Discipline of Computing and IT
University of Newcastle

SENG1120/6120 – Semester 1, 2018
Lab 8 (Week 9)

Video guides: https://www.youtube.com/watch?v=5J2khn1hmv4

https://www.youtube.com/watch?v=RdIodAUUVVU

This week's laboratory provides practice in use of recursion for binary search. Make sure you include full documentation, macro guards, etc with your code.

1. Write a function template `compare` that takes as parameters references to two instances of `Item`, and returns:

- -1 if the first `Item` is smaller than the second;
- 0 if the `Items` are equal;
- 1 if the first `Item` is bigger than the second.

You may assume that the operators <, ==, > and != have been defined (overloaded) for class `Item`.

2. Write a recursive function template that implements a binary search algorithm to search for a parameter-provided `Item` in a sorted array of references to instances of `Item`.

The function, which is called `find`, returns the index of the cell containing the occurrence if it is found, and -1 otherwise. Parameters to find are: a reference to the array to be searched; a reference to the target `Item`; the index of the first cell of the range of cells to be searched; the index of the last cell in the range of cells to be searched.

3. Test your work by populating arrays of `int` and `string`, and then searching for data in those arrays.

Extension question:

4. Write a class template `ASet` that uses an array to store a set of up to 20 references of `Items` arranged in ascending order. Member functions for `ASet` will include `add`, `remove`, `search` and `toString`. Write a program that demonstrates your work.

Good Luck!