SE 2228: Worksheet 1

07.07.2022

**Q1)** Implement a program that computes the Fibonacci sequence iteratively and recursively. Print the runtime of the both algorithms. Comment on which one is faster and discuss the reason of this time difference.

Note: You can use chrono library to compute the runtime of a specific function. An example is given below:

#include <chrono>

auto start = std::chrono::high\_resolution\_clock::now();

int result = function\_x();

auto finish = std::chrono::high\_resolution\_clock::now();

cout << "The function took " << std::chrono::duration\_cast<std::chrono::milliseconds>(finish - start).count() << " milliseconds" << endl;

**Q2)** Implement the binary search and linear search algorithms. Compare their runtime working on an array of 100000 elements. Analyze the difference and discuss about the results.

Note: Please remember that binary search will only work accurately on a sorted array.

**Q3)** Implement a binary search tree with the following elements:

{10, 5, 1, 7, 40, 50}

Then, print the inorder traversal of the tree.

Note: You can use the given bst header file for your implementation. However, the inorder traversal function is not added. You have to revise the header file accordingly to support that functionality.