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**SCHOOL OF COMPUTER SCIENCE ENGINEERING
AND INFORMATION SYSTEMS**

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PMCA501L – DATA STRUCTURES AND ALGORITHM

DIGITAL ASSIGNMENT – 1

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PROGRAM: MCA

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Develop a game using any data structure of your interest.**JUMBLED WORD GAME****GAME DESCRIPTION**

In this Jumbled Word Game, players try to guess a word whose letters have been randomly scrambled. Each word gives the player up to three chances to guess correctly. If the first three attempts are unsuccessful, a last surprise attempt is given with a hint. Points are awarded for each correct guess: 10 points for a correct guess without a hint and 5 points if the hint is used.

Once a player has correctly guessed 12 words, the game will offer the option to continue or quit every time the player reaches an additional three correct guesses (e.g., after 15, 18, 21 correct guesses, and so on). This option appears only after each set of three correct guesses beyond the initial 10. The game ends if all the words are used, the player chooses to quit, or the player exhausts all attempts on a word without guessing correctly.

GAMEPLAY FLOW

1. The game displays a jumbled word.
2. The player has three attempts to guess the original word.
 - 10 points are awarded for a correct guess without using a hint.
 - 5 points are awarded if a hint is used and the player guesses correctly.
3. After the player's first 12 correct guesses, they will be prompted to continue the game or quit the game further on every three additional successful guesses with the choice to continue or stop playing.
4. The game ends if all words are used, the player chooses to quit, or the player exhausts all attempts on a word without guessing correctly.

SCORING

- 10 points for a correct guess without a hint.
- 5 points for a correct guess with a hint.
- The player's total score is displayed after each correct guess and at the end of the game.

GAME CODE:

```
#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#include <time.h>

void shuffleWord(char *word, int length, char *jumbledWord) {

    int i, j;

    int used[length];

    for (i = 0; i < length; i++) {

        used[i] = 0;

    }

    for (i = 0; i < length; i++) {

        do {

            j = rand() % length;

        } while (used[j] == 1);

        jumbledWord[i] = word[j];

        used[j] = 1;

    }

    jumbledWord[length] = '\0';

}

void displayJumbledWord(char *jumbledWord) {

    printf("Jumbled word: ");

    for (int i = 0; jumbledWord[i] != '\0'; i++) {

        printf("%c ", jumbledWord[i]);

    }

}
```

```
    printf("\n");
}

int checkGuess(char *word, char *guess) {
    return strcmp(word, guess) == 0;
}

int selectUniqueWord(char *words[], char *hints[], int wordCount, int usedWords[], int
*usedWordCount) {
    int index;
    do {
        index = rand() % wordCount;
    } while (usedWords[index] == 1);

    usedWords[index] = 1;
    (*usedWordCount)++;
    return index;
}

int main() {
    char *words[] = {
        "apple", "banana", "cherry", "grape", "mango", "orange", "kiwi", "papaya", "peach",
        "plum",
        "ocean", "mountain", "river", "valley", "desert", "forest", "island", "lake", "sea", "beach",
        "computer", "laptop", "keyboard", "mouse", "printer", "monitor", "processor", "router",
        "modem", "server",
        "biology", "physics", "chemistry", "algebra", "geometry", "calculus", "history",
        "geography", "literature", "philosophy",
```

```
"soccer", "tennis", "cricket", "basketball", "hockey", "golf", "rugby", "badminton",  
"volleyball", "baseball"
```

```
};
```

```
char *hints[] = {
```

```
    "fruit", "fruit", "fruit", "fruit", "fruit", "fruit", "fruit", "fruit", "fruit", "fruit",
```

```
    "nature", "nature", "nature", "nature", "nature", "nature", "nature", "nature", "nature", "nature",  
    "nature",
```

```
    "tech", "tech", "tech", "tech", "tech", "tech", "tech", "tech", "tech", "tech", "tech",
```

```
    "science", "science", "science", "math", "math", "math", "history", "history", "literature",  
    "philosophy",
```

```
    "sport", "sport", "sport", "sport", "sport", "sport", "sport", "sport", "sport", "sport", "sport"
```

```
};
```

```
int wordCount = sizeof(words) / sizeof(words[0]);
```

```
int usedWords[50] = {0};
```

```
int usedWordCount = 0;
```

```
srand(time(NULL));
```

```
char guess[20];
```

```
int score = 0;
```

```
int correctGuesses = 0;
```

```
printf("Welcome to the Jumbled Word Game!\n\n");
```

```
while (usedWordCount < wordCount) {
```

```
    int wordIndex = selectUniqueWord(words, hints, wordCount, usedWords,  
    &usedWordCount);
```

```
    char *selectedWord = words[wordIndex];
```

```
    char *hint = hints[wordIndex];
```

```
int wordLength = strlen(selectedWord);

char jumbledWord[20];

shuffleWord(selectedWord, wordLength, jumbledWord);


int attempts = 4;

int guessedCorrectly = 0;

while (attempts > 0) {

    displayJumbledWord(jumbledWord);

    printf("Enter your guess: ");

    scanf("%s", guess);


    if (checkGuess(selectedWord, guess)) {

        printf("Congratulations! You guessed the word correctly.\n");

        score += 10;

        correctGuesses++;

        printf("Your score: %d\n", score);

        guessedCorrectly = 1;

        break;

    } else {

        attempts--;

        if (attempts == 0) {

            printf("Hint: %s (Surprise Last attempt)\n", hint);

            printf("Enter your guess: ");

            scanf("%s", guess);

            if (checkGuess(selectedWord, guess)) {
```

```
        printf("Congratulations! You guessed the word correctly with the hint.\n");
        score += 5;
        correctGuesses++;
        printf("Your score: %d\n", score);
        guessedCorrectly = 1;
        break;
    }
} else {
    printf("Incorrect guess. Try again! Attempts left: %d\n", attempts);
}
}
}

if (!guessedCorrectly) {
    printf("Sorry, you've used all attempts. The word was '%s'.\n", selectedWord);
    break;
}

if (correctGuesses >= 10) {
    if (correctGuesses % 3 == 0) {
        char choice;

        printf("You've guessed %d words correctly! Would you like to continue playing?
(y/n): ", correctGuesses);

        scanf(" %c", &choice);

        if (choice == 'n' || choice == 'N') {
            printf("Thank you for playing! Your final score: %d\n", score);
```

```
        return 0;

    }

}

}

}

printf("Game over! Your final score: %d\n", score);

return 0;

}
```

