Homework Due January 17

Read through all this homework due January 17 and design your plan to complete at least the first page over the holiday. Keep in mind an open-book test will be posted on January 10. The test will also be due January 17. So, don't save all your work for the last minute. Only the first page of this homework is considered required homework. The bonus subsequent pages would make great Christmas presents to me!

Thinking section – we need to prepare for the ramifications of what we code in the future.

Watch the video "Should We Fear Artificial Intelligence" with John Lennox. https://www.youtube.com/watch?v=njU4u2hMFnE&feature=share Start the video at time = 18:23 (min:sec). You can be finished at time = 1:11:10 (hr:min:sec).

1. What are some of the areas of life mentioned in the video that will be affected by AI?
2. What is narrow AI?
3. What is general AI?
4. Take some notes to help you discuss in class.

Read the short story "Evidence" by Isaac Asimov. It can be found in the book *I, Robot*. I have also found it free online.

1. What are Asimov's three laws of robotics?
2. What laws would you add or edit from the three laws?
3. Take some notes to help you discuss in class.

Coding section

Continue your reading in the *JavaScript for Kids* text on page 96 starting at the LOOPS section. Finish reading the rest of the chapter. Complete the TRY IT OUT! on page 102. Do your best to turn in all three programming challenges via email at the end of the chapter. IF YOU NEED HELP, SEND ME AN EMAIL! I will not be available from January 4 through January 12. Plan accordingly.

See next page…

*** Bonus Section ***

Challenge One (of Three) - The Christmas Tree

```
<!-- Change the number of tiers on this Christmas tree.  Make a few of your
own edits or just add comments explaining the code in the JavaScript section
between the script tags.  Copy the code below into your text editor and save
it as a .html file to get started.  The code runs off this page onto the
next.  Good luck! -->


<!DOCTYPE html>
<html>
<head>
   <title>Merry Christmas</title>
</head>

<body>
<h1 style="color:red;"><center>Merry Christmas!</center></h1>
<br>
<br>
<br>
<br>
<center><script>
var maxLength = 9;
var tiers = 5;
var rows = 1;

for(i=0;i<tiers;i++) {
  if (i != 0) {
     maxLength += 4;
         rows = Math.ceil(maxLength/2);
         rows += 2;
  }

  for (j=rows; j<= maxLength; j+=2) {
     for (k=1;k<=j;k++) {
       document.write("*");
     }
     document.write("<br>");
  }
}
if (tiers === 1) {
   tiers += 1;
}

for (m=0;m<tiers-1;m++) {
   for (n=0;n<tiers;n++) {
      document.write("*");
   }
```

```
   document.write("<br>");
}
</script></center>
<body>
</html>
```

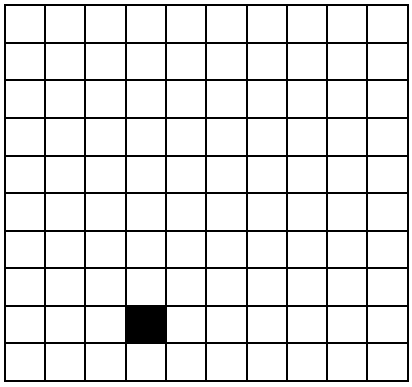
Challenge Two – Hangman

```
<!-- This is the beginning Hangman code from the book before the programming
challenges from the book are applied to it.  Copy this code into your text
editor.  Add comments to show what you understand of it.  There are a few
lines of code you won't understand yet.  This is an optional challenge, but
it is practical as you will need to understand this for later required
assignments.  This code doesn't all fit on this page.  Good luck! -->

<!DOCTYPE html>
<html>
<head>
    <title>Hangman!</title>
</head>
<body>
    <h1>Hangman!</h1>
    <script>
    // Create an array of words
    var words = [
      "javascript",
      "monkey",
      "amazing",
      "pancake"
    ];

    // Pick a random word
    var word = words[Math.floor(Math.random() * words.length)];

    // Set up the answer array
    var answerArray = [];
    for (var i = 0; i < word.length; i++) {
      answerArray[i] = "_";
    }

    var remainingLetters = word.length;

    // The game loop
    while (remainingLetters > 0) {
      // Show the player their progress
      alert(answerArray.join(" "));

      // Get a guess from the player
      var guess = prompt("Guess a letter, or click Cancel to stop playing.");
      if (guess === null) {
        // Exit the game loop
        break;
```

```
      } else if (guess.length !== 1) {
        alert("Please enter a single letter.");
      } else {
        // Update the game state with the guess
        for (var j = 0; j < word.length; j++) {
          if (word[j] === guess) {
            answerArray[j] = guess;
            remainingLetters--;
          }
        }
      }
    // The end of the game loop
    }

    // Show the answer and congratulate the player
    alert(answerArray.join(" "));
    alert("Good job! The answer was " + word);
    </script>
</body>
</html>
```

Challenge Three – Adding in some AI

Remember the in-class game where the computer guesses where I am hiding on a square grid? The grid contains values for x including 1 through 10. Likewise, the possible y values include 1 through 10. I hard coded into my program my hiding place (4,9) with 4 standing for the x-coordinate and 9 representing the y-coordinate.



The location shaded in the grid above is (4,9). Even though we are counting down in the y direction, it will be positive for us. This is to practice how y values work in an html document.

The computer took random guesses to locate me. But the computer didn't have a "brain"!!! The computer guessed each guess like it was the first. It couldn't "remember" previous guesses. Let's give the computer a little AI (artificial intelligence)! Help the computer take better guesses.

Hint: The easiest solution is for the computer to methodically take guesses from position (1,1) to (10,10) rather than take random guesses. For each x value every y value would be checked until the computer guesses the correct coordinate. This would require a loop within a loop which is a "nested" loop.

You have all the coding tools you need to solve the easiest solution for this challenge once you have completed chapter 6, but this is the challenge of programming challenges. For those of you that choose to solve this, I wish you luck!

```
/*SEE HOW MANY GUESSES IT TAKES COMPUTER TO FIND ME ON 10 by 10 GRID.
This is the original code we looked at in class.  Your code will look very
different than this.  This is not a .html file.  Run in your console. */

var playerX = 4;  //I'm hiding at x-coordinate btwn 1 - 10
var playerY= 9;  //I'm hiding at a y-coordinate btwn 1 - 10

var cx = 0;  //initialize at 0 so console doesn't hold onto previous value
var cy = 0;  //ditto

var guesses = 0; //initialize guesses at 0

console.log("Your location is at: " + playerX + ", " + playerY + ".\n\n");

while (cx != playerX || cy != playerY) { //loop runs if at least one true

  cx = Math.floor(Math.random() * 10) + 1;  //computer's x guess 1 to 10
  cy = Math.floor(Math.random() * 10) + 1;  //computer's y guess 1 to 10

  ++guesses; //guess made, so increment guesses

  console.log("Number of guesses: " + guesses);
  console.log("The computer guesses: " + cx + ", " + cy + ".\n\n");

}

console.log("The computer found you!!!!");
```