

# AP Computer Science



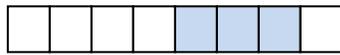
Mr Hanley



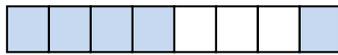
Assignment 14/1110<sub>2</sub>/16<sub>8</sub>/E<sub>16</sub> Version: 2.0

Last Updated: 3/16/2016 10:33 PM

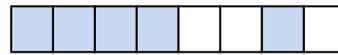
Binary



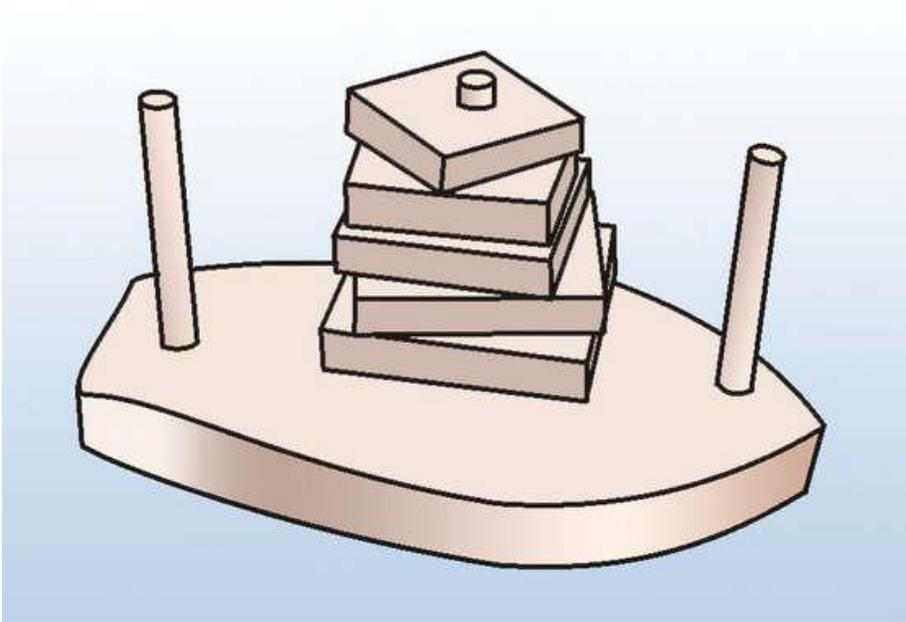
Ones Comp



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 ArrayStack, use `ArrayStack s = new ArrayStack();`)

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!!!

Punctuation that needs removing(minimum)

. (need \\. for this one, thanks to Jason Blowers, 2017)

“(Double Quote)

,(Comma)

‘ (Apostrophe)

spaces

But, how oh Jedi Master do I remove punctuation?

I am glad you asked.

There is a nifty command in the String class called replaceAll

You say something like `s = s.replaceAll(" ", ""); //replace spaces`

`s = s.replaceAll("\\.", ""); //special escape sequence to remove periods`

All of the periods and spaces will be replaced by nothing, which means you want have any periods.

But how the heck do I replace a “ since it requires a “?

Yeah, you need an escape sequence to handle a character like “

Use \” to indicate “

Use \\ to indicate a single \

Use \' to indicate a single ‘

**Examples: Go hang a salami, I’m a Lasagna Hog**

**gohangsalamiimalasagnahog**

-----  
**| Palindrome\*\*\*\*WooHoo|**  
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Testing this bad boy would be really nice to be able to have a whole bunch of phrases in a text file and then blasting through that file, concluding that a phrase is a palindrome or isn’t.

To this end, you can use the cookbook section on redirecting System.in and System.out.

Use the text file from my web site to process the file of possible palindromes

Print the phrase and then either \*No Palindrome\*

or

```
////////////////////////////////////  
// PALINDROME //  
////////////////////////////////////
```

Make sure you have a menu that allows for 4 options

1 = Reverse

2 = IsPalindrome

3 = Batch Is Palindrome (reads in a text file of phrases, testing all)

4 = Quit

3. Create a towers of Hanoi program similar to the example C++ program provided by your instructor
  - a. Your game must allow between 3 and 8 disks
  - b. Must move from original tower to one of the other towers
  - c. Must be able to be reset.  
(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)
  - d. 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)

Class	Purpose/Methods
Stack	Contains Stack Interface as described by College Board
ArrayStack	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 3 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>

Rubric	
Reverse	25
Palindrome	15
Towers of Hanoi	100
Towers of Hanoi GUI BONUS	25

<b>Comments</b>	<b>10</b>
<b>TOTAL without Bonus</b>	<b>150</b>

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