MES's Pillai College of Engineering, New Panvel

A REPORT ON
PROJECT BASED LEARNING (PBL)

Academic Year 2016-2017 (Semester IV)
Second Year Undergraduate Students of

Computer Engineering Department

Objective—To enable the students to apply concepts of the present semester subjects (including those of previous semesters) in the form of a design project based on certain application. It is hoped that it shall eventually lead to a better learning experience as opposed to textbook learning. Separate topics are assigned to all students in groups (maximum 4-6 students per group) of the same year to enable healthy competition among the different teams. The students work in groups and assign and distribute various aspects of work so as to realize the project based on a timeline of about 2 to 3 months. Queries and doubts are clarified by interactions with the PBL coordinators and subject experts. Student groups submit the PBL report during their demonstrations on a specified date in front of the faculty members.

Judges for the PBL Demonstrations

All Computer and IT Engineering Faculty of the concerned class.

PBL Coordinators

Division A	Prof. Deepti L
Division B	Prof. Sujit T

PBL Topic list:

#	Topic	Description
1	Finite Automata Design	Finite automata is a state machine that takes a string of symbols as input and changes its state accordingly. Finite automata is a recognizer for regular expressions. When a regular expression string is fed into finite automata, it changes its state for each literal. If the input string is successfully processed and the automata reaches its final state, it is accepted, i.e., the string just fed was said to be a valid token of the language in hand. The goal of this project is to develop a finite automata using algorithms, simulate the working using Computer Graphics to show different states and transition between states graphically and finally analyse the time and space complexities.
2	Pattern matching using FA	The goal of this project is to develop Finite Automata (FA) based pattern searching algorithm. In FA based algorithm, we preprocess the pattern and build a 2D array that represents a Finite Automata. Construction of the FA is the main tricky part of this algorithm. Once the FA is built, the searching is simple. In search, we simply need to start from the first state of the automata and the first character of the text. At every step, we consider next character of text, look for the next state in the built FA and move to a new state. If we reach the final state, then the pattern is found in the text. The time complexity of the search process is O(n). The functionality will be simulated using Computer Graphics.
3	Parse tree design	Parse tree is a hierarchical structure which represents the derivation of the grammar to yield input strings. Root node of parse tree has the start symbol of the given grammar from where the derivation proceeds. Leaves of parse tree represent terminals. Each interior node represents productions of grammar. The goal of this project is to develop a parse tree for a given Grammar and a string, simulate it using computer graphics and analyse the complexity of the algorithm
4	Path finding between two locations	Implement an algorithm to find multiple paths between two locations.
5	Simulation for Booth's Algorithm	Booth's Algorithm is used for Multiplication of two numbers. The main purpose is to produce a multiplier with simulation and to maximize the speed in which the multiplier performs the calculation. The simulation can developed using Computer Graphics. The simulation algorithm can be analysed by using algorithm analysis measures.
6	Simulation for Restoring Division	Restoring Division Algorithm is used for division of two unsigned numbers. The main purpose is to develop a simulator which performs division of two unsigned binary numbers using restoring concept. The simulation can developed using Computer Graphics. The

		simulation algorithm can be analysed by using algorithm analysis measures.
7	Simulation for Non-Restoring Division	Non-Restoring Division Algorithm is used for division of two unsigned numbers. The main purpose is to develop a simulator which performs division of two unsigned binary numbers using non restoring concept. The simulation can developed using Computer Graphics. The simulation algorithm can be analysed by using algorithm analysis measures.
8	Offline City Planning	An algorithm can be used to search for optimal future land-use and transportation plans for a high-growth city. City planning is the art and science of ordering the use of land and buildings and communication routes. A polygonal area will be given to students to analyse using algorithm and plot various attributes of city planning such as land uses, the main movement systems and the location of critical facilities and buildings using computer graphics. The idea is to deliver an offline structural plan for a city planning process.
9	DB connectivity for java(telephone directory)	Java Database Connectivity (JDBC) is an application program interface (API) specification for connecting programs written in Java to the data in popular databases. The application program interface lets you encode access request statements in Structured Query Language (SQL) that are then passed to the program that manages the database. It returns the results through a similar interface. The goal of this project is to be able to access database through Java application.
10	DB connectivity for Java (Application to display Time tables of college)	
11	Employee Leave management System	Maintaining a Leave record for all types of employee by following the institutional rule is main objective of this project. Employee can apply for leave through his/her mail_id, Leave records can be stored in any database software and user interface can be by using Computer Graphics. This algorithm can be analysed by using algorithm analysis measures like time and space complexity, also data structures used in algorithm.Various graphs can be plot to analyse the leaves of employee.
12	Attendance tracking system	The goal of this project is to keep track of student's attendance, internal assessment grades; and sending out alerts based on the appropriate thresholds. Provisions such as ability to view only your own record as a student, access and edit all records as a teacher should be enabled. DB Connectivity should made from the code and the algorithms for various functionalities must be analysed.

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