



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF INFORMATION TECHNOLOGY

DATASTRUCTURES

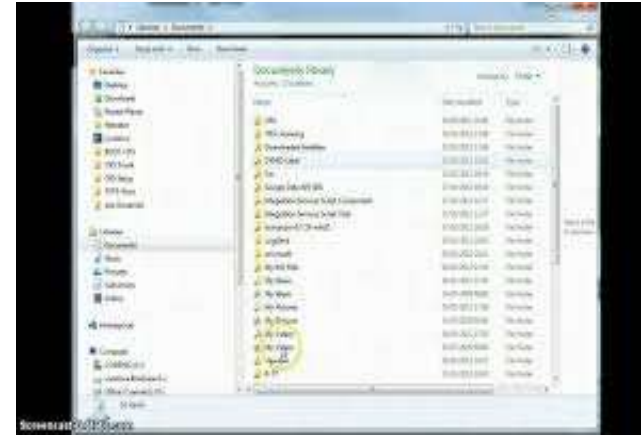
II YEAR III SEM

UNIT 1 – LINEAR STRUCTURES

TOPIC 1 – Introduction



Introduction- Need of Structure





Examples



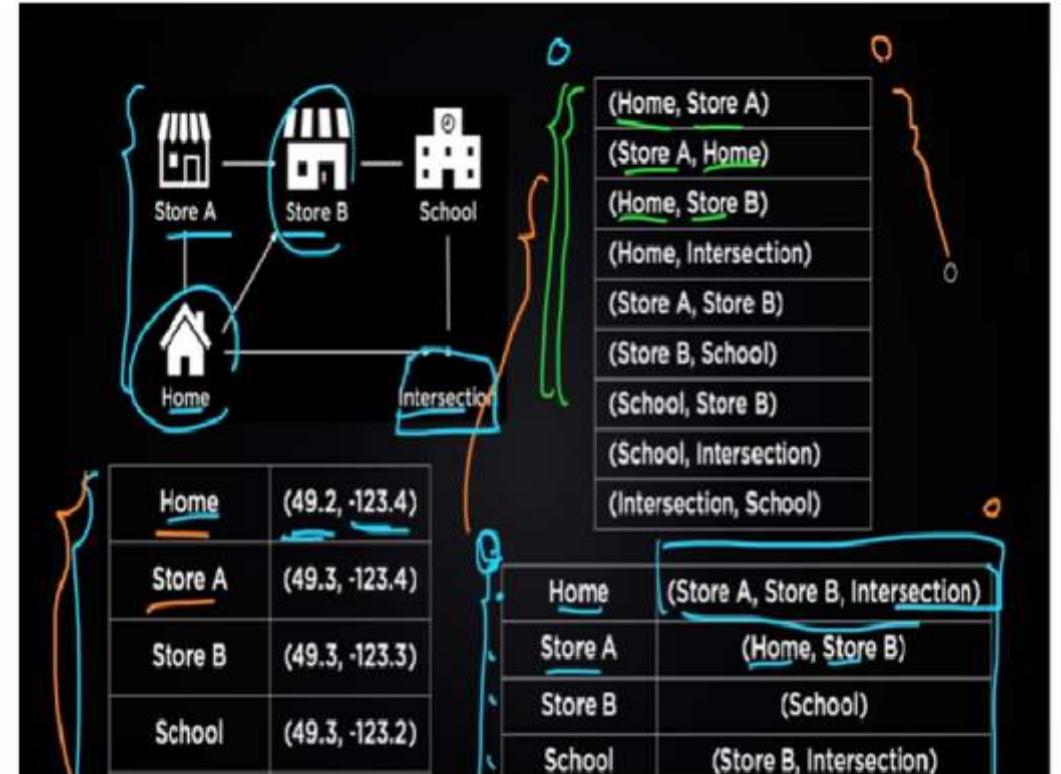
English Dictionary



City map

ABC Hardware
Cash Book - 03/01/2013 to 03/31/2013

| S. no. | Date | Particulars | Debit | Credit |
|--------|------------|-------------------|--------|--------|
| 1 | 03/01/2013 | Opening balance | | 50000 |
| 2 | 03/02/2013 | Transport bill | 2000 | |
| 3 | 03/07/2013 | Goods sales | | 1500 |
| 4 | 03/08/2013 | Bank Loan | | 5000 |
| 5 | 03/15/2013 | Goods sales | | 1000 |
| 6 | 03/17/2013 | Electricity bill | 1200 | |
| 7 | 03/21/2013 | Good sales | | 1200 |
| 8 | 03/25/2013 | Hardware purchase | 500 | |
| 9 | 03/29/2013 | Employee salary | 20000 | |
| 10 | 03/31/2013 | Closing Balance | | 35000 |
| | | Total | 58,700 | 58,700 |





