

Web of Knowledge

Group Members:

- Maryam Fatima (290479)
- Fatima Seemab (291310)
- Mahum Samar (290647)



Introduction

We were given a data set of research publications in the CSV format. Firstly, we parsed the data of each article from the given data set. In the second phase, we declared the appropriate classes and data structures to be able to store the data of all the articles. In the last phase, various functions to analyze the data the details of which were given in the document were implemented.



Hash Table

Used hash tables to store data of main classes:

- Article
- Author
- Journal

Used prime sized Hash Tables.

Collision resolution by:

- Separate chaining using AVL Trees

Hash Function

Dependent on all the bits of the key

Pros

Complexity of Big-O(1)

AVL Tree

Used to store data of:

- Articles in Author class
- Authors in Article class
- Journal in Article class

Pros

Complexity of Big-O(log n base 2)

Graph

Used hash table with AVL tree

- Hash Table used to store the master list of all the author vertices.
- Each author vertex maintains the AVL tree of all the other vertices that it is connected to.

Pros

- Dynamic representation
- Space-efficient
- Allows to easily find all the links adjacent to a particular vertex

Recursion

Used recursion for traversing:

- AVL Trees
- Authorship Graph

Circular Queue

Array-based implementation of the circular queue used in the implementation of Breadth-First Traversal Algorithm.

Pros

Space-efficient

Organization

Data Storage

Data stored in objects of classes:

- Author
- Article
- Journal

having some AVL Tree type attributes.

Pointers of these objects were used in

- AVL Tree Nodes



Functions

Author's Publication

AVL Tree used as the Author class attribute.

Publications per Year

Used AVL Tree storing number of publications per year.

Co-Authors per Publication

Co-Authors per publication stored using AVL Tree.



Functions

Publications for each Author Position

Position attribute stored in articleWritten Node in AVL Tree ordered by position.

Journal

Publications in Journal sorted by year again AVL Tree used.

Authorship Graph

Adjacency AVL Tree-based implementation.





Additional Functionalities

View



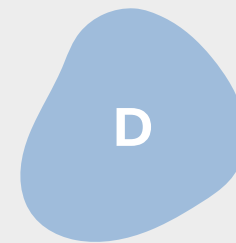
Journals



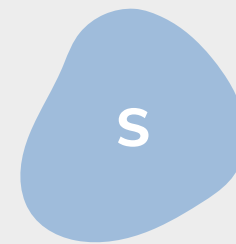
Authors



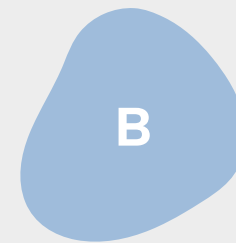
Articles



DFT



Search Author



BFT

Work Distribution



Maryam

- Author class and Hash Table
- Authorship Graph
- BFS and DFS
- Total number of articles published by an Author

Fatima

- Article class and Hash Table
- Total number of articles published by an Author
- Publications of an author per year sorted time wise
- Numbers of papers published by an author x for each author position

Mahum

- Journal class and Hash Table
- Total number of articles published by an Author
- The number of co-authors of an author x per publication sorted timewise.
- Sorted timewise, prints the name of the journal in which an author x has published his research work