AP Computer Science

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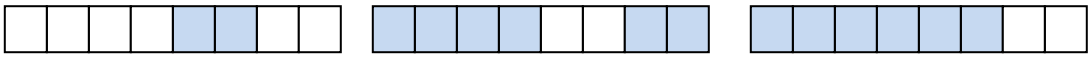
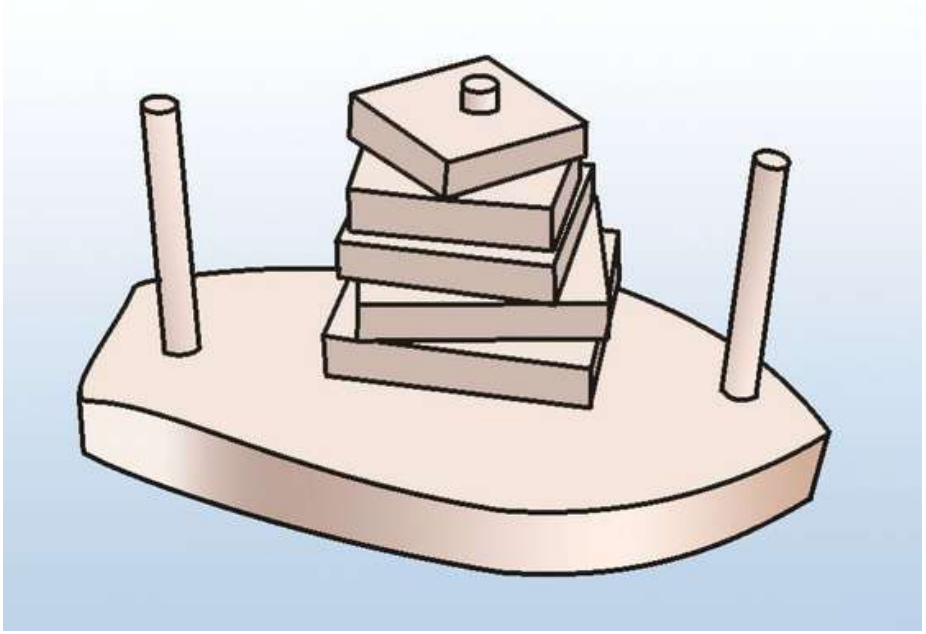
Assignment 12/1100_2/14_8/C_{16}

Binary **Ones Comp** **Twos Comp**



Stacks, Towers of Hanoi



1. Write a method that takes a String and reverses the order of the letters, using a stack.
   example input: GeorgeWBush
   example return value: hsuBWegroeG
   (NOTE: TO CREATE AN ArrayListStack, use ArrayListStack s = new ArrayListStack();)

2. Write a method that calls the method from a to determine if a word is a palindrome (a palindrome is a word that is the same backwards as forwards) Make sure you strip punctuation and spaces from the original String!!!

String*Arrays*ArrayList*Client Server*Artificial Intelligence*Inheritance*Files*Video Games*Short circuit evaluation*

* Dynamic Memory *Big O Notation*Stacks *Extreme Programming*Selection Sort*Insertion Sort*Waterfall Model

3. Create a towers of Hanoi program similar to the example C++ program provided by your instructor
   (NOTE: rendering a tower is awkward since you will find yourself having to empty all of the discs off of a stack to a temporary stack and then back)
   a. BONUS: Provide an Undo Feature for your Towers of Hanoi Program

DO NOT USE THE Stack THAT SHIPS WITH THE STANDARD JAVA LIBRARY, MAKE A Stack.java file for the interface and an ArrayListStack.java THAT HAS THE CODE FROM THE NOTES TO IMPLEMENT A STACK

Project Name 1	StackPalindromeExample
Class 1 Name	Stack.java (interface from class)
Class 2 Name	ArrayListStack.java(implementation of Stack from class notes)
Class 3 Name	StringRevAndPal.java (This class uses an ArrayListStack to reverse a String and test to see if a String is a palindrome)

Class	Purpose/Methods
Stack	**Contains Stack Interface as described by College Board**
ArrayList Stack	**Contains Stack Implementation from notes**
Tower	**Represents an individual Tower Some possible methods are; addDisk() removeDisk()**
TOHModel	**Contains an array of Towers Some possible methods are; moveDisk(int from, int to) checkForWin() newGame()**
TOHApp	**Makes an instance of the Frame**
TOHFrame	**Contains this ; TOHModel tm = new TOHModel(); And 6 buttons for movement Also has an instance of the HanoiPanel**
HanoiPanel extends JPanel	**Tower[] towArray; //Object that**

(This is created and owned by the TOHFrame)	links //HanoiPanel and Tower
	
	public HanoiPanel(Tower[] t) {
	towArray = t;
	}
	
	public void paintComponent(Graphics g) {
	super.paintComponent(g);
	//Let's paint the three towers
	paintTowers(g);
	}
	public void paintTowers(Graphics g) {
	ArrayListStack temp = new ArrayListStack();
	…more logic needed to render towers

Rubric	
Reverse	25
Palindrome	15
Towers of Hanoi	100
Towers of Hanoi GUI BONUS	25
Comments	10
TOTAL without Bonus	150

*Recursion*Linear Search*Binary Search*Grid World Case Study*File Processing *nlogn*Hangman*