Data Structure

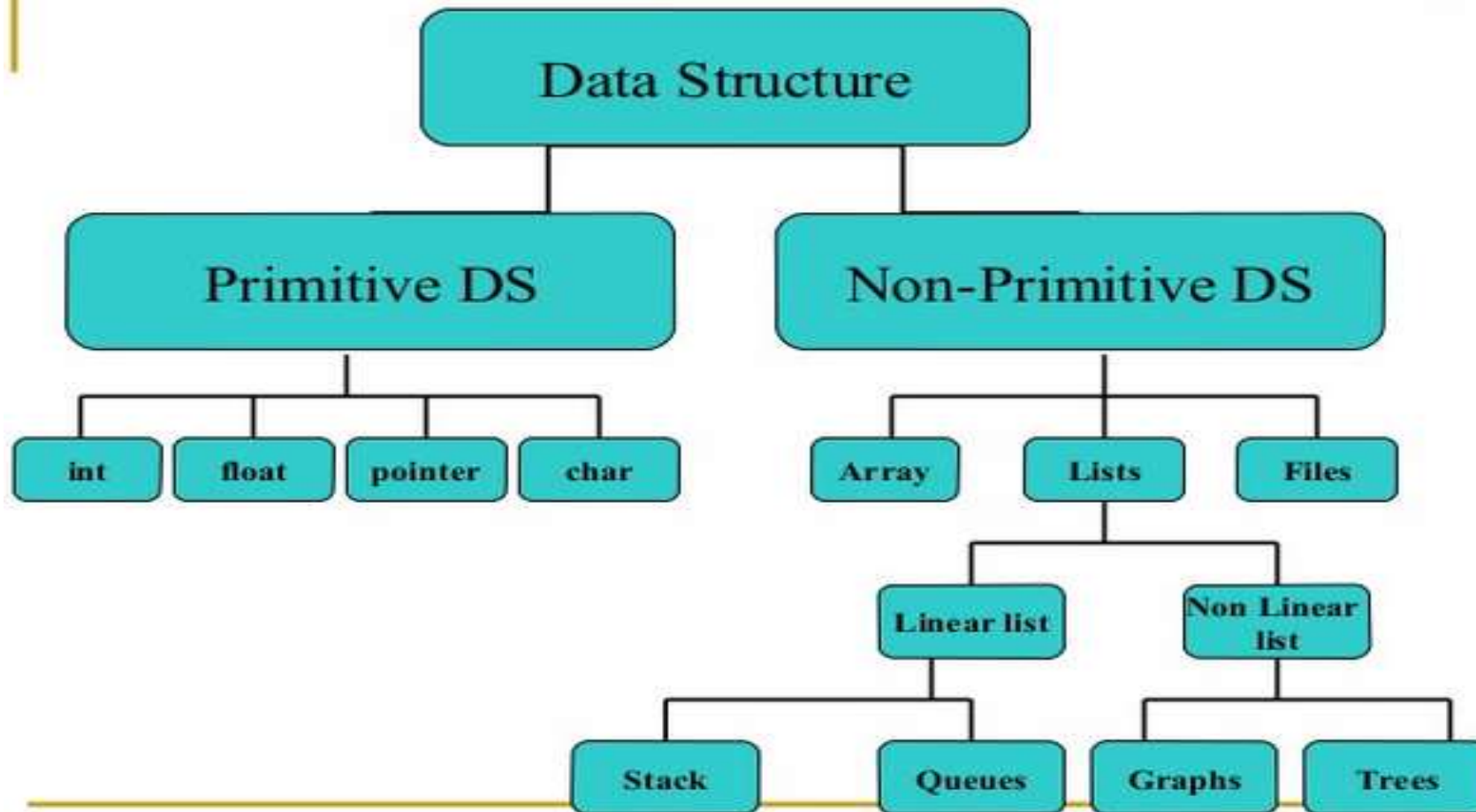
➤ **The logical or mathematical model of particular organization of data**

- Specifies the following four things
 1. Organization of data
 2. Accessing Methods
 3. Degree of Associativity
 4. Processing alternatives for information

```
11001
10001 11100110
0010 110001 11000110
00101001 01011010 1100
010101 1100000100 100
00011111 101001110
00101 11010 10
10010 101
00100
01001
00110
0000110
```



Types of Data Structure





Assessment -1

1.Which of the following data structure is non-linear type?

a.Strings

b.Lists

c.Stacks.

