The Development of a Web-based Application of Examination Seating Arrangement for Student

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Abstract: *The paper presents a web-based application (App) that can be used to solve the problem of "giraffing" in an examination environment by ensuring that students offering the same course are not seated together. The implementation of the algorithm into the process of coding the seating generation modules was done with the use of object-oriented programming available in newer versions of PHP. The coding and design of the seating arrangement module to take multiple courses and assign them in all the classes selected was sorted out by multiple increments . Nowadays we want everything to be done easily. As we are progressing in the technology, we are also looking for advancement in the in life as we don't want to waste our time in meaningless thing. So we try to shorten the time for some work using software such as recording data in electronic devices so that we don't have to write again if lost.*

Our project is to make "EXAM SEATING ARRANGEMENT" project website, so that it can computerize the exam hall data. It helps in generating the exam hall seating arrangement plan for smooth conduction of exams. It helps in accessing the examination information of particular student in a particular class. This system automizes the existing system for exam seating arrangement.

1. INTRODUCTION

Examination malpractice is regarded as any process of exploiting wildcat methods to get unjustified advantage in an examination or test with the aim of achieving success. It may include cheating before the examination .

Every educational institution has examination held at particular intervals. A software application is necessary for exam seating arrangement during examination process. It can help the student to find their respective examination hall and seat allotted to them. The purpose for developing this system is to computerized the manual exam seat allocation to lighten the burden on the staff. Another purpose of developing this software is to help student guide to the respective examination hall during exam.

The major modules in this application are: -

- Student Details
- Exam Schedule
- Admin Details
- Seat Allocation

The coming of electronic cheating has also contributed to the problems of carrying out believable and unquestionable examinations; consequently, a holistic approach; which will involve all stakeholders, and the use of technological, and non-technological solutions, must be come up with to deal with this behemoth.

In order to prevent education sector from ruins due to examination misconducts, various suggestions have been proposed by education and technological researchers. For instance, has identified three main approaches that can be used in curbing examination malpractice. These include: Ethical, Engineering and Enforcement approaches. One of the ways of applying ethical approach proposed by, according to is by inculcating honesty and discipline into students. During the examination, candidates present their cards and the verification of personality and legitimacy to write a particular

examination is confirmed. This procedure, despite being quite efficient is only able to solve the problem of student impersonation.

In order to reduce complications in the allotment of examination rooms and issuing of examination dockets to examinees during examinations, therefore proposed an examination hall and seating arrangement application using PHP. The docket is used in establishing the eligibility criteria of an examinee of a given department. The App proposed by can only provide a way to apportion examination room for each examinee less any skirmish.

In this work therefore, a web-based examination seating arrangement application (App) is developed and proposed. The proposed App created a web-based software program that arranges students sitting for examinations in an examination hall such that no two students offering the same course are in close proximity to each other. This will help eliminate the problem identified above.

2. METHODOLOGY

2.1 Problem Formulation

The proposed App arranges students sitting for examinations in an examination room in such a way that no two students offering the same course are in close proximity to each other. It is a graph colouring and the k-partitioning problem; where the vertices of a chart are coloured in such a way that no two neighbouring vertices divvy the same colour. A basic graph colouring example is shown Figure 1.

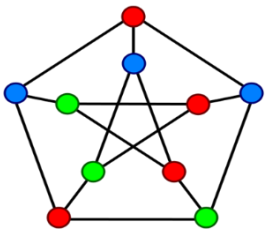


Figure 1: A basic graph colouring

The problem is likened to dividing n number of students among k number of seats available in an examination venue for different types of papers to be taken over a given period in a day To achieve this goal, the proposed App will have to meet the following objectives:

- Students offering different courses should be seated on the same seat or adjacent to one another;
- The number of students on each seat should be same.

There are many algorithms that can be used to solve the problem at hand like the Tabu Colony, Partial Colony, Greedy, Degree of Saturation, Hybrid Evolutionary, Ant Colony, Hill-climbing, Backtracking , and Harmony Search algorithms. In this contribution, the Harmony Search Algorithm (HSA) is used because of its simplicity and search efficiency .

2.2.1 Program

The implementation of the algorithm into the process of coding the seating generation modules was done with the use of object-oriented programming available in newer versions of PHP. The PHP is deployable in this contribution because it can be used on many web servers and operating systems; and can be used with many relational database management systems (RDBMS).

