**National College of Ireland**

**Data Structures**

**Higher Diploma in Computing Software Development**

**HDCSDEV\_INT**

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**1. About Stacks…**

Stacks follow the concept of last-in, first-out (LIFO), and following this idea, the application of this approach should aim at the last movement performed. Therefore, examples in which I see the application of this concept would be, Tracking Deliveries, History of Financial Transactions and a Management System that seeks to Review Documents.

Briefly speaking about each of the chosen items, I start with Delivery Tracking, where the item to be moved will be based on the last position added.

Regarding the history of Financial Transactions, the last updated value in the list will be the new reference for future updates.

Finally, a Document Review Management System, in which the last revised version will be the basis for a future review of the document in question.

**2. Sequential Search & Binary Search…**

The main advantage of sequential search is the easy implementation and understanding of the reasoning applied.

The main disadvantage is related to the runtime because in cases where the list is really large, added with the position of the element to be found, the runtime can become a big problem since it is linear and can be represented by O(n).

Regarding binary search, the advantage in which I highlight is related to efficiency, especially for gigantic lists.

The disadvantage to be mentioned is the need for these lists to be organized, which in some cases can be considered a challenge.

**4. Removing item from the tree**

**A diagram of a family tree

Description automatically generated**

**A diagram of a company

Description automatically generated**

**A diagram of a company

Description automatically generated**