Data Structures

BCT , 2nd Year 2nd Part

Lecture 00: Course Overview

What is this class about?

- **Data Structures and Algorithms**
- Data Structures
  - *methods of managing large amounts of data*
- Algorithms
  - *procedures to solve computational problems*

DATA STRUCTURES + ALGORITHMS = PROGRAMS

Objectives of the Course

- To teach the basics of *organizing* data in an *effective* and *efficient* way
- To provide an insight into the *design* and *implementation* of the *data structures* required to build effective and efficient programs

Course Contents

- Introduction
- Arrays
- Stack and Queue
- Linked Lists
- Recursion

- Trees
- Sorting
- Searching
- Growth Functions
- Graphs

Prerequisites

- Knowledge of structured programming
  - preferable C
- Students must be familiar with control structures, functions, arrays, pointers and structures

Books

- Textbook
  - Y. Langsam, M.J. Augenstein, and A.M. Tanenbaum, ***Data Structures Using C and C++***. Second Edition, Prentice Hall
- References
  - N. Upadhyay, S. K. Kataria and Sons, ***The Design and Analysis of Algorithm.***
  - E. Horowitz, S. Sahni, and D. Mehta, ***Fundamentals of Data Structures in C++***. W.H. Freeman and Company, 1995
  - A.V. Aho, J.E. Hopcroft, and J.D. Ullman, ***Data Structures and Algorithms***. Addison-Wesley, 1983

Books

- References
  - J.P. Tremblay, and P.G. Sorenson, ***An Introduction to Data Structures with Application***.
  - R.L. Kruse, B.P. Leung, and C.L. Tondo, ***Data Structures and Program Design in C***. Prentice Hall, 1991
  - M.A. Weiss, ***Data Structures and Algorithm Analysis in C***. Second Edition, Benjamin-Cummings, 1997

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