

COSC 3100 – Data Structures II

Assignment 3

Deadline September 18, 2023

Develop an 'ArrayList' template class with the following member functions:

ArrayList(int size = 10);

A constructor to create an array of size 10, unless other specified.

~ArrayList();

A destructor to delete the array

ArrayList(const ArrayList<T>& a);

A copy constructor to make a copy of an existing ArrayList.

void insert(const T& item);

Insert 'item' into the list.

The list should store values in **descending order**.

If an item is being inserted and the list is full then the list should be increased in size by 10.

bool isFull() const;

Determine if the list is currently full.

bool isEmpty() const;

Determine if the list is currently empty.

int listSize() const;

Return the current number of values in the array.

void print() const;

Display the list.

int binarySearch(const T& item) const;

A function that can be called by the user of the class to search for a particular 'item'. If found, the function should return the index of 'item', and if not found it should return '-1'. This function should invoke a **recursive binary search process**.

Write a 'main' function in which an ArrayList of size 10 is created for values of type 'int', and another ArrayList of size 5 is created for Stock objects. Write code in 'main' to test each of the member functions and show that they work correctly.

THE DEPARTMENT STANDARDS FOR "STYLE GUIDELINES" SHOULD BE FOLLOWED IN ALL CODE.