Figure 2 presents a sequence diagram for the App, which shows how the four essential objects that are involved in operations of the App are sequentially arranged, and their timely interactions. It is evident from the figure that the App is

linked to the database, Administrator (Admin), and printer. The function of the database is to hold the details of students' information, various halls for examinations, and courses to be examined in the examinations. The needed students' information includes; names, matriculation numbers, and list of registered courses for the examinations. The Admin has shown in the figure, creates or updates the data in the database. He instructs the App to generate the seating arrangements; and also gives details of what the App is to be done after it generates the seating arrangements, either to only view or print the generated seating arrangements. In a situation where there is need to print the seating arrangement.

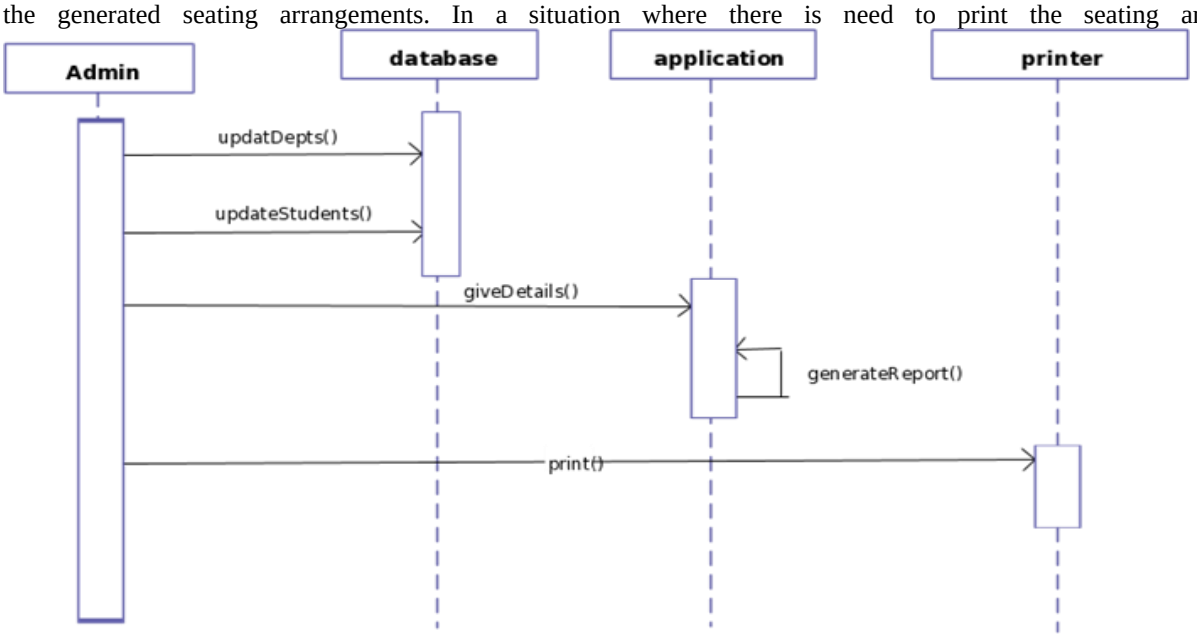


Figure 2 Sequence diagram for app

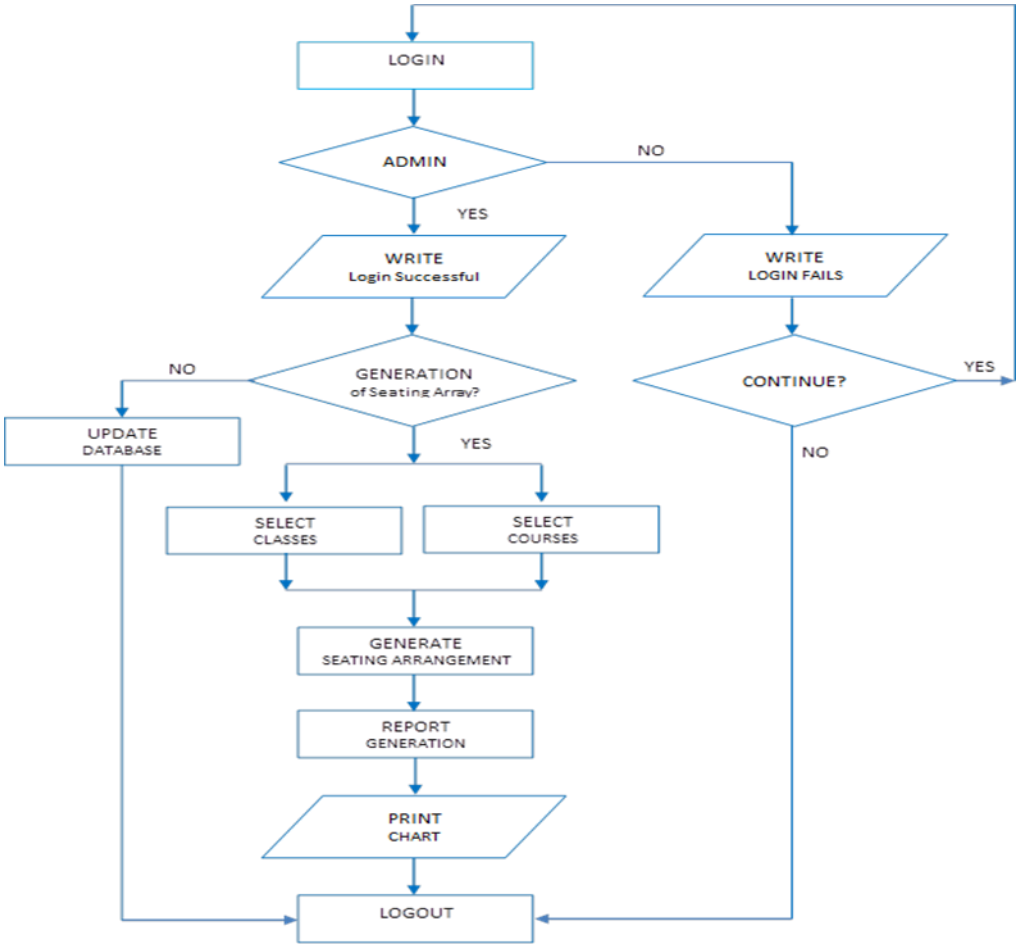


Figure 3: Data flow diagram for the seating arrangement system

Figure 4 depicts the data flow diagram that was used for the coding of the proposed App. The Admin is in charge of the proposed App. The App expects the Admin to first and foremost logs on to the system. If the login fails, the App will ask the Admin to log in again and again. In a situation where the login is successful, the App will ask the Admin whether he wants to generate examination seating arrangement or just to update the existing data on the database. If he is interested in updating the contents of the database, the proposed App is expected to let the Admin do that and thereafter logout of the App. If the Admin is interested in generating seating arrangements for a given examination at a given period of the time, the App is expected to let the Admin selects various examination courses that would be done at that period; and rooms that are available for the examination at that period. Based on this information supplied by the Admin, the App is expected to execute HAS to carry out its function. After the generation of the seating arrangement, the App is expected to present to the Admin the option of printing.

2.2 Creation of Database and Insertion of Data

In the App, the use and creation of a database is inevitable. A database which contains all the lists of students, courses registered by each student for a particular semester and numbers of classes as well as the capacity of each class were created. The database design of the system was created in the PhpMyAdmin module available in the XAMPP installation. A table containing administrative login information was also created in order to prevent unauthorized access to the system. A screenshot of a successful creation of the entire database needed for the web application using PhpMyAdmin is shown in Figure 5. The creation of these databases will enable the Admin to add new students, delete students and rectify any discrepancy that might exist in the system.

