Figure 6.8: Assign Subject

The above page is the Assign Subject Page. In this page the Admin needs to just select the Faculty name from a drop down list. After clicking on the Search Button, the Admin will be able to view the Faculty If of the concerned Faculty and then the Admin needs to simply select the Subject which needs to be assigned to the concerned Faculty. Once the Subject is selected then the Admin needs to click on the Assign button, the an push message will be displayed conveying **"Subject assigned successfully"**.

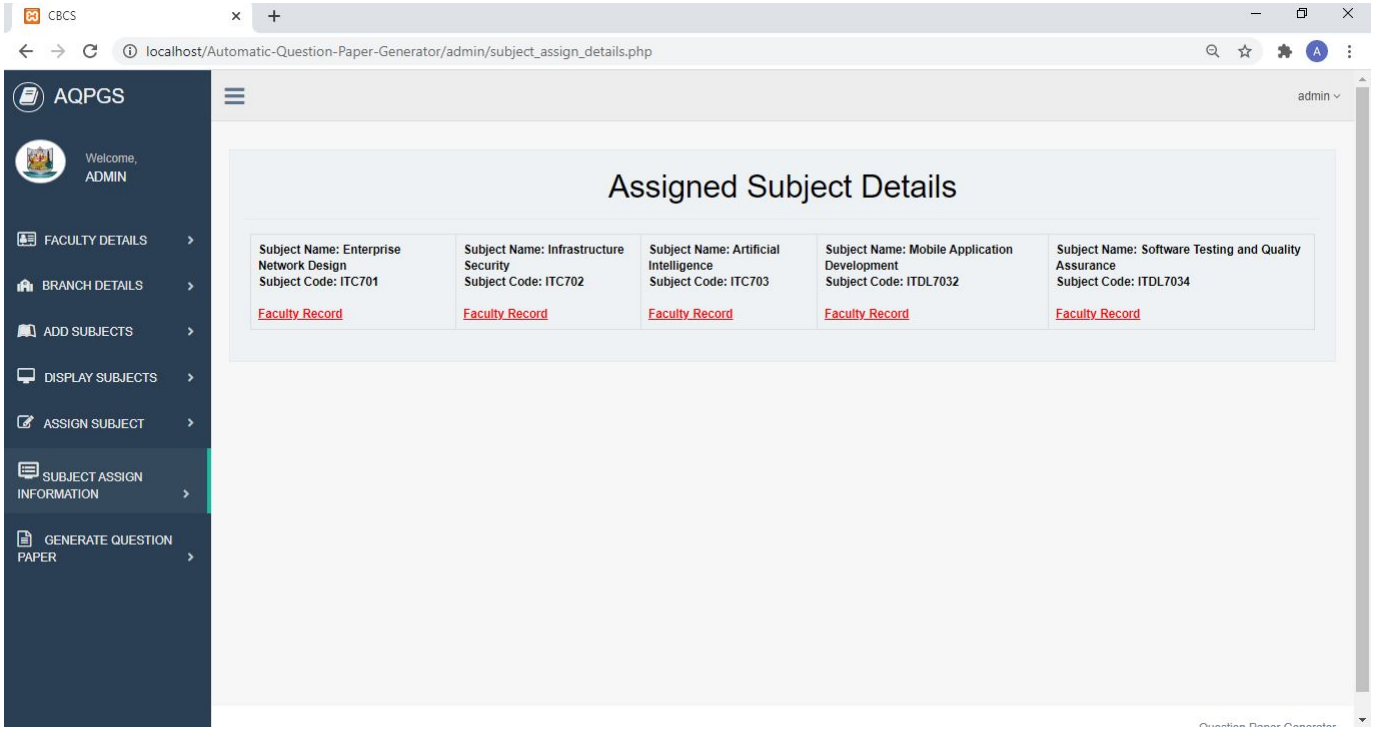


Figure 6.9: Assigned Subject Details

The above picture depicts the Assigned Subject Details page. This page contains the Faculty Record of all assigned Faculties of each and every Subject that is present in the system. Th admin needs to click on the Faculty Record button to see the list of Faculties assigned to the particular Subject.

