SWE2001 – Data Structures and Algorithms

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CAM evaluation

1. Assignment – 1 **(10 Marks)**
2. Assignment – 2 **(10 Marks)**
3. Class participation (answering quiz during class hours) - **10 marks**

Data Structures - Introduction

- What is the problem

  if the books are not arranged in an order in the library ?

  if the files/folders are not arranged in your computer?

  If the items are not arranged in the box/suitcase ?

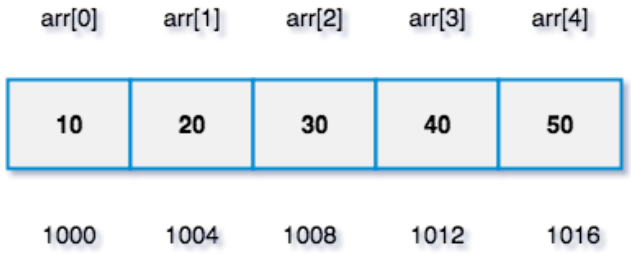
Search time

Utilization of space

Data structures

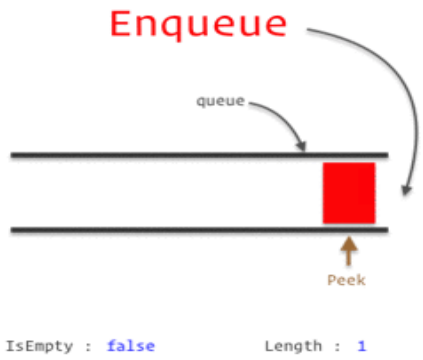
Data Structure :

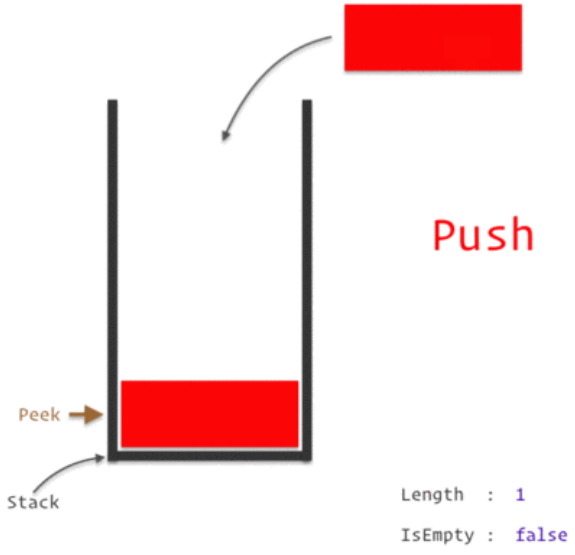
Data Structure can be defined as the group of data elements which provides an efficient way of storing and organising data in the computer so that it can be used efficiently. Some examples of Data Structures are arrays, Linked List, Stack, Queue, etc.



Array

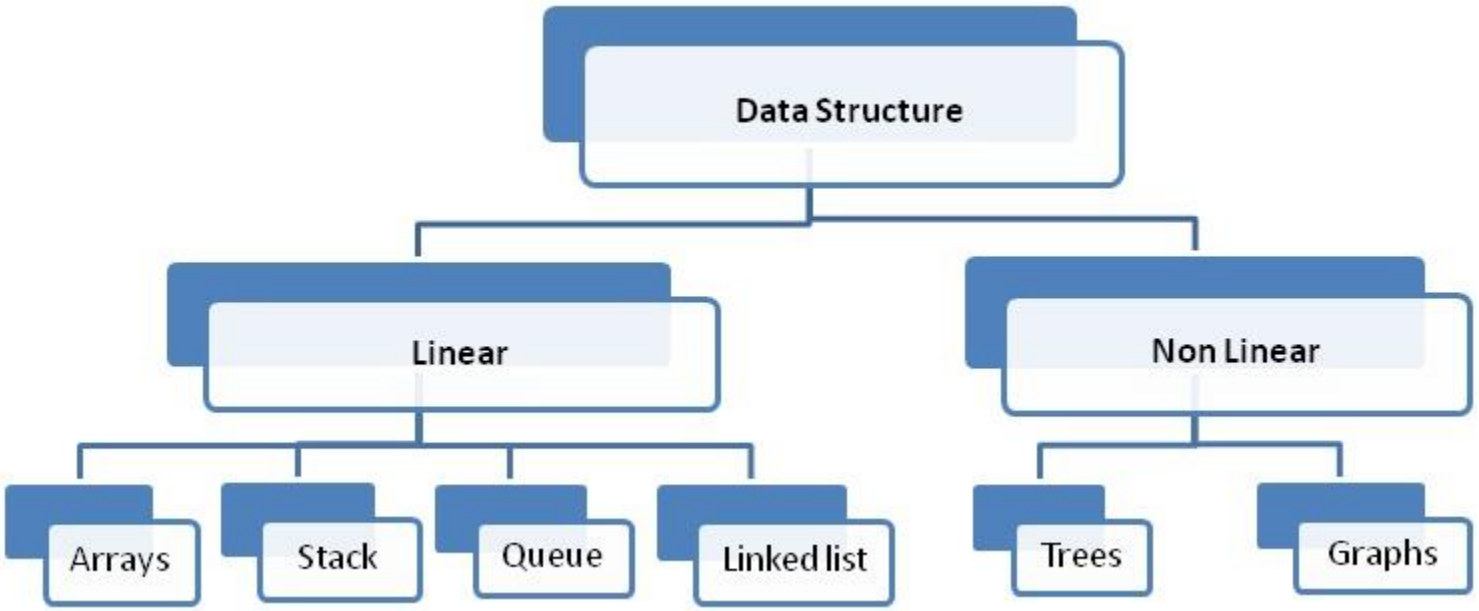
Queue





Stack

Two broad categories of Data structures
Based on the memory allocations/arrangement



Data items can be traversed in a single run.

Implementation is easy.

Memory utilization Ineffective
(since it was declared previously)

Data cannot be traversed in a single run.

Implementation is difficult.

Memory utilization Effective

Algorithm

Algorithm : It is step by step procedure to solve a particular problem. It should be written before writing the code in C/C++ etc.

Algorithm to add two numbers:

read a, b
compute c= a+b
print c

Algorithm to count sum of n natural numbers

read n
Sum = 0
for i = 1 to n
  sum = sum + i
print sum

Solution for the following

$(a + b) * (a - b) = a^2 - b^2$ `= a*a - b*b`


Thank
you!