**DATA STRUCTURES AND ALGORITHM**

**PROJECT**

**REVIEW-3**

**Food delivery system using binary search trees and doubly linked list used as queue**

ABSTRACT:

IN THIS PROJECT WE AIM TO DEVELOP A COMPLETE VIRTUAL FOOD DELIVERY SYSTEM WITH MULTIPLE MODES OF ACCESSING THE PROGRAM AND SIMULATE A REAL WORLD OPERATION OF A FOOD DELIVER APP. WE INTEND TO USE BINARY TREES AND QUEUES TO AID IN OUR VIRTUAL FOOD DELIVERY SYSTEM WHICH INVOLVES THREE WAY INTERACTION . THE SOFTWARE CAN BE ACCESSED AS

A CUSTOMER, AN EMPLOYEE AND A RESTAURANT OWNER. WE INTEND TO HAVE FEATURES SUCH AS CASH FREE PAYMENTS AND ORDER HISTORY SO WE HAVE DECIDED TO STORE CUSTOMER INFORMATION IN A BINARY SEARCH TREE WITH EACH NODE HOLDING DETAILS SUCH AS CUSTOMER NAME , ID , CASH BALANCE , CURRENT ORDER SUMMARY, ETC.. ON THE EMPLOYEE SIDE WE INTEND TO USE THE PRIORITY QUEUE DATA STRUCTURE USING DOUBLY LINKED LIST TO HANDLE ORDER ON PRIORITY BASIS. THE LIST OF RESTAURANTS THAT WILL BE USED WILL BE STORED IN A TEXT FILE. EACH RESTAURANT WILL FURTHER HAVE INDIVIDUAL DATA FILES WHICH WILL HAVE THE MENU. THE EMPLOYEE SIDE OF THIS PROGRAM WILL ALSO HAVE AN OPTION TO ADD OR DELETE

RESTAURANTS FROM THE DATABASE. WE ALSO INTEND TO

HAVE A SUBPROGRAM OR A SECONDARY PROGRAM THAT

WOULD ALLOW RESTAURANTS TO CHANGE THEIR MENU ACCORDINGLY.

**Binary Search Tree** is a node-based binary tree data structure which has the following properties:

* The left subtree of a node contains only nodes with keys lesser than the node’s key.
* The right subtree of a node contains only nodes with keys greater than the node’s key.
* The left and right subtree each must also be a binary search tree.

SUCH TREES ARE GENERALLY USED TO STORE LARGE DATA SUCH AS A CLIENT DATABASE.

THESE TREES ARE SPECIALLY USEFULL IN SEARCHING A RECORD AS THE SEARCHING ARLGORITHM USED IN THESE TREES HAVE A TIME COMPLEXITY OF O(log h), AS COMPARED TO STANDARD SEARCHING ALGORITHMS.

a **priority queue** is an [abstract data type](https://en.wikipedia.org/wiki/Abstract_data_type) which is like a regular [queue](https://en.wikipedia.org/wiki/Queue_(abstract_data_type)) or [stack](https://en.wikipedia.org/wiki/Stack_(abstract_data_type)) data structure, but where additionally each element has a "priority" associated with it. In a priority queue, an element with high priority is served before an element with low priority. In some implementations, if two elements have the same priority, they are served according to the order in which they were enqueued

## **KEYWORDS**

Binary search treess, multiple File-handling in c++, Queue using doubly linked list, Data base management system.