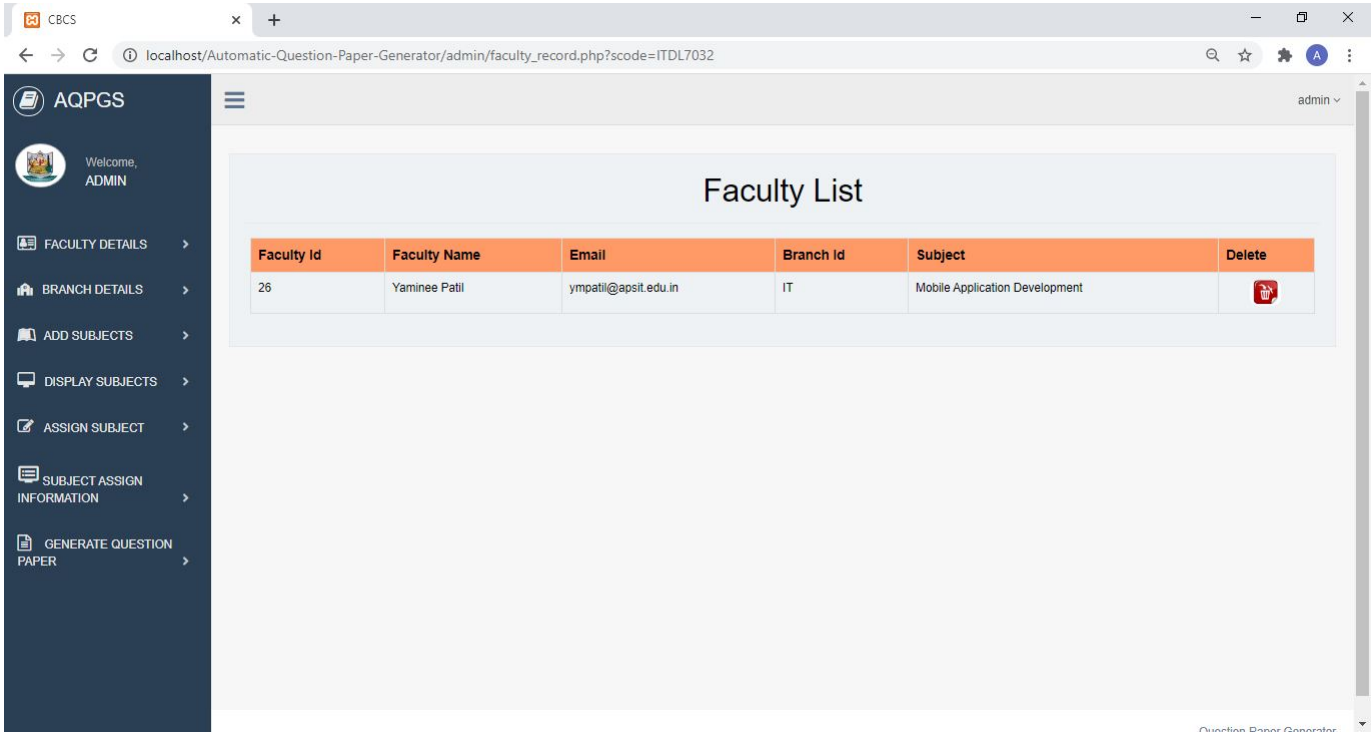


Figure 6.10: List of Subject Assigned to Faculty

As described in the previous figure, the above figure is showing the list of faculties that have been assigned to the particular subject. It is displayed in a tabular form with the 1st column displaying the Faculty ID, the 2nd column displaying the Faculty Name, the 3rd column displaying the email of the Faculty, the 4th column displaying the Branch id of the Faculty and the 5th column displaying the subject name. The last and final column is a delete button and when the Admin clicks on the Delete button the Faculty will no longer able to perform Faculty roles in Faculty portal for the particular subject.

