

Vasavi College of Engineering

Ibrabimbagh, Hyderabad -31

Department of Computer Science & Engineering

A Report on Two Day Student Training Programme on “**Data Structures**”

Conducted during Jan 30th –Feb 01st , 2014

(Conducted Under TEQIP-II)

Department of Computer Science and Engineering have organized a Two Day Student Training Programme on “**Data Structures**” during Jan 30th – 1st Feb, 2014 for students of B.E. 2/4 CSE at VCE College Campus.

Ms. Supriya Pathuri ,Coign Edu & IT Services Ltd was invited to deliver the sessions for student training program(STP).

Ms. Supriya Pathuri has 4 years of IT experience and presently working as Programmer Analyst.

The objective of the SDP was to equip the students with skills in data structures and improve their employability skills.

The speaker started off session with an introduction to the **Pointes, Functions**. The sessions covered concepts of data structures such as Stacks, Queues, Linked Lists, and Trees & Graphs.

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The basic concepts of data **STACK** were discussed with the real time illustrations such as stack of plates or books where you can only take the top item off the stack in order to remove things from it.

The very useful applications of stack where discussed such as Evaluation of an Infix Expression.

A **LINKED LIST** is simplest and can be used to implement stacks, queues, associative arrays, and S-expressions etc...

Linked lists allow insertion and removal of nodes at any point in the list. They have a data field and pointer field, which points to the next node in line.

A **DOUBLY LINKED LIST**, each node contains, besides the next-node link, a second link field pointing to the previous node in the sequence.

CIRCULAR LIST: In the last node of a list, the link field often contains a null reference.

A less common convention is to make it point to the first node of the list; in that case the list is said to be circular or circularly linked; otherwise it is said to be open or linear.

QUEUES are dynamic collections which have some concept of order.

This can be either based on order of entry into the queue - giving us First-In-First-Out (FIFO) or Last-In-First-Out (LIFO) queues.

A **TREE** is a data structure that can be defined recursively (locally) as a collection of nodes. The simplest form of tree is a binary tree.

A binary tree consists of a node (called the root node) and left and right sub-trees..

A **GRAPH** is a data structure consists of a finite (and possibly mutable) set of ordered pairs, called edges or arcs, of certain entities called nodes or vertices.

A **GRAPH** data structure may also associate to each edge some edge value, such as a symbolic label or a numeric attribute (cost, capacity, length, etc.).

Students were given a problem to solve based on the tree concepts as follows

The Minimum Spanning Tree Problem:

Suppose we have a group of islands that we wish to link with bridges so that it is possible to travel from one island to any other in the group.



Further suppose that our government wishes to spend the absolute minimum amount on this project (because other factors like the cost of using, maintaining, etc, these bridges will probably be the responsibility of some future government).

The engineers are able to produce a cost for a bridge linking each possible pair of islands. The set of bridges which will enable one to travel from any island to any other at minimum capital cost to the government is the minimum spanning tree.