Module 3 – Case Study – WordGuess

- A game that allows the player to guess the letters of a secret word, similar to hang man
- As the user guesses the correct letters, dashes are replaced with the letters

Specifications for WordGuess

- Computer plays a single player
- Secret word is BRAIN, game starts with 5 dashes -----
- When a matching letter is guessed, it replaces the corresponding dash
- Uppercase or lowercase can be entered, only uppercase displayed
- If the player enters an exclamation point (!), they can guess a word and WIN or LOSE
- Or the player can continue to guess letters until word is revealed
- At the end, the player is shown the total number of guesses

Output Sketch for WordGuess

```
WordGuess game.
-----
Enter a letter (! to guess entire word): a
--A--
Enter a letter (! to guess entire word):v
--A--
Enter a letter (! to guess entire word):!
--A--

What is your guess?
brain
You won!
The secret word is BRAIN
You made 3 guesses
```

The WordGuess Algorithm

1. Display a row of dashes to represent the word
2. Prompt the user for a letter guess
3. If the letter guessed is a part of the word, then display that letter in place of the corresponding dash
4. Repeat steps 2 and 3 until all the lterrs have been guessed or an exclamation point has been entered by the user
5. If an exclamation point has been entered , prompt the user to guess the entire word
6. If the player correctly guesses the entire word or all the letters have been guessed, then display a message indicating that the player has won, otherwise the message should indicate that the player has lost.
7. Display the secret word and the number of guesses

Pseudocode for WordGuess

```
Generate and display a set of dashes that represent the word
do
    update guesses counter
    prompt user for a letter
    convert to all uppercase
    determine if a letter is in word
    if letter is in word
        create new string that contains the guessed letter
while (all letters haven't been guessed and user hasn't chosen to guess the entire word)
if (! Has been entered)
    get a word guess from player
    convert word to all uppercase
if (word guessed equals secret word OR all the letters have been guessed)
    display message that player has won
else
    display message that player has lost
display secret word
display number of guesses
```

Testing and Debugging for RPS

- For this program it is necessary to test all possible values
- For example, the player may enter an exclamation point on the first guess
- Testing should also include incorrect word guesses

WordGuess implementation (pseudocode in handwriting)

```
/*
 * WordGuess.java from Module 5
 *
 */

import java.util.Scanner;

/**
 * Plays a word guessing game with one player.
 */
public class WordGuess {

      public static void main(String[] args) {
            final String SECRET_WORD = "BRAIN";
            final String FLAG = "!";
            String wordSoFar = "", updatedWord = "";
            String letterGuess, wordGuess = "";
            int numGuesses = 0;
            Scanner input = new Scanner(System.in);

            /* begin game */

            Generate and display a set of dashes that represent the word
            System.out.println("WordGuess game.\n");
            for (int i = 0; i < SECRET_WORD.length(); i++) {
                  wordSoFar += "-";                         //word as dashes
            }
            System.out.println(wordSoFar + "\n");           //display dashes

            /* allow player to make guesses*/
      do    do {
                  prompt user for a letter
                  System.out.print("Enter a letter(" +FLAG + " to guess entire word): ");
                  letterGuess = input.nextLine();
                  convert to all uppercase
                  letterGuess = letterGuess.toUpperCase();

                  /* increment number of guesses */
                  update guesses counter
                  numGuesses += 1;

                  /* player correctly guessed a letter--extract string in wordSoFar up to
                   * the letter guessed and then append guessed letter to that string.
                   * Next, extract rest of wordSoFar and append after the guessed letter
                   */
                  determine if a letter is in word


                  if letter is in word
                  if (SECRET_WORD.indexOf(letterGuess) >= 0) {
                        create new string that contains the guessed letter
                        updatedWord = wordSoFar.substring(0, SECRET_WORD.indexOf(letterGuess));
                        updatedWord += letterGuess;
                        updatedWord += wordSoFar.substring(SECRET_WORD.indexOf(letterGuess)+1,
wordSoFar.length());
                        wordSoFar = updatedWord;
                  }

                  /* display guessed letter instead of dash */
                  System.out.println(wordSoFar + "\n");

            while (all letters haven't been guessed and user hasn't chosen to guess the entire word)
            } while (!letterGuess.equals(FLAG) && !wordSoFar.equals(SECRET_WORD));

            /* finish game and display message and number of guesses */
            if (! Has been entered)
            if (letterGuess.equals(FLAG)) {

                  get a word guess from player
                  System.out.println("What is your guess? ");
                  wordGuess = input.nextLine();

                  convert word to all uppercase
                  wordGuess = wordGuess.toUpperCase();
            }
            if (word guessed equals secret word OR all the letters have been guessed)
            if (wordGuess.equals(SECRET_WORD) || wordSoFar.equals(SECRET_WORD)) {
                display message that player has won
                System.out.println("You won!");
            else
                display message that player has lost
            } else {
                System.out.println("Sorry. You lose.");
            }
            display secret word
            System.out.println("The secret word is " + SECRET_WORD);
            display number of guesses
            System.out.println("You made " + numGuesses + " guesses.");

        }
}
```