

# Assignment 2 – Hangman

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## Purpose

The purpose of this program is to run the guessing game of Hangman in C code.

## How to Use the Program

To use this program it must be first compiled using "make format hangman.c" in inclusion with the make file in order to compile a hangman executable. In order to run this executable use the command "./hangman 'word'". 'word' in this case is the chosen hidden word for the game of Hangman. After which the game will load in. Then the player can type in a letter and press enter to submit their guess. This will either cause a part of the man to appear on the gallows or the letter will appear in the hidden word section if it matches any letters. This continues until either the entire stick figure becomes hung or the player fully guesses the word.

## Program Design

### Data Structures

Common data structures throughout the main helper functions include if statements and booleans. The reason for this is because of the presence of mainly boolean functions that check for true or false. Within the main function is a large do-while loop to hold the container of the game while tracking the total mistakes the player has made. Furthermore, are a varied amount of if and for loops which keep track of printing the graphics of the hangman and reading player input.

### Algorithms

These are pseudocode for the helper functions:

```
bool string contains a given character (char s, char c)
    if char c not in char s returns not NULL
        return True
    else
        return False
```

```
read input letter
    create char input variable
    prints prompt to input letter
    set input to getchar
    return input
```

```
if char c is lowercase
    if char c is greater than or equal to ASCII 'a' and less than
    or equal to ASCII 'z'
        return True
    else
        return False
```

```
If the secret word is valid
    create size variable length and set it equal to strlen of secret
    if this length is greater than 256
        print character limit error and return false
    for all of secret string
        if its not lowercase or present in punctuation
            print character input error
            return false
    return True
```

The pseudocode here represents the helper functions and how they are set up. The next set of pseudocode shows the basic layout of the main function.

```
main function
    takes in # of words and input string on file run
    if # of inputs is greater than 2
        print quotation error
        return 1
    if validate function is false
        return 1

    create mistake counter
    phrase array creation

    do while mistake counter less than MAX MISTAKES
        run clear
        print art based on mistake number
        print phrase
        print eliminated letters

        run guess letter and make sure lowercase
        if not rerun guess letter

        run string contains character on guess input
        if true
            run through string with pointer and replace
            phrase array '-' if letter matches on string
        if false
            increase mistake counter
            add to eliminated letter

        if phrase matches secret
            break out loop

    run clear
    if mistake equal to six or greater
```

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```
        print phrase
        print eliminated letters
        print lose message
    else
        print phrase
        print eliminated letter
        print win message
```

## Function Descriptions

Here are the function descriptions:

`bool string_contains_character`

- Target string, character being compared
- returns true if the character is present within the string, returns false if the character is not present within the string
- The purpose of this function is to check if the Target string contains the comparison character.
- Pseudocode is shown above

`char read_letter(void)`

- No direct inputs, prompts player to input character
- returns the player input character
- The purpose of this function is to give a quick method of reading a one character input from the player
- Pseudocode is shown above

`bool is_lowercase_letter(char c)`

- target character
- return true if the target character has an ASCII value between lowercase a and lowercase z else it returns false
- The purpose of this function is to check if the target character is a lowercase letter
- Pseudocode is shown above

`bool validate_secret(const char* secret)`

- target string
- returns true if the string is less than 256 characters in length and it contains only lowercase letters or the permitted punctuation else it returns false
- The purpose of this function is to check if the input string by the player to set up the game of hangman is within the rules of this program
- Pseudocode is shown above

## Results

## References