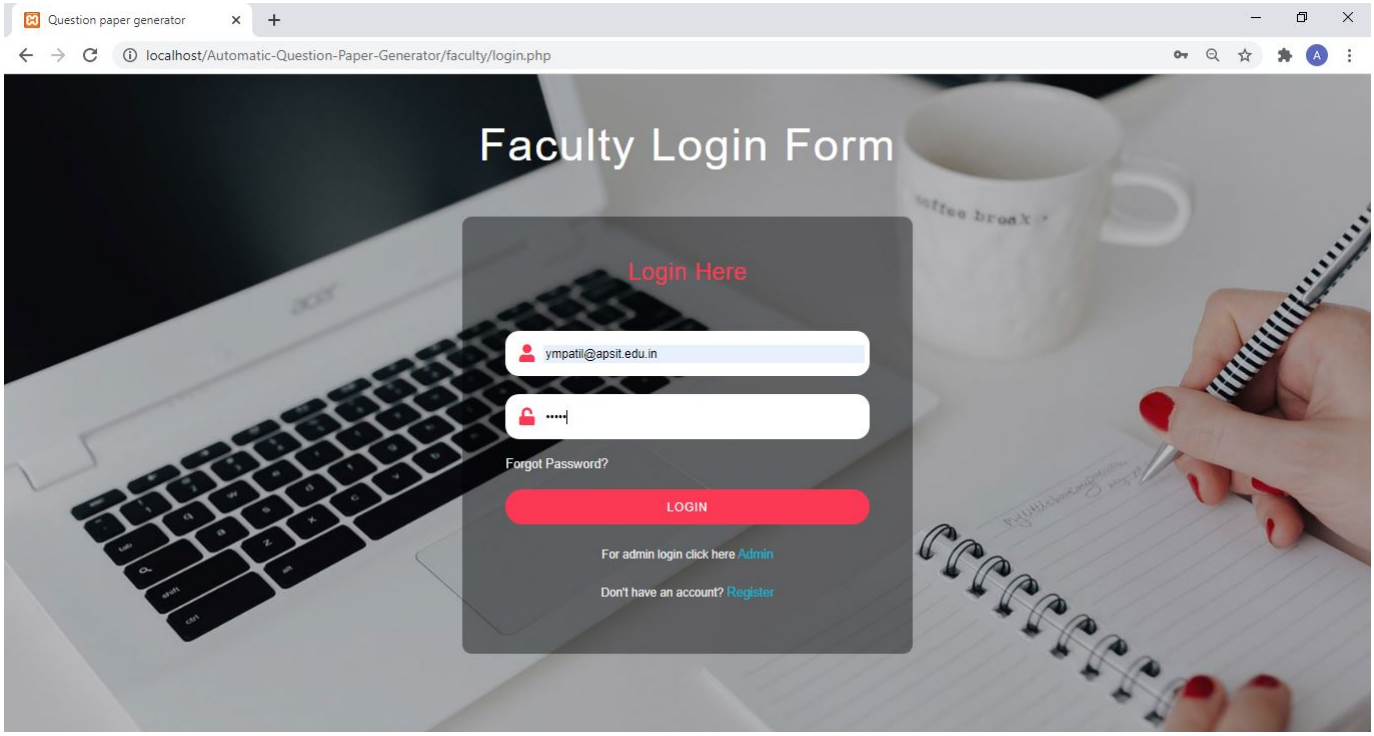


Figure 6.11: Faculty Login Page

This is the Faculty Login page. The user who is approved by the Admin needs to put in the proper username/email and password and then the Faculty will be logged into the Faculty portal.