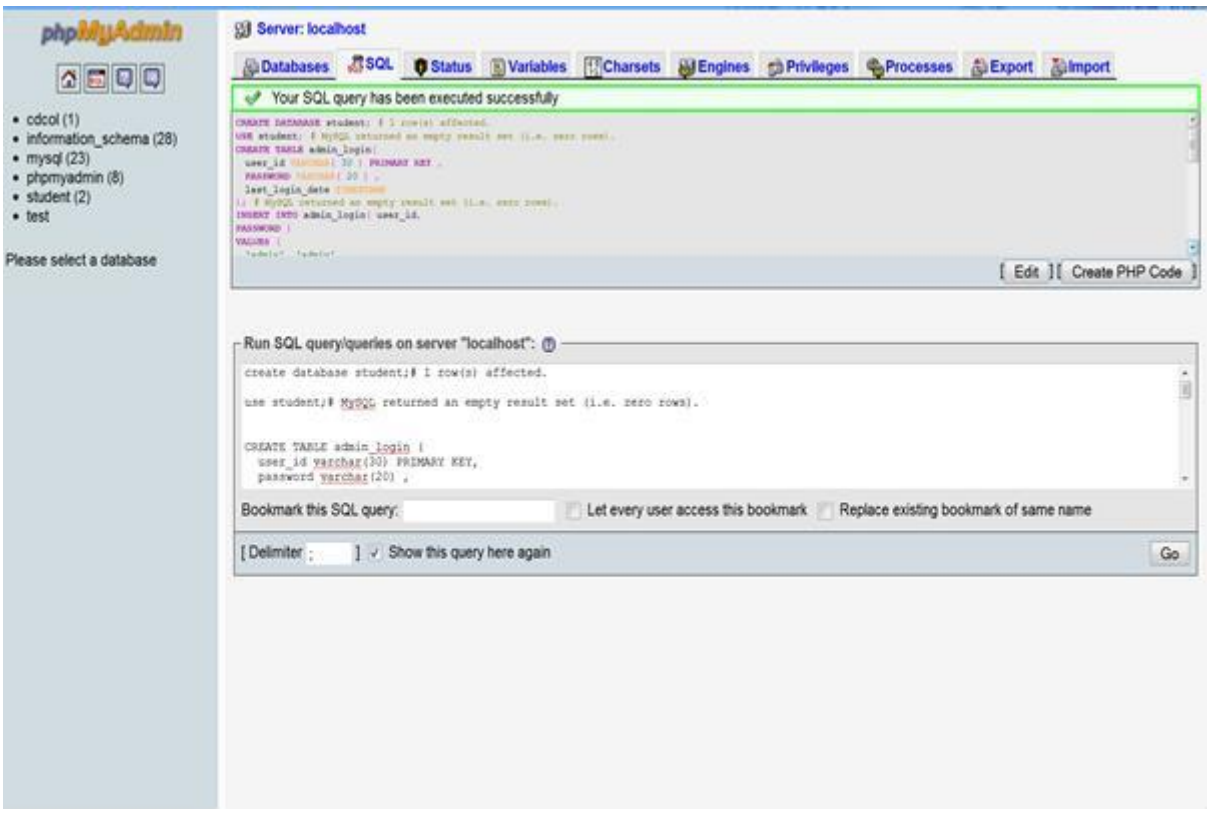


Figure 4. Creation of database in MySQL using phpMyAdmin

2.3 Project Modules

Our system is basically designed for students as they may face many problems in finding out the exam hall and their seat arrangement. Delay in finding the examination hall may lead to student on reaching on time at their examination venue as this may lead to student absent in the particular exam or it may create unnecessary stress for student which might make them to perform poor in exam.This system is developed to simplify the exam seat allocation process of student during exam. It also facilitates to access the particular student exam information.They are:

Login Module: This module is used by the administrator to log on to the App; using his or her unparalleled user ID and PIN. For security purposes, it is only the administrator that is empowered to access the module.

Database Module: This module is used by the administrator to update the student, course, class and departmental information. It is imperative because inaccuracy in class capacity, departmental size and student information may lead to misallocation of students.

Allocation Module: This module is responsible for the allocation of students; based on the parameters selected by the administrator. After the allocation of students is completed, this module passes the generated chart to the display module.

Display/Report Module: This module collects data from the allocation module and generates a report of the seating arrangement while displaying the seating chart

2.4 System Requirement and Specification

A. Software Requirement: - Operating System: - Windows 7/8/8.1/10
Language: - PHP script Language, HTML
Xamp-Win64
B. Hardware Requirement: - RAM: - 2 GB
Hard Disk Space: - 1GB

2.5 TECHNOLOGY STACK

• XAMPP is an abbreviation for cross- platform including Apache, MySQL, PHP and Perl.
• PHP is used for front end development to create web pages in our system.
• MySQL database system is used for back-end purposes in our proposed system.
• HTML is the standard markup language used for developing Web pages. HTML is used to create own Website. Each page contains a series of connections that help to navigate to other pages using hyperlinks. It defines meaning and structure of web content

3. RESULTS AND DISCUSSION

3.1 Flow Analysis

In launching the proposed App, the Admin is first presented with a login platform which can only be accessed with the correct credentials. If there are numerous administrators, unique credentials are generated for each of them. The login page

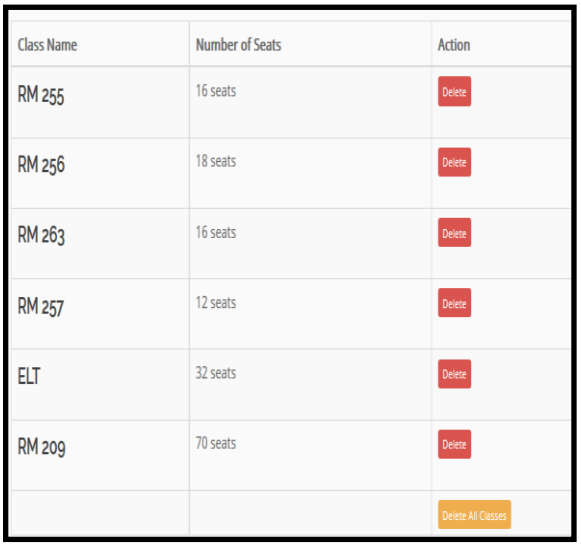
After successful login, the administrator is presented with three data input options and the generated options. The data input options include:

