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SANTA BARBARA · SANTA CRUZ

CSE 30: Data Structures
Laboratory 6

Due Date: Friday, November 6, 2020 at 9:00 pm

Introduction

In this lab we will explore some concepts related to keeping things in order. You will be creating a new data structure, that is always guaranteed to be sorted.

Support Code

You are given the support code folder with all the header files we have worked with this semester, including Linked Lists, Resizable Arrays, Time Support, Random Support, and the Sorting Algorithms. You may use any and all of these as you see fit.

Tasks

Create a new data structure (struct) called `SortedArray`, which is a sorted resizable array. It should have an `insert` function that takes in a `long` and inserts it in the appropriate position in the array, so that the array remains sorted. Your sorted array must be initialized as an empty array when we declare it, and it can only be populated using its `insert` function.

Your `insert` function must be as efficient as possible. In a comment above the function implementation, explain its order of complexity. If it has a best/worst case, then identify the complexity of each, and explain the circumstances under which the cases will be exhibited.

Your `insert` must be properly unit tested. Please write as many unit tests as you feel is necessary to convince us that your implementation is correct.