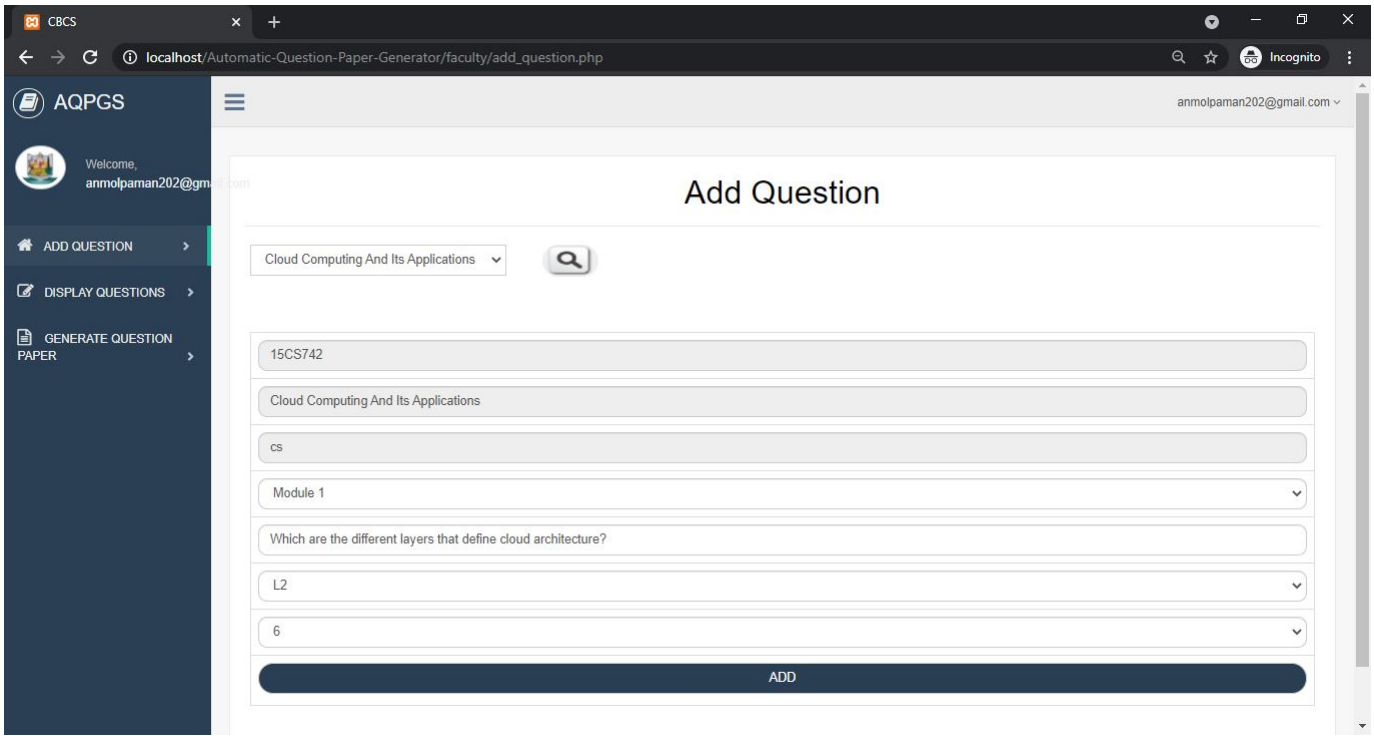


Figure 6.12: Add Question

This is the 1st page of the Faculty portal. This is the Add Question portal. In this the Faculty can add the Question in the Subject assigned to the Faculty. In this the Faculty needs to select the subject from the drop down list. the drop down list consists of subjects assigned to the Faculty, then the faculty needs to click on the search button. Then the faculty will be able to view the Subject code, Subject Name and Branch code to which the subject belongs. Then the Faculty needs to select the module to which the Question belongs. Then the faculty can put in the question in the text field, after that the faculty needs to select the Difficulty level of the question L1 being Easy, L2 being Medium and L3 being Hard and lastly select the weightage marks of the question and then click on ADD button. Then a pop message will display saying **"Question successfully inserted"**. If the question already exists then there will be a message displayed saying **"Question already exists"**.

