Data Structures Project

Select a project to demonstrate your learning in the course. Select a topic/problem and suggest its solution by selecting appropriate data structures and algorithm. The project ideas are listed below but you are not limited to these ideas only.

Note: Each group consists of a maximum of **three members**. For each group, only one submission is required on LMS. Project presentations are mandatory.

Project selection Due date: 18 Nov 2021

In this assignment, you have to explore the project ideas and select a project in which you are interested using the data structures you studied in the course. Create a word document that includes the following points for the approval of the project and then submit it on LMS within the due date for project selection.

- List the names of group members.
- Suggest a suitable title for the project
- Provide a brief description of the problem and its applications.
- Suggest a data structure design that you are going to use to solve the problem.
- If data is needed to demonstrate the working on the project, then write how you would collect the data.

Note: Each group has to discuss their selected project with the instructor and have to take **approval** before starting the working on the project. This will avoid the cancellation of the project at the end of the semester. Submit in LMS.

Project ideas

1. Quran Explorer
2. Search Engine (from E-newspaper, medical data, Emails, recipes, expert search, job)
3. Photo library Application (photos in IBA events)
4. Math tutorial
5. Data structures tutorial with Animation
6. Implement Text and Images Compression Algorithm (Run-length encoding, Huffman codes, etc.)
7. Searching Applications (use binary search tree for range searches)
8. Find similarities between documents (apply suffix tree,)
9. Information Extraction (from Business document, web, blogs, news) for competitive analysis
10. Book reviews analysis from online book store
11. Game (puzzle, MAZE, Hangman,)
12. Create MAZE automatically using depth-first search.
13. Text or code plagiarism detector
14. Decision tree (disease diagnosis, personality checker, application in Banks)
15. Spelling checker and acronym finder
16. Dictionary (phone directory, contact book, English to Urdu dictionary, etc.)
17. Analysis of Cricket matches and players (analysis using past data)
18. Simulations (Queue, stack,)
19. Event scheduler
20. Shortest pathfinding (Dijkstra's algorithm, Warshall's algorithm)

Project presentation **Due date: 7 Dec 2021**

The final submission of your project includes the following deliverables:

a. [4 Marks] Presentation slides consists of
   i. Project title: give a meaningful name to your project
   ii. Highlight the main points to demonstrate the importance of your project.
   iii. Discuss the reasons for the selection of your data structure design for the given project. It is also possible that your data structure design is a combination of different data structures.
   iv. Show the diagram of the data structure design in ppt slides that you have implemented to store the data. Additionally, includes diagrams, tables, and charts to explain the working of the project.
   v. If you are using a data file, show some sample data on ppt slides.
   vi. Include slides to explain the Big O Analysis of each method you implemented in the project. You can demonstrate it using a table, charts, and diagrams.
   vii. The last slide of the ppt must mention the list of references from where you studied and get help in your project.
b. [5 Marks] Project demonstration through code execution (java code only).
c. [1 Marks] GUI

Note the following instructions:

- **The order of presentations will follow the order of the student's name in the attendance sheet. If a group is not available on their turn, then they will be considered absent.**
- If any group member's name comes first in the attendance sheet, the whole group must appear for presentation. No changes are allowed.
- Each group can have at most three members.
- Each group member must appear at the time of the final project presentation to be graded.
- Each member will be graded individually.
- Only one final submission is required for each group on LMS after the project presentation.
- Make a ZIP folder and include all the deliverables as mentioned above then upload it in LMS.