

CSCI 161: Introduction to Programming I
Lab 10: Hangman (Arrays) Extra Credit
Due 12/9/08 by 11:59 PM

Goals

Write a program that plays a game of hangman with the user. It reads a dictionary of words to choose from.

Overview

1. Start a new **project** in Java – call it “Lab10”
2. Start a new **class** within the new project, call it “Hangman”
3. Create a .txt file which contains a list of 60 dictionary words (copy and paste from somewhere). Call it dictionary.txt
4. Using **comments** to write your name and information about this class.
5. Ensure you **comment appropriately**. Also notice the indentations that occur after each curly bracket. (control, shift, f)

Input Specifications:

sample of words in dictionary.txt:

```
60
abacus
abalone
abandon
brazen

:
:
zoom
zounds
zucchini
zygote
```

Code Completion

For this lab, you will be completing code. **Pink is an indication for you to complete the code.** Your comments will show me that you understand the code - I expect some investigation from your part.

Hint: Look at the entire code first before attempting any part of the code completion.

```

// Describe what this program does

import _____ //
import _____ //

public class _____ {

    public static final int MAX_GUESSES = 6;

    public static void main(String[] args) throws _____
    {
        introduction();
        _____ // create Scanner object

        _____ // create a File object that reads
dictionary.txt
        String[] dictionary = readDictionary(input);
        Random rand = _____;
        playManyGames(console, rand, dictionary);
    }

    // reads the dictionary file; first line indicates number of words
public static String[] _____(Scanner input) { // method
    // read first line, extract int
    int count = new Scanner(input.nextLine()).nextInt();
    String[] words = new String[count];
    int i = _____;
    _____ (input.hasNextLine()) {
        words[i] = input.nextLine();
        _____;
    }
    _____;
}

    // plays many games of Hangman
public static void playManyGames(Scanner console, Random rand,
                                String[] dictionary) {

    int games = 0;
    int wins = 0;

    // loop to play many games
do {
    _____; // increment games
    String word = dictionary[rand.nextInt(dictionary.length)];
    if (playGame(console, word) > 0) {
        wins++;
    }
    System.out.print("Do you want to play again? ");
}
while (console.next().toLowerCase().startsWith(_____));

    reportStats(games, wins);
}

    // Plays one guessing game and returns the number of
    // guesses needed to win the game.
public static int playGame(Scanner console, String word) {
    int guesses = 0;
    String guessLetters = "";

```

```

int missing = word.length();
print(word, guessLetters);

do {
    printGallows(guesses);
    System.out.println("Incorrect guesses = " + _____);
    guessLetters = getGuess(console, guessLetters);

    int oldMissing = missing;
    missing = print(word, guessLetters);
    if (missing == oldMissing) {
        // not found
        _____;
    }
} while (missing > 0 && guesses < MAX_GUESSES);

if (missing == 0) {
    System.out.println("You won in " + guesses + " guesses.");
} else {
    printGallows(guesses);
    System.out.println("You lose.");
    System.out.println("The correct answer was " + word);
}

System.out.println();

_____ guesses;
}

// Draws a hangman figure with appropriate body parts for the
number
// of incorrect guesses, adding a head, torso, legs, and arms.
public static void printGallows(int guesses) {
    System.out.println(" +--+");
    System.out.println(" |  |");
    if (guesses == 0) {
        System.out.println(" |");
    } else {
        System.out.println(" |  O");
    }
    if (guesses <= 1) {
        System.out.println(" |");
    } _____ (guesses <= 4) {
        System.out.println(" |  |");
    } _____ (guesses == 5) {
        System.out.println(" |  |\\");
    } else {
        System.out.println(" |  /|\\");
    }
    if (guesses <= 2) {
        System.out.println(" |");
    } else if (guesses == 3) {
        System.out.println(" |  \\");
    } else {
        System.out.println(" |  /  \\");
    }
    System.out.println(" |");
    System.out.println(" +-----");
}

```

```

}

public static int print(String word, String guesses) {
    int missing = 0;
    for (int i = 0; i < word.length(); i++) {
        char letter = word.charAt(i);
        if (guesses.indexOf(letter) >= 0) {
            System.out.print(letter);
        } else {
            System.out.print(".");
            _____;
        }
    }
    System.out.println();
    _____;
}

// Prompts the user for a number guess and returns it.
public static String _____(Scanner console, String guessLetters)
{
    System.out.println(guessLetters);
    System.out.print("Guess a letter: ");
    String guess = _____.next();
    while (guessLetters.indexOf(guess) >= 0) {
        System.out.print("Invalid letter, try again: ");
        guess = console.next();
    }
    System.out.println();
    return guessLetters + guess;
}

// Prints introductory information about the program.
public static void introduction() {
    System.out.println(_____)

    System.out.println();
}

// Prints the statistical information at the end of the program
// about all games.
public static void reportStats(int games, int wins) {
    System.out.println();
    System.out.println("Overall results:");
    System.out.println("total games    = " + games);
    System.out.println("total wins      = " + wins);
    System.out.println("win percentage = " + round2(100.0 * wins /
games));
}

// Rounds the given real number to the nearest hundredth.
public static double round2(double number) {
    return Math.round(number * 100.0) / 100.0;
}
}

```

Output:

This program plays the game of hangman. I will pick a word at random and you guess my word. Good Luck!

```
.....
+---+
|   |
|   |
|   |
+-----
Incorrect guesses = 0
```

Guess a letter: a

```
.....
+---+
|   |
|   0
|   |
+-----
Incorrect guesses = 1
```

a
Guess a letter: e

```
...e..e....e
+---+
|   |
|   0
|   |
+-----
Incorrect guesses = 1
```

ae
Guess a letter: i

```
...e..e..i.e
+---+
|   |
|   0
|   |
+-----
Incorrect guesses = 1
```

aei
Guess a letter: o

```
...e..e..i.e
+---+
|   |
|   0
|   |
+-----
```

