

**DEPARTMENT OF COMPUTER & INFORMATION SYSTEMS ENGINEERING  
BACHELORS IN COMPUTER SYSTEMS ENGINEERING**

Course Code: CS-115  
Course Title: Computer Programming  
Complex Engineering Problem  
FE Batch 2022, Fall Semester 2022  
TERM PROJECT

**Term Project Title:**  
**Hangman Game**

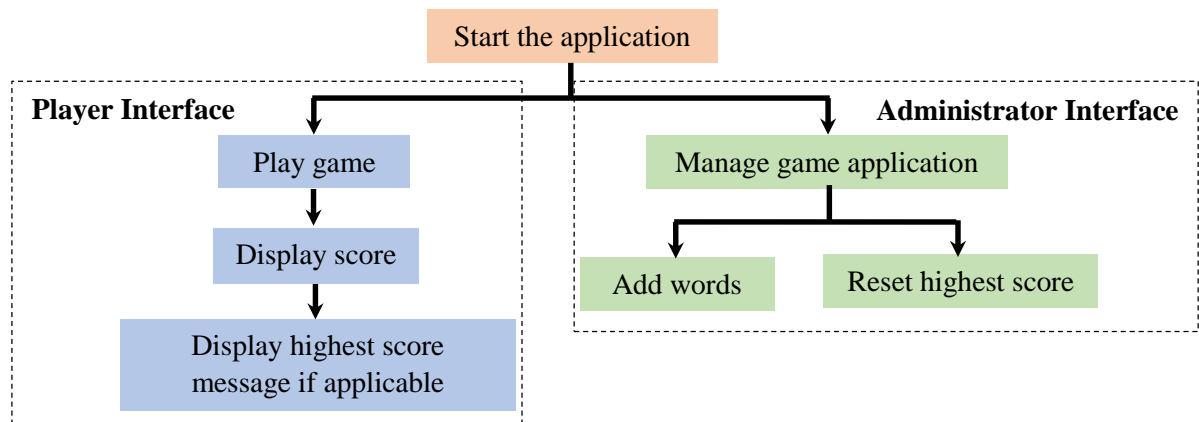
**Description:**

Your application will allow the user to play the classic word game *Hangman* against the computer. Your application maintains two interfaces: one for the player and one for the administrator, as shown in the following flow diagram. For the game, the computer picks a word, randomly from a list of available words, and the player tries to guess letters in the word. The player is given a certain number of guesses at the beginning. The game is interactive; as the player inputs his/her guess, the computer either:

- reveals the letter if it exists in the secret word
- penalize the user and updates the number of guesses remaining.

The game ends when either the user guesses the secret word, or the user runs out of guesses.

The following flow diagram depicts the overall working of the application:



**Game Rules and Interface**

- The computer must select a word called secret word at random from the list of available words. A file called word.txt is provided with this document that contains 55900 words in lowercase letters. This file must be loaded at the start of the program.
- Users start with 6 guesses and 3 warnings.
- At the start of the game, let the player know how many letters the secret word contains and how many guesses and warnings are remaining.
- The computer keeps track of all the letters the player has not guessed so far and before each turn shows the player the remaining letters.

- Ask the player to supply one guess at a time. Immediately after each guess, the player should be told whether the letter is in the secret word. Also, display to the player the secret word, with guessed letters displayed and un-guessed letters replaced with an underscore and space ( \_ ).
- The game accepts both upper and lower case letters as valid guesses. If the player inputs anything other than alphabets, prompt the user to enter valid input.
- If the player inputs a letter that hasn't been guessed before and the letter is in the secret word, the player does not lose any guesses or warnings.
- If the player inputs a consonant that hasn't been guessed and the consonant is not in the secret word, the user loses one guess if it's a consonant.
- If the vowel hasn't been guessed and the vowel is not in the secret word, the player loses two guesses.
- Each time the player inputs anything besides an alphabet (symbols, numbers) or a letter that has already been guessed, the player loses a warning. If no warnings are left, the player loses a guess.
- The game should end when the player constructs the full word or runs out of guesses.
- If the player runs out of guesses before completing the word, tell them that the game has been lost and reveal the word. The game ends.
- If the player wins, print a congratulatory message and tell the player the score calculated as follows:  
Total score = number of guesses remaining x number unique letters in the secret word
- The game must also keep track of the highest score along with the name of the player and displays a special message if the player achieves a new high score.
- Add an administrator interface which allow the administrator to:
  - add new words to the word file,
  - reset the highest score and name of the player.

