DEPARTMENT OF
COMPUTER SCIENCE

CMSC 132

Object-Oriented Programming II

Spring 2025

Week 14 **A Few Review Problems**

UNIVERSITY OF MARYLAND FEARLESSLY FORWARD

Sort Algorithms

Using the values shown in the array, demonstrate Insertion Sort and Selection Sort

6	1	3	7	5	2	8	4	3

Sort Algorithms

Using the values shown in the array, what will be the order after the completion of one iteration of the outer loop of an QuickSort using the middle value as the pivot

6	1	3	7	5	2	8	4	3

Sort Algorithms

Using the values shown in the array, show the steps using Merge Sort

6	1	3	7	5	2	8	4	3

Recursion

Write a recursive method that adds the values from an array into an ArrayList.

```
public void addValues(int[] vals, ArrayList<Integer> theList) {
```


Memory Map

Complete the memory map at the point marked //HERE

```
public class ListMem {
    public static ArrayList<Integer> theList = new ArrayList<>();

    public static void main(String args[]) {
    int[] vals = {2, 4, 6, 8};
    addValues(vals, 0);
    System.out.println("The ArrayList: " + theList.toString());
    }
    public static void addValues(int[] vals, int index){
        if(index < vals.length) {
            theList.add(vals[index]);
            addValues(vals, index + 1);
        } else {
            // HERE ****
            System.out.println("base case");
        }
    }
}
```


Binary Search Tree

Write a method to return the node with the second largest value in a binary search tree. The nodes of the tree hold unique integer values. If there is no second largest value, return the root node.