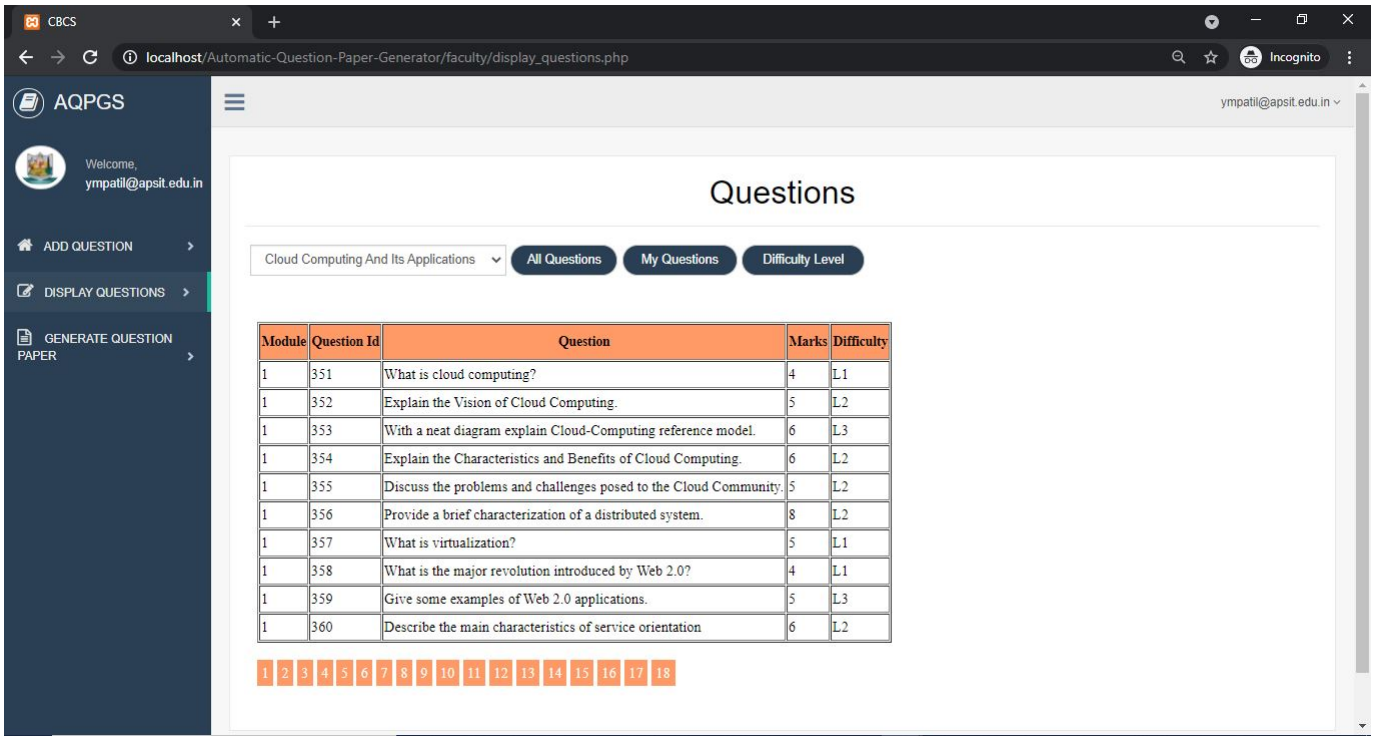


Figure 6.13: Display Questions

The above page is the Display question page. This page is divided into three parts

1. **All Questions** displays all the question added into the subject by the all Faculties assigned to a particular subject.

2. **My Question** displays the questions added by the faculty itself. here the Faculty can update the question as well as delete the question added by the Faculty.

3. **Difficulty Level** displays all the questions saved in the subject and were subject in an ascending order like L1 then L2 then L3.

