**3. Write a lex program (lex3.l) to count and print the number of words (space separated), letters and vowels in a given sentence. Also, print the set of vowels observed in the given sentence**

%{

#include <stdio.h>

#include <ctype.h>

#include <string.h>

int word\_count = 0;

int letter\_count = 0;

int vowel\_count = 0;

int in\_word = 0;

int vowels\_seen[256] = {0}; // ASCII-based tracking

void add\_vowel(char c) {

if (!vowels\_seen[(int)c])

vowels\_seen[(int)c] = 1;

}

%}

%%

[ \t\n] { in\_word = 0; } // Whitespace ends a word

[A-Za-z] {

letter\_count++;

if (!in\_word) {

word\_count++;

in\_word = 1;

}

char lower = tolower(yytext[0]);

if (lower == 'a' || lower == 'e' || lower == 'i' || lower == 'o' || lower == 'u') {

vowel\_count++;

add\_vowel(yytext[0]);

}

}

. { /\* Ignore non-letter characters \*/ }

%%

int main(int argc, char \*\*argv) {

if (argc != 3) {

fprintf(stderr, "Usage: %s <input-file> <output-file>\n", argv[0]);

return 1;

}

FILE \*infile = fopen(argv[1], "r");

FILE \*outfile = fopen(argv[2], "w");

if (!infile || !outfile) {

fprintf(stderr, "Error opening input or output file.\n");

return 1;

}

yyin = infile;

yyout = outfile;

yylex();

fprintf(outfile, "Words = %d\n", word\_count);

fprintf(outfile, "Letters = %d\n", letter\_count);

fprintf(outfile, "Vowels = %d\n", vowel\_count);

fprintf(outfile, "Set = ");

for (int i = 0; i < 256; i++) {

if (vowels\_seen[i])

fprintf(outfile, "%c ", i);

}

fprintf(outfile, "\n");

fclose(infile);

fclose(outfile);

return 0;

}