

**ALGORITHMS AND PROBLEM SOLVING LAB**

**MINI PROJECT REPORT**

DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

**TITLE:**

Implementing a seat allotment system that allots institutes to the students based on AIEEE ranks.

**SUBMITTED TO- GROUP MEMBERS –**

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* PROBLEM DESCRIPTION –

The problem is to maintain a Seat Allotment System showcasing various colleges, the streams available in the colleges, allotment of seats in the college with respect to the branch of the student and hence the dynamic updating of the seats remaining. Lakhs of students appear in the AIEEE every year and get selected in various institutes. There are many other constraints as well for the allotment of an institute such as caste, gender, hometown etc. These are to be taken into account before the allotment of college to any student.

* PROBLEM STATEMENT:

Our System easily copes with all problems and takes into account all the involved constraints before allotting any student an institute based on his/her rank and various other factors. It is a self efficient system and is majorly useful for the students and also takes into account the preferred list of institutes by the applicant. It uses various data structures to

* Store details of the candidate
* Show the available colleges
* Show the streams available in every college
* Dynamic updating of the seats left
* And allot the seats
* LIST OF DATA STRUCTURES USED –

1. Binary Search Tree(BST)
2. Heap
3. Multi-dimensionally hashed table.

* GRAPHICS PACKAGE – Since the project is mainly concerned with the method of seat allotment and the continuous updating of the seats left, the use of graphics in the project is limited.
* SOLUTION – The solution that we propose tackles the seat allotment problem using a BST, a heap, and a multi dimensionally hashed table. It uses the above mentioned data structures as follows :
* The BST is used to check the details of the student.
* The heap and the hashed table are used to dynamically allocate the seats to the student applying and continuously update the status of the remaining seats.
* We also use File Handling for storing the credentials of the student and as well as the details of choices of all the candidates.
* WORKING –

1. The project starts off by taking the user name, password and rank input from the student.
2. The credentials provided are verified (for an existing user) else a new account is created.
3. The user is asked to fill in his/her desired preferences of college and the branch.
4. The preferences are taken from the user as a combination of the college code (provided) and his/her desired branch code (provided).
5. A total of 5 choices are taken as input from the user in a decreasing order of priority.
6. These priorities are stored in a heap.
7. The input of combination of college and branch codes from the user is decoded into a simpler format.
8. A multi-dimensionally hashed table is maintained that contains the seat status of various colleges and the branches in those colleges.
9. The decoded priorities are taken up one by one; in a decreasing order of priority.
10. The first most preference of the user is taken. (College code Branch code format)
11. The code checks the corresponding college and the branch.
12. If the college and branch corresponding to the first preference are available, it is allotted to the student and the seat status is updated.
13. Else, if the college and branch of the first priority are not available, we check the college and branch corresponding to the second preference of the student.
14. Similarly if the second preference is available, we allot that seat to the student and display the current status of seats in the college after updating the newly allotted seat.
15. Else, if not available, we check the third one, then fourth and then fifth.
16. If we exhaust all the preferences filled by the student and are not able to find a seat for him/her because of the already filled seat status, NO seat is allotted to the student.
17. The status of seats in all colleges for all streams is displayed in the end.

* TECHNOLOGY/PLATFORM USED:

The platform for implementation of our project is C++.

* REFERENCES:

[www.wikipedia.org](http://www.wikipedia.org)

[www.google.co.in](http://www.google.co.in)

[www.josaa.nic.in](http://www.josaa.nic.in)

[www.quora.com](http://www.quora.com)

www.stackoverflow.com