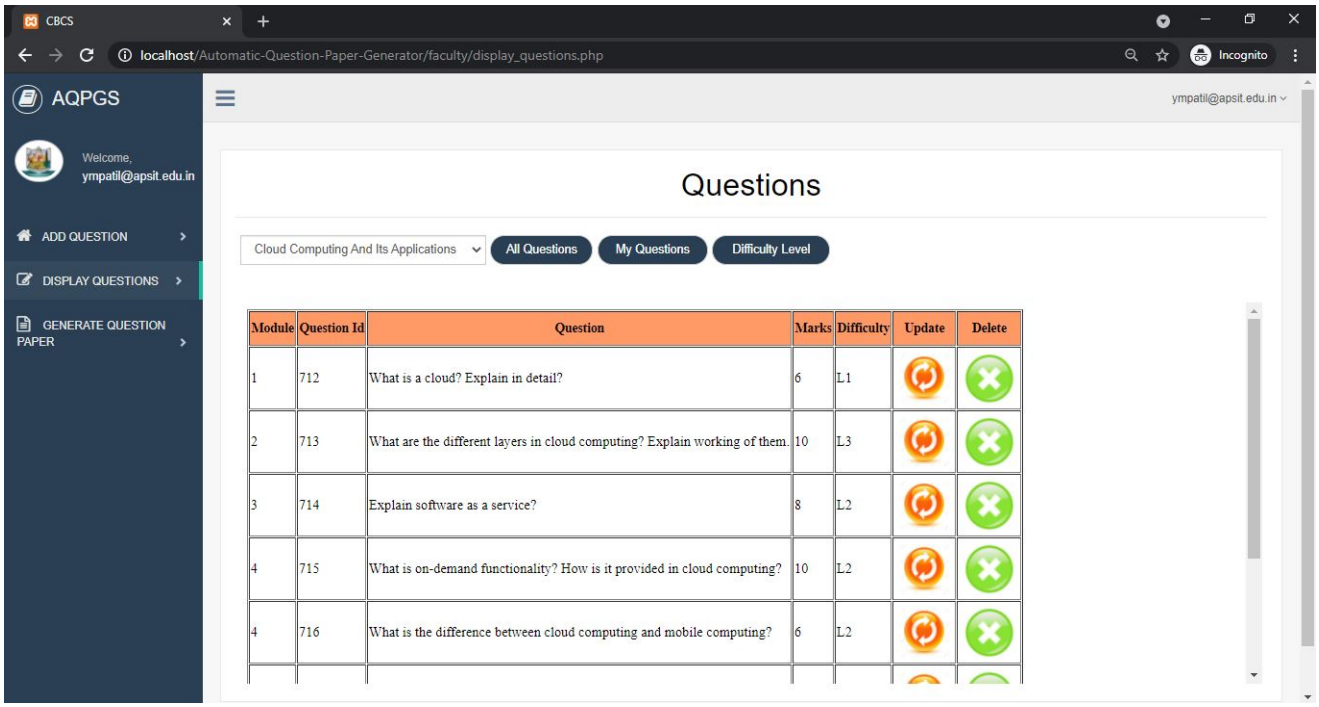


Figure 6.14: My Question Page

The above page is the My Question page. My Question page displays the questions added by the Faculty. the added questions are displayed in a tabular form. The tabular form showcases the Module, the Question id which is auto generated, the question itself, the marks weightage of the question and the level of difficulty of the question, the update question button and the delete question button. When the Faculty clicks on the Update Question button, the Faculty will be taken to the update question page. The Delete Question button will simple delete the question saved by the Faculty.

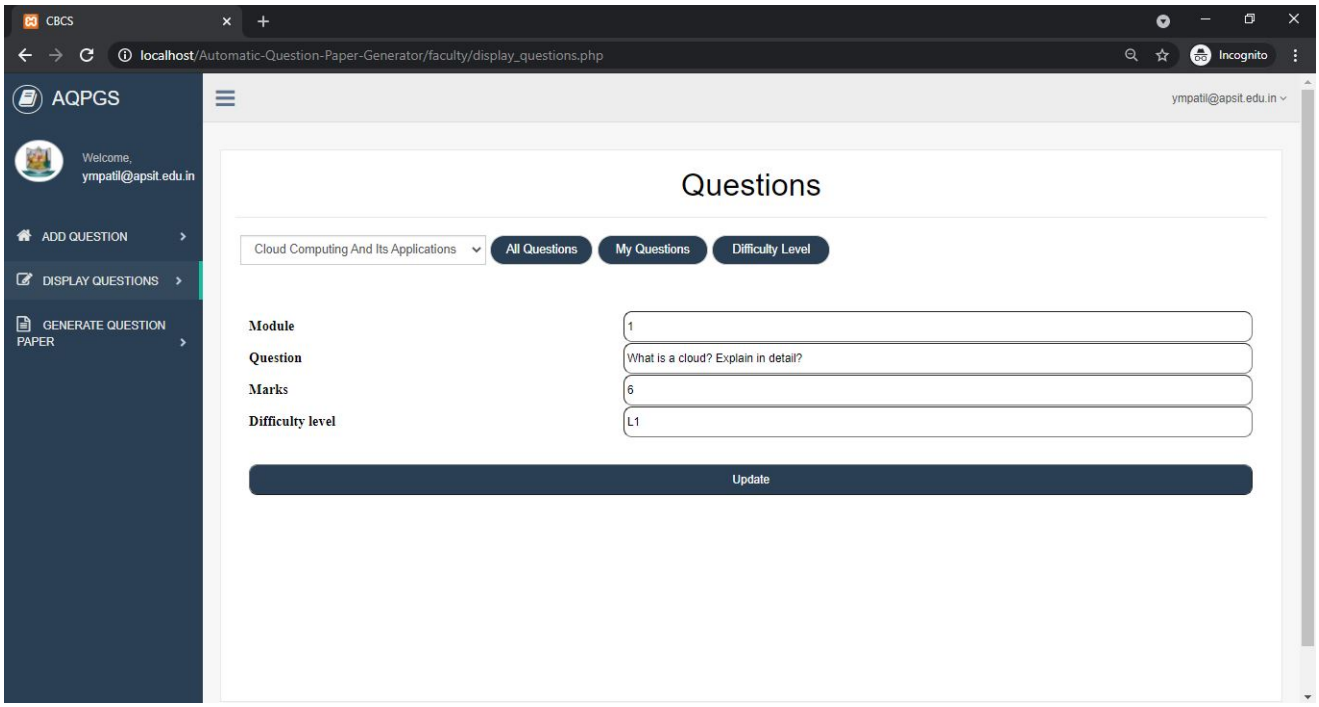


Figure 6.15: Update Question

This is the Update Question page. Here the Faculty can update the question added by them. After making the required changes the Faculty can click on the Update button and the required changes will be made in the backend database.

