IET, Ahmedabad University

Course Title: `Data Structures and Algorithms - Lab'

List of suggested projects

Instructions for Project teams

Students are required to work on the projects and each team should have two students. It is the responsibility of the students to form and manage their own teams. All team members must be involved in all aspects of the project. To collaborate effectively, team members should divide the project responsibilities so that they can work effectively in parallel. However, each member should be familiar with the work done by all other members. Proper time management is critical – if you don't start working on the assignments early you will not be able to complete the projects!

Students are free to select their own projects but each team must get approval for the project work to be undertaken.

Notes

- You can refer, understand and learn content at various sources referred by you to prepare your project report. Do not copy and use literature or content from source or write-up prepared by other group. You must use Open Systems to check for plagiarism, verify and cross-check content and reference before you submit final version of the report
- Select any other version of unix or Windows and to implement your work
- Programs can be written in c or Java or C++ languages

Suggested Outline of Project Report to be submitted

- Title of the project
- Team Members (Student ID and Name)
- Problem Statement / Brief description (not more than two A4 size pages)
  Submit your proposal containing above three fields by August 14, 2014 20:00
- List of Data Structures to be used with logical design

- Operations to be perform on each data structure:
    - ❖ Insertion
    - ❖ Deletion
    - ❖ Updation
    - ❖ List or Print all the values
    - ❖ Search for a specific elements for given input values
    - ❖ Requirements of processing on data structures
        - ▪ Keeping elements in a specific order (ascending or descending order)
        - ▪ Balancing or compaction
    - ❖ Save each data structure in a file and regenerate data structure from a file (Hint: use of serialization and object persistence)
- Algorithms / Pseudo code / Flow charts for each logical process
- List of programs
    - ❖ Filename of each program
    - ❖ Source code of each program (with proper comments and documentation)
    - ❖ Input data
    - ❖ Output generated
    - ❖ List of bugs or defects
- Test Results in the form of snapshots captured and included in one doc file
- References: books, research papers, articles, and web sites referred

Last date of submission: October 12, 2014

Suggested Topics

- Search of catalogues in a library: use of Binary Tree
- Operations performed at any automatic teller machine (ATM)
- Create Binary tree, implement all tree traversal algorithms, store binary tree in an external file and reconstruct binary tree using tree traversal algorithms
- Online Banking System: to support operations for withdrawal, deposit, transfer of funds, statement of transactions
- Memory Management: Static Memory Management or Virtual Memory Management
- Blood Bank Management: information about blood groups, blood donors, requests for bottles of blood, issue and receipt of blood bottles

- Project Management System: Information about employees, various projects, Activities part of each project, employees assigned to various activities etc.
- Simple text editor like notepad
- Eight queens problem
- Parse expressions using a binary tree
- Design and implement Huffman trees
- Travelling Salesman Problem
- Transportation Problem: delivery of goods from manufacturing site to various sales counters all over the state
- Printer queue: to support jobs with multiple priority queues
- Queue simulation is a modeling activity used to generate statistics about the performance of queues. Build a model of a multiple-server queue for a sales office having more two windows to service customers.
- Class diagrams, to represent relationship among classes (including inheritance, association etc.)
- Use any of Tree structures like AVL Tree or TRIE, 2-3-4 Trees, M-Way Tee and develop an interesting application.
- Use Graph and develop an interesting application.

Note: You can make and state assumptions clearly about various activities related to your project work.