**EX 9: Implement a C program that checks whether a given input string follows a predefined grammar**.

**Aim**

To implement a C program that checks whether a given input string follows a predefined grammar.

**Algorithm:**

1. Define a Grammar
   * Example: Consider a simple grammar for a valid English-like sentence.

javascript

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Sentence → Subject Verb Object

Subject → "I" | "You" | "We"

Verb → "eat" | "play" | "read"

Object → "food" | "cricket" | "book"

1. Accept an Input String
   * Read the input string from the user.
2. Tokenize the String
   * Split the input string into words (subject, verb, object).
3. Check Grammar Rules
   * Verify if the words appear in the predefined sets of subject, verb, and object.
   * If all words are correct and in the right order, the sentence is valid.
4. Display the Result
   * If the sentence follows the grammar, print "Valid Sentence".
   * Otherwise, print "Invalid Sentence".

**CODE:**

#include <stdio.h>

#include <string.h>

const char \*subjects[] = {"I", "You", "We"};

const char \*verbs[] = {"eat", "play", "read"};

const char \*objects[] = {"food", "cricket", "book"};

#define SUBJECTS\_SIZE 3

#define VERBS\_SIZE 3

#define OBJECTS\_SIZE 3

int isInList(const char \*word, const char \*list[], int size) {

for (int i = 0; i < size; i++) {

if (strcmp(word, list[i]) == 0)

return 1;

}

return 0;

}

void checkGrammar(char \*sentence) {

char \*subject, \*verb, \*object;

subject = strtok(sentence, " ");

verb = strtok(NULL, " ");

object = strtok(NULL, " ");

if (subject == NULL || verb == NULL || object == NULL || strtok(NULL, " ") != NULL) {

printf("Invalid Sentence!\n");

return;

}

if (isInList(subject, subjects, SUBJECTS\_SIZE) &&

isInList(verb, verbs, VERBS\_SIZE) &&

isInList(object, objects, OBJECTS\_SIZE)) {

printf("Valid Sentence!\n");

} else {

printf("Invalid Sentence!\n");

}

}

int main() {

char sentence[100];

printf("Enter a sentence: ");

fgets(sentence, sizeof(sentence), stdin);

sentence[strcspn(sentence, "\n")] = '\0';

checkGrammar(sentence);

return 0;

}

