

Data Structures

DEPARTMENT	<u>Computación, Electrónica y Mecatrónica</u>	COURSE	LIS 3042
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Final Project

DUE DATE: 26-11-2024

Introduction

The objective of this project is to provide students with experience in creating data structures for searching and retrieving items.

The main theme of the final project is an inventory management system. It helps businesses keep accurate records of the products or goods they have in stock, manage stock levels, and automate processes related to inventory control, purchasing, and sales. So, the data structure used for the storage of the products can be crucial.

Problem Description

Create a program to manage the product inventory registered in a supermarket. The products will be stored in a Binary Tree (AVL BST or HEAP) data structure **and** Hash Table (to be defined). These data structures allow for efficient search, insert, update, and delete operations.

For each product, its ID, name, number of items, cost, entry date, and its priority level will be stored. The priority level can store a numeric value (or any other data type) that represents the priority level of the node. For example: a lower numeric value in the priority of a product indicates that it is the product most requested by customers.

Description of the operations on the data structure:

- **Insert:** An number N of products can be added by 2 forms: keyboard and by file, requesting their product name, number of items, cost, entry date, and priority level
- **Delete Product.** It can be done in 4 ways:
 - A given product can be deleted using its name;
 - A given product can be deleted using its ID;
 - The first product in the binary tree can be deleted;

- The last product can be deleted from the binary tree.
- **Update** of a certain product can be in some of its data (cost, number of items, entry date). In case of updating its priority level it is necessary to reorder the binary tree.
- **Search and display data. It can be carried out as follows:**
 - By product name where its attributes (cost, amount, etc.) are showed.
 - By price where all product names that have the search price are displayed.
 - By entry date where all the names of the products that have the same date are displayed.
 - Show all products sorted by priority level
 - Show products sorted by price, and name

Notes:

- **Registration of two products with the same name should not be allowed.**
- **Consider all the operations described above.**

Deliverables:

- A final report (front page, introduction, problem description, solution, conclusion and references) describing the use of the data structure to solve the inventory management system problem
- Source code of program.

Elements to consider in the evaluation of your project:

	Score
Program	50
Final report	50
Total	100
Presentation (--participation) (26-11-2024)	