COURSE: SWE-127 | 128

DATA STRUCTURE

SUST SOFTWARE ENGINEERING

LIST OF GIVEN ASSIGNMENT AND COVERED TOPICS

SESSION: 2019-2020

YEAR-SEMESTER: 1-2

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Data Structure-Topics

Note: We have to Cover All the Topics That I have Mentioned below for Upcoming Term Test

Term Test Syllabus:

- Chapter 1
- Chapter 2
- Chapter 3
- Chapter 4
- Chapter 6

CHAPTER 1:

- What is Data Structure? What are the Applications of Data Structure?
- What is the Difference between Array and Linked List? Which one is better in which situation?

Definition:

- Stack
- Queue
- Graph
- Complexity
- Time Space Trade-off
- Algorithm

CHAPTER 2:

Algorithm 2.1 (Largest Element in an Array)

- Coding

Big O Notation

- Rate of Growth
- Using the idea of Rate of Growth, explain which Algorithm is better?

Linear Search

Theory:

- Complexity Derivation

Coding:

- Finding the Largest and Smallest element of a Data Set

CHAPTER 3:

String Processing

Coding

- Substring
- Indexing
- Length
- Insert
- Replace
- Delete
- Concatenate [Strcat (str1, str2)]

CHAPTER 4:

Bubble Sort

Theory

- Algorithm Explanation
- Implementation of Bubble sort with Showing every comparisons and swaps

Coding

- Sorting a Data Set using Bubble Sort
- Counting the Total number of comparisons
- Counting the Total number of Swaps

Binary Search

Theory

- Algorithm Explanation
- Showing Each and Every Step (BEG, END, MID, TOP)
- Counting the Total Number of Steps

Coding

- Searching for an element using Binary Search
- Counting the Total number of Steps
- Printing Each and Every Step (BEG, END, MID, TOP)

2D Array

Must be Learnt

CHAPTER 6:

Stack

Theory

- Algorithm Explanation

Coding

Implementation of Stack using Array

- Pop () function
- Push () function

Arithmetic Expression

Conversion

Infix to Postfix

- Using Stack
- Without Stack

Evaluation

Evaluate a Postfix Expression

Theory

- Algorithm Explanation
- Showing Each and Every Steps

Coding

- Implement a Postfix Expression

Quicksort

Theory

- Algorithm Explanation

Coding

- Ma’am will discuss later about Implementation

Recursion

Theory

- Algorithm Explanation

Coding

- Factorial Calculation
- Fibonacci Calculation

Queue

Theory

- Algorithm Explanation

Coding

- Ma’am will discuss later about Implementation

Data Structure: Assignment Part

Linear Search

- Find the Smallest value in a Data Set
- Find the Largest value in a Data Set

String Processing

Coding

- Substring
- Indexing
- Length
- Insert
- Replace
- Delete
- Concatenate [Strcat (str1, str2)]

Array Manipulation

- Insert a new element in a sorted Array so that Array remains sorted
- Delete an element in a sorted Array so that Array remains sorted

Bubble Sort

- Sort an Array and Count Each and Every Comparisons and Swaps

Binary Search

- Search an Element from a sorted Array and Print All the steps of search and Total number of Steps

Stack Implementation

- Pop () Function
- Push () Function

Evaluate a Postfix Expression

- Input should be taken from user

Convert an Infix Expression to Postfix Expression

- Input should be taken from user

Recursion

- Factorial Calculation
- Fibonacci Calculation