### Sample Test Runs

The *red* color below is only there to show you what the user typed in, as opposed to what the computer output.

#### Winning Game

```

Loading word list from file...
55900 words loaded.
Welcome to the game Hangman!
I am thinking of a word that is 4 letters long.
You have 3 warnings left.
-----
You have 6 guesses left.
Available letters: abcdefghijklmnopqrstuvwxyz
Please guess a letter: a
Good guess: _ a _ _
-----
You have 6 guesses left.
Available letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: a
Oops! You've already guessed that letter.
You have 2 warnings left: _ a _ _
-----
You have 6 guesses left.
Available letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: s
Oops! That letter is not in my word: _ a _ _

```

```

-----
You have 5 guesses left.
Available letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: $
Oops! That is not a valid letter.
You have 1 warnings left: _ a _
-----
You have 5 guesses left.
Available letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: t
Good guess: ta_ t
-----
You have 5 guesses left.
Available letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: e
Oops! That letter is not in my word: ta_ t
-----
You have 3 guesses left.
Available letters: bcd fghijklmnopqrstuvwxyz
Please guess a letter: e
Oops! You've already guessed that letter.
You have 0 warnings left: ta_ t
-----
You have 3 guesses left.
Available letters: bcd fghijklmnopqrstuvwxyz
Please guess a letter: e
Oops! You've already guessed that letter.
You have no warnings left so you lose one guess: ta_ t
-----
You have 2 guesses left.
Available letters: bcd fghijkl n opquvwxyz
Please guess a letter: c
Good guess: tact
-----
Congratulations, you won!
Your total score for this game is: 4

```

### Losing Game

```

Loading word list from file...
55900 words loaded.
Welcome to the game Hangman!
I am thinking of a word that is 4 letters long
You have 3 warnings left.
-----
You have 6 guesses left
Available Letters: abcdefghijklmnopqrstuvwxyz
Please guess a letter: a
Oops! That letter is not in my word: _ _ _ _
-----
You have 4 guesses left

```

```

Available Letters: bcdefghijklmnopqrstuvwxyz
Please guess a letter: b
Oops! That letter is not in my word: _ _ _ _
-----
You have 3 guesses left
Available Letters: cdefghijklmnopqrstuvwxyz
Please guess a letter: c
Oops! That letter is not in my word: _ _ _ _
-----
You have 2 guesses left
Available Letters: defghijklmnopqrstuvwxyz
Please guess a letter: 2
Oops! That is not a valid letter.
You have 2 warnings left: _ _ _ _
-----
You have 2 guesses left
Available Letters: defghijklmnopqrstuvwxyz
Please guess a letter: d
Oops! That letter is not in my word: _ _ _ _
-----
You have 1 guesses left
Available Letters: efghijklmnopqrstuvwxyz
Please guess a letter: e
Good guess: e_ _ e
-----
You have 1 guesses left
Available Letters: fghijklmnopqrstuvwxyz
Please guess a letter: f
Oops! That letter is not in my word: e_ _ e
-----
Sorry, you ran out of guesses.
Correct word: else.

```

#### Some Extension Ideas (optional):

1. Maintain top three high scores with player names instead of just one.
2. Make some authentication process (username, password) for the administrator who can manage the quiz app.
3. Allow player to create an account with some basic information like username, password, first and last names, address, etc. Keep the record in a separate file along with the score history of the player.
4. Use GUI to improve the game interface.