

# AP Computer Science



Mr Hanley



## Assignment $10/1010_2/12_8/10_{16}$

Binary



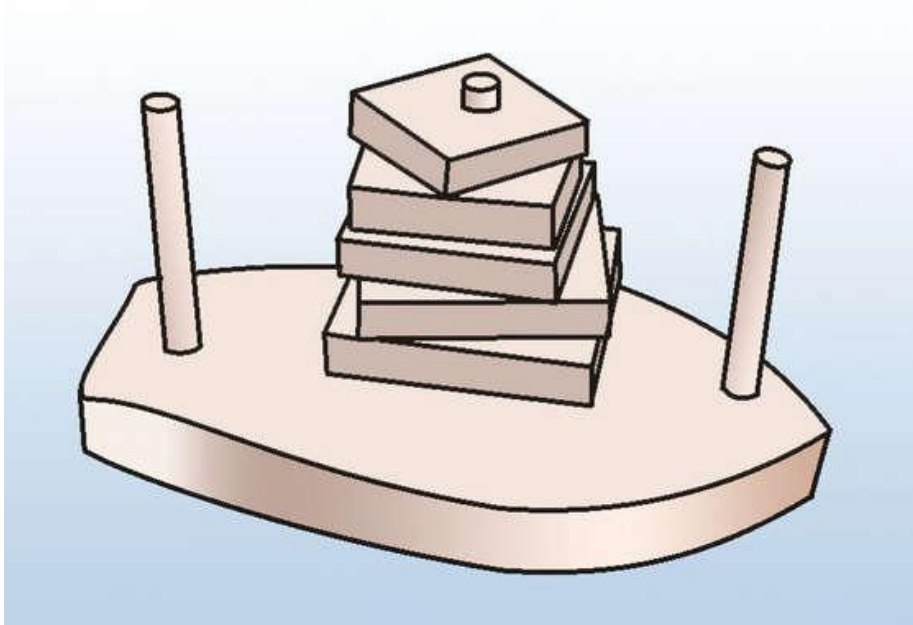
Ones Comp



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!!!

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**

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

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

<b>Class</b>	<b>Purpose/Methods</b>
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 (This is created and owned by the TOHFrame)	Tower[] towArray; //Object that links //HanoiPanel and Tower  <pre> 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 </pre>