CS214-Data Structure

Lecturer: Dr. Salwa Osama

That course is inspired from the following Drs:

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Dr. Marwa Abdelfattah

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Good Software

Essential attributes of good software

Product characteristic	Description
Maintainability	Software should be written in such a way so that it can evolve to meet the changing needs of customers. This is a critical attribute because software change is an inevitable requirement of a changing business environment.
Dependability and security	Software dependability includes a range of characteristics including reliability, security and safety. Dependable software should not cause physical or economic damage in the event of system failure. Malicious users should not be able to access or damage the system.
Efficiency	Software should not make wasteful use of system resources such as memory and processor cycles. Efficiency therefore includes responsiveness, processing time, memory utilisation, etc.
Acceptability	Software must be acceptable to the type of users for which it is designed. This means that it must be understandable, usable and compatible with other systems

Skills of Software engineer

Skills You need to learn as a Software Engineer

ABILITY TO WRITE, READ AND FOLLOW DIRECTIONS

ABILITY TO UNDERSTAND AND FOLLOW DESIGN PATTERNS

ABILITY TO WRITE EFFICIENT ALGORITHMS

ABILITY TO WORK WITH OR MANAGE A TEAM

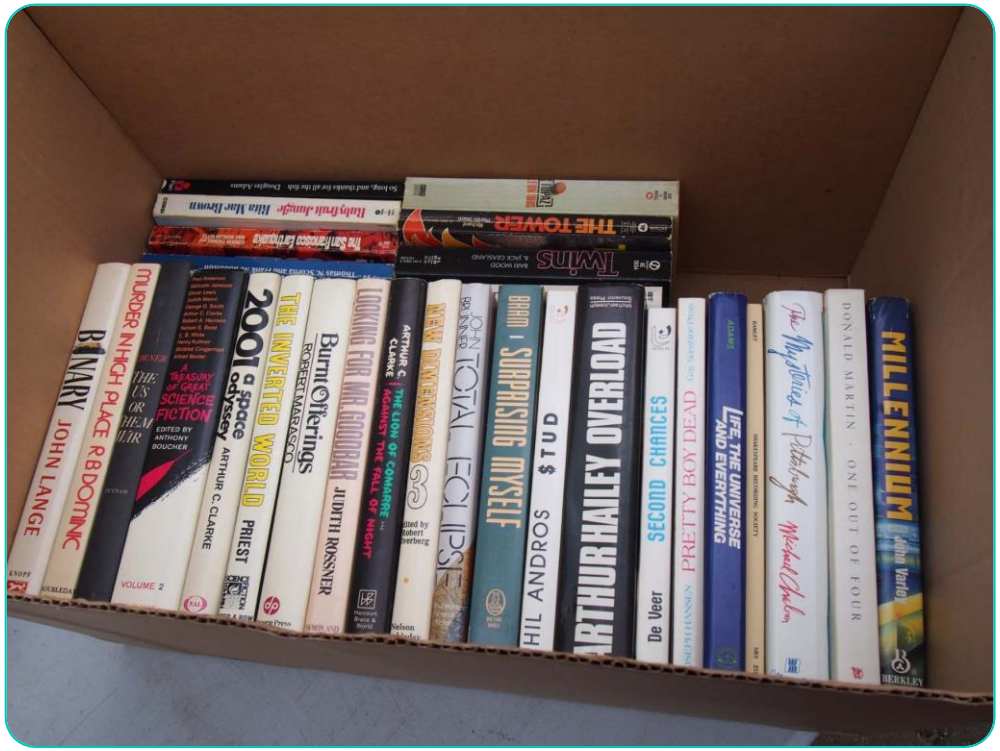
Efficiency of an Algorithm

- An algorithm which **takes fewer resources** and computes results in a **minimum time** for a problem then that algorithm is known as efficient.

Data UnStructure

Data Structure

Data Structure

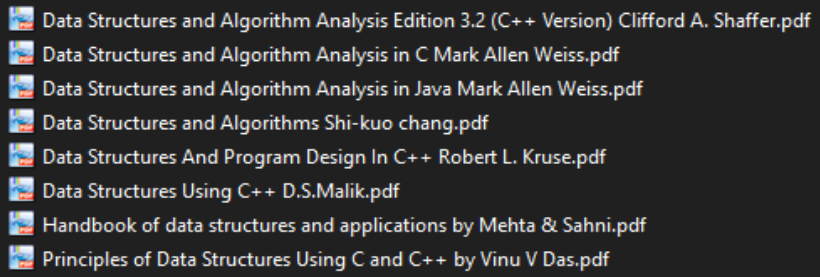


Data Structure

Data Structure

Textbook

- Very Important Texts in C
  - Kernighan and Ritchie (1988) is a very good text, but not for beginners.
- Very Important Texts in Programming (Algorithms and Data Structures)
  - Knuth (1997) is a reference by Knuth, the father of computer programming (the first 3 volumes are dedicated to Algorithms, along with their analyses, and Data structures). Every student in computer science has to read from this book. Sedgewick (1998) is a reference by Sedgewick, a student of Knuth. It is a very good text, full of insight, in algorithms and data structures in C. The author has the book in different programming languages, e.g., C++, and Java. Cormen (2001) is a key book in algorithms in pseudo-code. Press (1992) is a great source in numerical recipes in C, with ready-to-use code.



Syllabus

BFS & DFS
Linear Search& Binary Search

Week1	**Introduction**	
Week2	Stack	Sheet1: Stack
Week3	Queue	Sheet2: Queue Sheet3: Stack &Queue
Week4	Linked list	Sheet4: Linked list
Week5	Linked stack and queue	Sheet #5 Linked Stack & Queue Quiz1
Week6	Linked list use cases	Sheet #6 Linked Lists Use Cases
Week7	Trees	Sheet #7 Trees
Week8	Midterm	
Week9	Binary Search Tree	Sheet #8 Binary Search Trees
Week10	AVL Tree	Sheet #9 AVL Trees Quiz2
Week11	Hashing	Sheet #10 Hashing
Week12	Revision	

Grades Distribution

- Grades Distribution:
  - Final Written Exam **50%**
  - Midterm Written Exam **20%**
  - Sheets **10%**
  - Quizzes **10%**
  - Practical **10%**

Course Materials & Announcements

- Announcements, and any supplemental notes will be made available “posted” online on the MS Teams Group

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Any
Questions