OUTPUT:

```
Welcome to the Jumbled Word Game!

Jumbled word: h b a e c
Enter your guess: beach
Congratulations! You guessed the word correctly.
Your score: 10
Jumbled word: a a p a y p
Enter your guess: papaya
Congratulations! You guessed the word correctly.
Your score: 20
Jumbled word: u m o s e
Enter your guess: mmouse
Incorrect guess. Try again! Attempts left: 2
Jumbled word: u m o s e
Enter your guess: mouse
Congratulations! You guessed the word correctly.
Your score: 30
Jumbled word: m m d e o
Enter your guess: deomm
Incorrect guess. Try again! Attempts left: 2
Jumbled word: m m d e o
Enter your guess: mdeom
Incorrect guess. Try again! Attempts left: 1
Jumbled word: m m d e o
Enter your guess: odemm
Hint: tech (Surprise Last attempt)
Enter your guess: edomm
Sorry, you've used all attempts. The word was 'modem'.
Game over! Your final score: 30

Process returned 0 (0x0)   execution time : 45.239 s
Press any key to continue.
|
```


TEST CASES

Test Case 1: Successful Guess on First Attempt

Input:

Jumbled word: "ppayaa"

Player guess: "papaya"

Expected Output:

"Congratulations! You guessed the word correctly."

"Your score: 10"

Explanation: The player correctly guesses the word on the first attempt and earns 10 points.

```
Welcome to the Jumbled Word Game!  
  
Jumbled word: p p a y a a  
Enter your guess: papaya  
Congratulations! You guessed the word correctly.  
Your score: 10
```

Test Case 2: Hint Used and Successful Guess

Input:

Jumbled word: "dtmnanibo"

Player guesses: "mtdannboi", "mannibotd", "dobitmnan"

Hint provided: "sport"

Final guess after hint: "badminton"

Expected Output:

"Congratulations! You guessed the word correctly with the hint."

