WIDS PROJECT REPORT

NAME:

SOMISETTY

VENKATA

SAI

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YEAR OF STUDY:1st YEAR

PROGRAM:B.TECH

INSTITUTION:IIT BOMBAY

BRANCH:C.S.E

WEEK

1:

INTRO TO TREES(AND ITS TYPES)

Description:

This topic is mostly beginner oriented. It covers many basic definitions such as child,parent,height,depth…etc. Also in addition to slides,I have also studied this CP Hanbook.pdf(11th chap ,Basics of Graphs) Honestly it was very interesting.

Experience:

This week was pretty easy and fun.
In this I learnt basic trees.
Binary Search which is very useful algo.
And this week only I learnt all the basic terminology of trees needed in the upcoming weeks.

learnt:

Subtopics

Leaf

Node

Leftchild ,Rightchild

Depth,Label,Height

Ancestor,Parent

Binary tree

WEEK

2:

TREE WALKS

Description:

Tree walks,as the name suggests this week is covering the techniques of traversing trees.
Some well known techniques are Pre order walk,Post order walk and Inline order walk.
All the stuff in the slides can be used to solve Good tree traversing problems.

Experience:

This is the week in which I solved many problems
And felt that I actually learnt well.
Also in this week I got the chance to try out some tree problems

Subtopics

learnt , problems solved:

Tree walks
  Pre-order walk,Post-order walk,Inorder walk
  BST definition ans Algos:search
                insert
                delete
                maxima
                minima
                predecessor
                successor

  Heap:
    Priority Queue
    Partial Sorting
    Maxima
    Height of heap
    Sorting
    Insert
    Fix heap
    Delete max
    Heap sort
  14 Leetcode problems

3:

RED BLACK TREE AND AVL TREES

WEEK

Description:

This week is covering two major things in trees,i.e RBL and AVL trees. The concepts used in this week can be used in some specific tough problems.

Experience:

In this week ,I faced many challenges.
Because logically it was very complicated. Especially in the left shift,right shift and those parts where you change the positions of parent child or grandparent (like
interchanging them) then it becomes very confusing.

learnt ,problems solved:

Subtopics

RBT:
- Insert
- Black height
- Maxima
- Minima
- Delete

AVL:
- Height
- Insert
- Delete
- Rebalancing

Written 4 functions in rb.cpp in rb folder in this repo

4:

TRIES AND SUFFIX TRIES

Description:

In this you will learn about how to store postions of words in an organized manner. Previously we have seen things when keys were unordered or ordered which correspond to Hash tables and

WEEK

RBL,here we will see what happens if strings are keys

Experience:

This week was completely theory based. This topic,didn’t really understand why we are storing strings that way in the form of
tree,but I found it
interesting.
Also the application it has in routing table ,using IP addresses are the keys,

It seemed to be amuse me.

Subtopics:

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Tries
Compressed Tries
Suffix tries
Constructing Suffix Tries
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FINAL TAKEAWAY:

The project experience was remarkable.I had so much fun in learning.
I would to do more projects in the future.
Also the bootcamp was helpful.