****

**Act 1.3 - Comprehensive Activity of Basic Concepts and Fundamental Algorithms**

**Professor**

**Ricardo Peña**

**Jorge Gonzales**

**Javier Eric Hernández A01635390**

**Programming of Data Structures and Fundamental Algorithms**

**(Group 613)**

**Tecnológico de Monterrey Campus Guadalajara**

September 05 2022

Individually, carry out an investigation and reflection on the importance and efficiency of the use of the different sorting and searching algorithms in a problem situation of this nature, generating a document called "**ReflexAct1.3**.pdf

A sorting algorithm is used to arrange elements of an array/list in a specific order. Examples of this include Bubble Sort, Selection Sort, Insertion Sort, Merge Sort and Quicksort. The usefulness of each of this algorithm varies by project. It mostly depends on the need, the complexity and the stability of each of them. A sorting algorithm is considered stable if the two or more items with the same value maintain the same relative positions even after sorting.

|  |  |  |
| --- | --- | --- |
| Algorithm | Mean Complexity | Stability |
| Bubble Sort | n^2 | Yes |
| Selection Sort | n^2 | No |
| Insertion Sort | n^2 | Yes |
| Merge Sort | n log(n) | Yes |
| Quicksort | n log(n) | No |

The search algorithms work in a similar matter, they are designed to check for an element or retrieve an element from any data structure where it is stored. All these algorithms work in different ways for implementation.

Efficiency is key in a problem of this nature because of the great quantity of the data entry. Code efficiency is a great part of thing related with applications in high execution speed.