"Your score: 5"

Explanation: The player guesses incorrectly thrice, receives the hint, and then guesses correctly, earning 5 points.

```
Welcome to the Jumbled Word Game!

Jumbled word: d t m n a n i b o
Enter your guess: mtdannboi
Incorrect guess. Try again! Attempts left: 2
Jumbled word: d t m n a n i b o
Enter your guess: mannibotd
Incorrect guess. Try again! Attempts left: 1
Jumbled word: d t m n a n i b o
Enter your guess: dobitmnan
Hint: sport (Surprise Last attempt)
Enter your guess: badminton
Congratulations! You guessed the word correctly with the hint.
Your score: 5
```

Test Case 3: Exhausting Attempts Without Correct Guess

Input:

Jumbled word: "paoltp"

Player guesses: "ltpoap", "loatpp", "ppaolt"

Hint provided: "tech"

Final guess after hint: "aolppt"

Expected Output:

"Sorry, you've used all attempts. The word was laptop."

"Game over! Your final score: [previous score]"

Explanation: The player fails to guess the word correctly within three attempts, resulting in a game over.

```
Jumbled word: p a o l t p
Enter your guess: ltpoap
Incorrect guess. Try again! Attempts left: 2
Jumbled word: p a o l t p
Enter your guess: loatpp
Incorrect guess. Try again! Attempts left: 1
Jumbled word: p a o l t p
Enter your guess: ppaolt
Hint: tech (Surprise Last attempt)
Enter your guess: aolppt
Sorry, you've used all attempts. The word was 'laptop'.
Game over! Your final score: 5
```

Test Case 4: Reaching 12 Correct Guesses with Prompt to Continue**Input:**

Player correctly guesses 12 words.

System prompt: "You've guessed 12 words correctly! Would you like to continue playing?"

(y/n): "

Player input: "y"

Player correctly guesses 3 additional words.

System prompt: "You've guessed 15 words correctly! Would you like to continue playing?"

(y/n): "

Player input: "n"

Expected Output:

Game continues with the next jumbled word initially after 12 words

Explanation: After guessing 12 words correctly, the player is prompted to continue or exit. The player chooses to continue, and the game proceeds. The player then correctly guesses additional 3 words, then the player is again prompted to continue or exit. The player now chooses to exit and the game ends.

```
Welcome to the Jumbled Word Game!

Jumbled word: e h c a p
Enter your guess: peach
Congratulations! You guessed the word correctly.
Your score: 10
Jumbled word: u r y b g
Enter your guess: rugby
Congratulations! You guessed the word correctly.
Your score: 20
Jumbled word: p e l p a
Enter your guess: apple
Congratulations! You guessed the word correctly.
Your score: 30
Jumbled word: m o e u s
Enter your guess: mouse
Congratulations! You guessed the word correctly.
Your score: 40
Jumbled word: s a e
Enter your guess: sea
Congratulations! You guessed the word correctly.
Your score: 50
```

```
Jumbled word: e o r t r u
Enter your guess: router
Congratulations! You guessed the word correctly.
Your score: 60
Jumbled word: i t o n o m r
Enter your guess: monitor
Congratulations! You guessed the word correctly.
Your score: 70
Jumbled word: e r c k t c i
Enter your guess: cricket
Congratulations! You guessed the word correctly.
Your score: 80
Jumbled word: t a k e b a l s l b
Enter your guess: basketball
Congratulations! You guessed the word correctly.
Your score: 90
Jumbled word: b a n a a n
Enter your guess: banana
Congratulations! You guessed the word correctly.
Your score: 100
```

```
Jumbled word: p a e r g
Enter your guess: grape
Congratulations! You guessed the word correctly.
Your score: 110
Jumbled word: c s o r c e
Enter your guess: scocer
Incorrect guess. Try again! Attempts left: 2
Jumbled word: c s o r c e
Enter your guess: soccer
Congratulations! You guessed the word correctly.
Your score: 120
You've guessed 12 words correctly! Would you like to continue playing? (y/n): y
Jumbled word: u r t e c p o m
Enter your guess: computer
Congratulations! You guessed the word correctly.
Your score: 130
Jumbled word: o a r h g e y p g
Enter your guess: geography
Congratulations! You guessed the word correctly.
Your score: 140
Jumbled word: b a l a b s e l
Enter your guess: baseball
Congratulations! You guessed the word correctly.
Your score: 150
You've guessed 15 words correctly! Would you like to continue playing? (y/n): n
Thank you for playing! Your final score: 150

Process returned 0 (0x0)   execution time : 593.485 s
Press any key to continue.
|
```