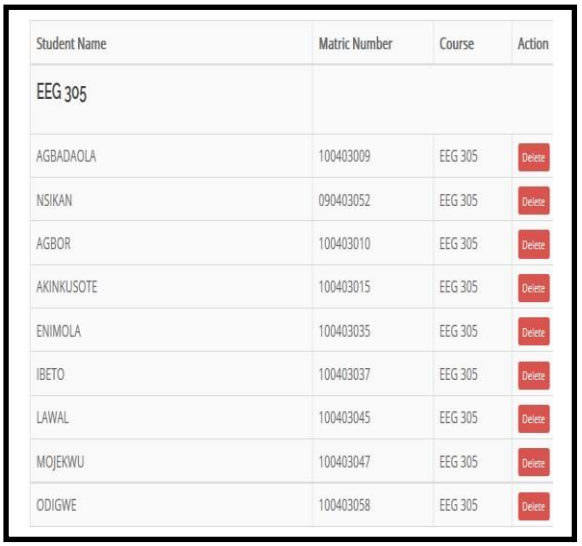
Add Student Details: This option allows the system administrator to add any number of students into the database based on the courses that each student is offering. This module is shown in Figure 7.

Add Registered Classes: This option enables the administrator to add halls/rooms that have been designated for the examinations to take place. During this process, the administrator has to enter the rows and columns in a particular class and the system generates the number of seats that are available.

Add Courses: This option allows the administrator to add individual courses that examinations are to be taken into the system. This module can take as many courses as are available.

The information received from all the data input options is stored in a MySQL database. The seating arrangement





application has a graphical interface that can be used to access the database. Here, student information, classes and courses can be viewed, modified or deleted when necessary. The graphical databases implemented in the application are shown in.

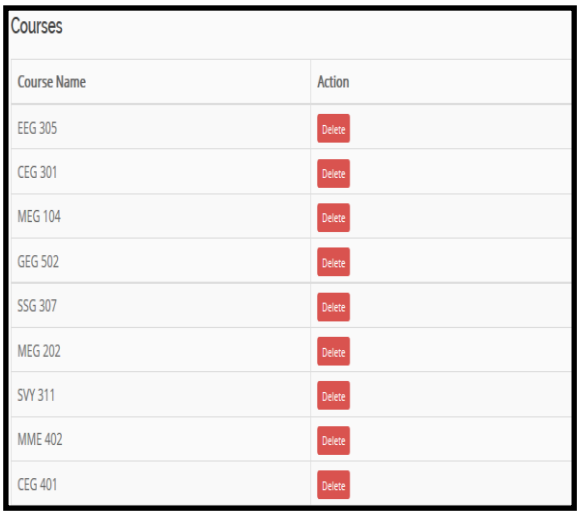


Figure 5. Course database

3.2 Discussion

It can be used in various colleges, institutes, school and university level also.
• All types of exams can be conducted under this system so that there is no any specific limit of students.
• In the future system, after conducting exam on university level that exam seat will be allocated dynamically so that only administrator must have to fill data.
• With the help of 3D graphics, it can show the class architecture more efficiently.
• While implementing a project on university level, system will add number of colleges at a time. So that different college administrator will be having an authority to conduct exam.

CONCLUSION

Exam seating arrangement system is developed successfully for the purpose of allocating exam seats to the student automatically and reduces the manual task for seat arrangement. A web-based interface for showing exam seat arrangement is developed. It provides seating arrangement-based student data stored in database, so that there are no two exams for student at same time In this work therefore, a web-based App that arranges students sitting for examinations in an examination hall such that no two students offering the same examination or course are in close proximity to each other is therefore developed and proposed.After adequate testing, the proposed examination seating arrangement App achieved all its specified functions which include: Implementation of administrative login modules, addition of class and course data through a GUI into the database, addition of student data into the database, automatic arrangement of student writing examinations such that students writing the same examinations are not positioned together. After the arrangement has been generated, the administrator is presented with the option of printing which makes the system all the more convenient.

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