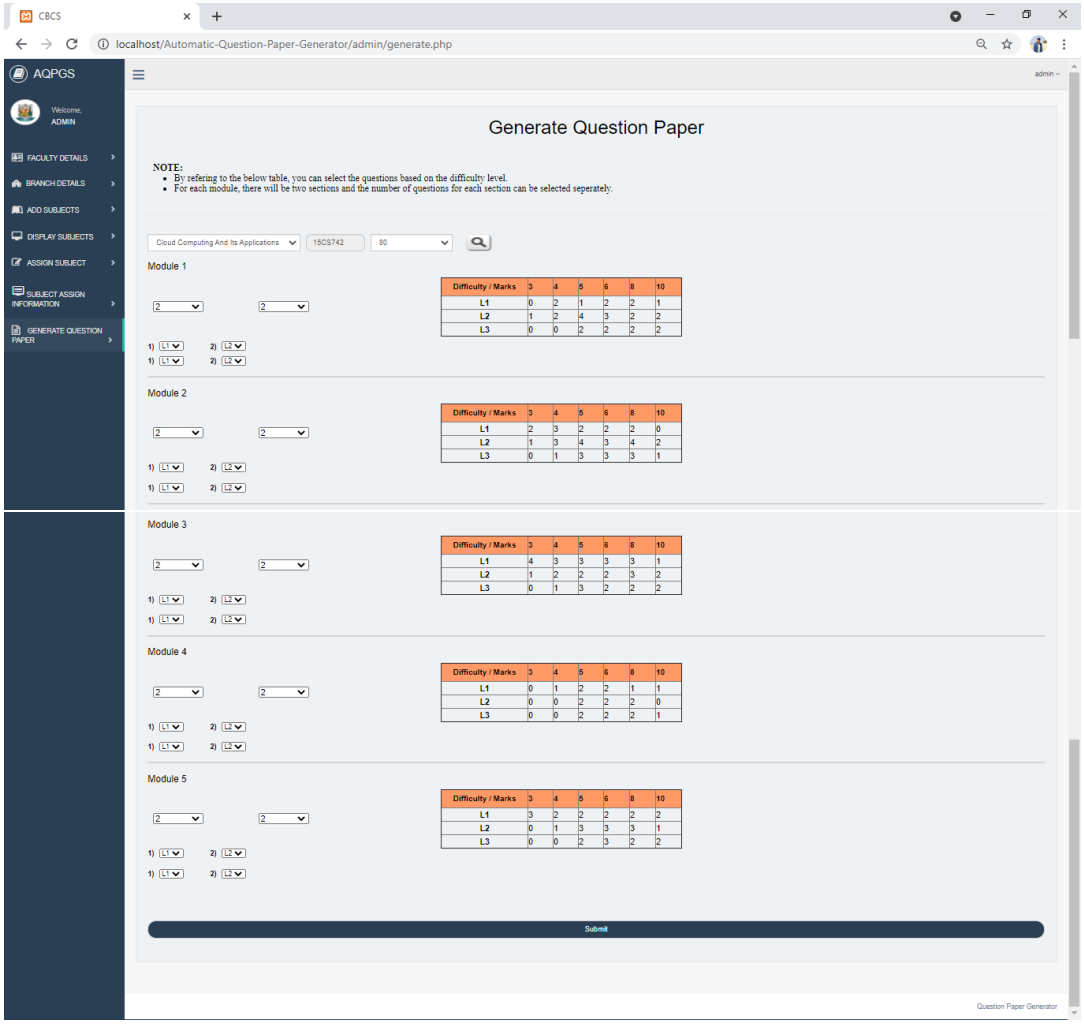
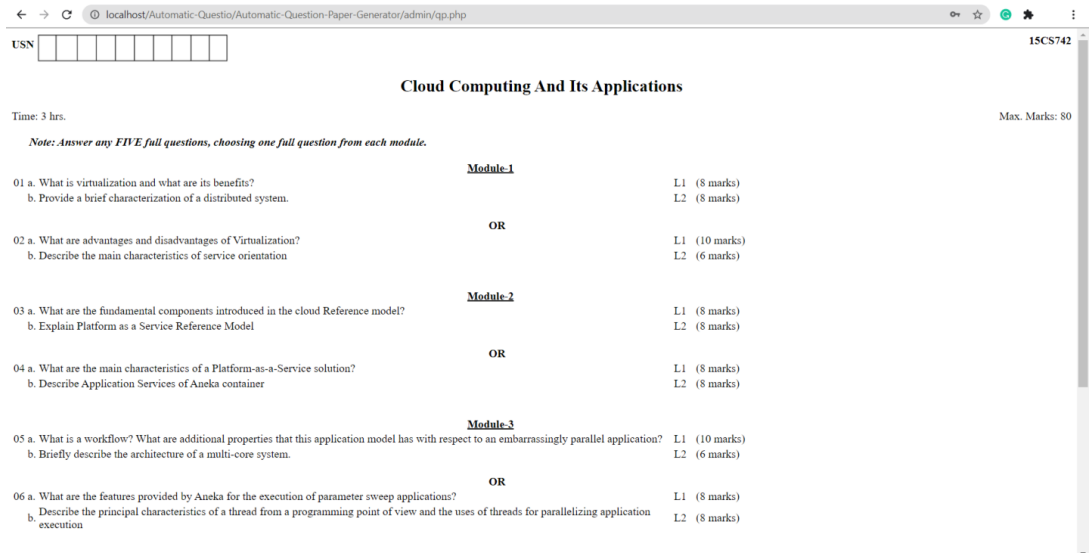