D.None of the above

2._____ defines a set of primitive elements which do not involves any other element as its sub-part.



Operations on Data Structures

- **Traversal** - Processing each element in the list
- **Search** - Finding the location of the element with a given value with the given key
- **Insertion** - Adding new element to the list
- **Deletion** - Removing an elements from the list
- **Sorting** - Arranging the elements in some type of order
- **Merging** - Combining two list into a single list

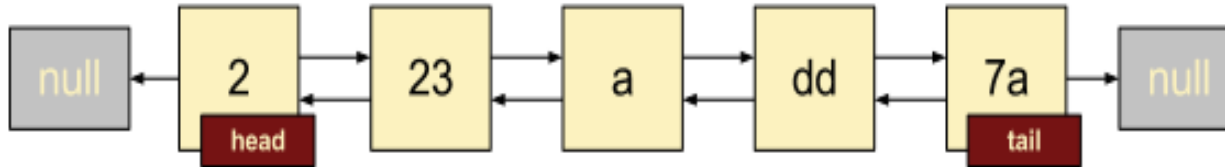


Implementation of Data Structure

Two ways of Implementation

- Array
- Linked List

Linked List



Array





Difference Between Array & Linked list

ARRAYS

1. **Good Data structure for Searching algorithms.**
2. **Disadvantage : Insertion and Deletion of Elements require Data movements(Time Consuming)**

LINKED LIST

1. **It allows quick insertion and deletion of elements.**
2. **Searching is difficult.**

A Sequential traversal from the beginning of the list is required to search for an element until it is found or up to the end of the list



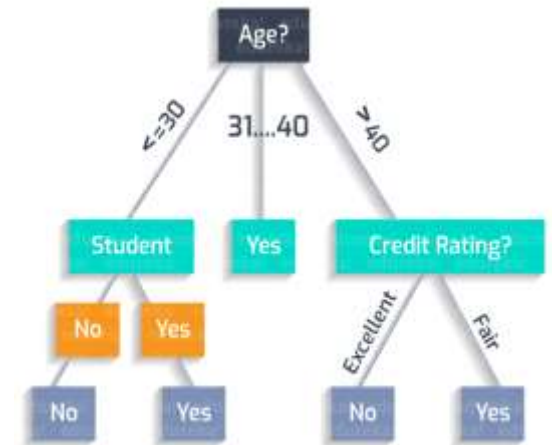
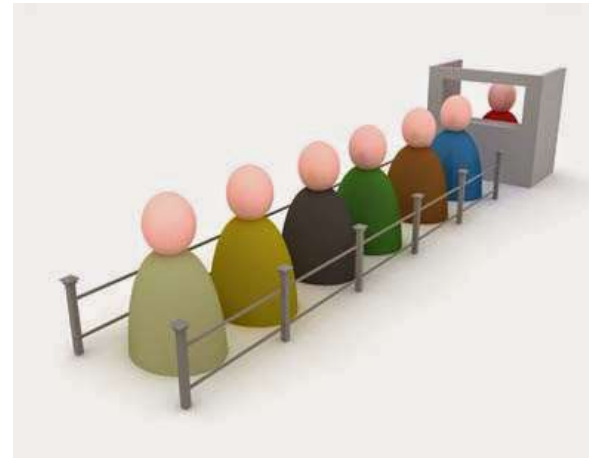
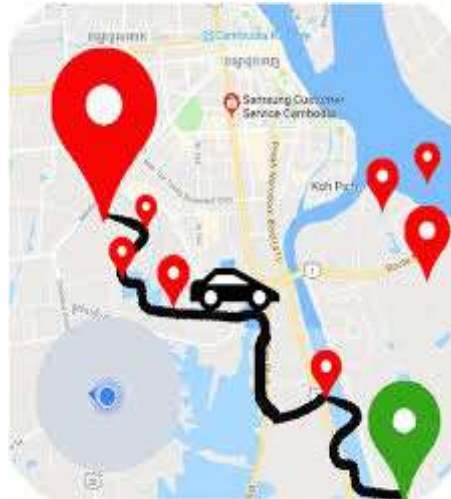
Benefits

- Space for each item it stores is more
- Time to perform basic operation is less
- Programming effort and complexity is reduced



Assessment 2

Identify the various name of the Data Structure





References

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd Edition, 2002.
2. A. V. Aho, J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 2nd Edition, 2007
3. Ashok Kamthane, " Data Structures Using C ", Pearson Education, 2nd Edition, 2012.
4. Sahni Horowitz, "Fundamentals of Data Structures in C"Universities Press; Second edition 2008



Thank You