Figure 6.16: Generation of Question Paper

The above figure depicts the process wherein how the Faculty can frame the question paper. Th Faculty needs to select the number of questions needed in each module and also select the Difficulty Level of the question. After selecting it appropriately the Faculty needs to simply click Submit button, the Question Paper will be generated.



localhost/Automatic-Questio/Automatic-Question-Paper-Generator/admin/qp.php

USN | | | | | | | | | | |

15CS742

Cloud Computing And Its Applications

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

01 a. What is virtualization and what are its benefits? L1 (8 marks)
b. Provide a brief characterization of a distributed system. L2 (8 marks)

OR

02 a. What are advantages and disadvantages of Virtualization? L1 (10 marks)
b. Describe the main characteristics of service orientation L2 (6 marks)

Module-2

03 a. What are the fundamental components introduced in the cloud Reference model? L1 (8 marks)
b. Explain Platform as a Service Reference Model L2 (8 marks)

OR

04 a. What are the main characteristics of a Platform-as-a-Service solution? L1 (8 marks)
b. Describe Application Services of Aneka container L2 (8 marks)

Module-3

05 a. What is a workflow? What are additional properties that this application model has with respect to an embarrassingly parallel application? L1 (10 marks)
b. Briefly describe the architecture of a multi-core system. L2 (6 marks)

OR

06 a. What are the features provided by Aneka for the execution of parameter sweep applications? L1 (8 marks)
b. Describe the principal characteristics of a thread from a programming point of view and the uses of threads for parallelizing application execution L2 (8 marks)

Figure 6.17: Generated Question Paper

This is the final generated paper after performing all the steps above.

Chapter 7

Conclusions and Future Scope

Assessment plays a vital role in teaching, learning process and aligning assessment to the learning outcomes of the course is an important aspect. Question selection difficulty has been modeled as a multi-constraint optimization issue that aims at generating question papers fulfilling many constraints said by the paper setter. The implemented system tries to address the above mentioned issues in an efficient way. The implemented work narrates an automated system that heads away from the traditional process of paper generation to an automated process. This system simplifies the whole process of question paper generation.

Our future effort is to employee different types of randomization techniques as well as addition to Question Generation, we can enhance the same software by making provision to produce question for online test in an Multiple Choice Question format. The next effort would be to put in Machine Learning algorithms which will further help to identify if the generated Question Paper fulfils all the Course Objectives or not.

Bibliography

[1] BLOOM'S TAXONOMY-BASED EXAMINATION QUESTION PAPER GENERATION SYSTEM by Yulia Timakova FTMS College Malaysiajuliati095@gmail.com, Kinn Abass Bakon FTMS College MalaysiaKinn@ftms.edu.my. International Journal of Information System and Engineeringwww.ftms.edu.my/journals/index.php/journals/ijiseVol. 6 (No.2), November, 2018ISSN: 2289-7615DOI: 10.24924/ijise/2018.11/v6.iss2/76.92

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[4] http://www.ijtre.com/images/scripts/2017040978

[5] https://ieeexplore.ieee.org/document/7814813

[6] https://ieeexplore.ieee.org/abstract/document/6530119

Publication

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