

Name – Manoj Sri Sai Bodapudi

Roll no – CH.EN.U4CSE22131

Ex - 1

Aim:

Write simple Lex program to scan user input and tokenize it, demonstrating lexical analysis in compiler design.

a) Count the number of words, digits, spaces, and special characters.

Program:

```
1 %{
2 #include <stdio.h>
3 int word = 0, dgit = 0, spce = 0, spec = 0;
4 %}
5
6 %%
7 [ \t]+      { spce++; }
8 [0-9]+      { dgit++; }
9 [a-zA-Z]+   { word++; }
10 [^a-zA-Z \t\n0-9] { spec++; }
11 \n         ; // Ignore
12 %%
13
14 int main() {
15     yylex();
16     printf("Words: %d\nDigits: %d\nSpaces: %d\nSpecials: %d\n", word, dgit, spce, spec);
17     return 0;
18 }
19
```

Output:

b) Check Whether a Number is Even or Odd

Program:

```
1 %{
2 #include <stdio.h>
3 #include <stdlib.h>
4 %}
5
6 %%
7
8 [0-9]+    {
9             int num = atoi(yytext);
10            if (num % 2 == 0)
11                printf("EVEN number: %d\n", num);
12            else
13                printf("ODD number: %d\n", num);
14        }
15
16 [ \t\n]   ; // Ignore
17 .        { printf("Invalid input: %s\n", yytext); }
18
19 %%
20
21 int main() {
22     printf("Enter numbers separated by space:\n");
23     yylex();
24     return 0;
25 }
```

Output:

c) Classify given user input is integer or float.

Program:

```
1 %%
2 [0-9]+\.[0-9]+ { printf("Float: %s\n", yytext); }
3 [0-9]+         { printf("Integer: %s\n", yytext); }
4 [ \t\n]+      ;
5 .             ; // Ignore
6 %%
7
8 int main() {
9     yylex();
10    return 0;
11 }
```

Output:

d) Check and classify user input into website or not.

Program:

```
1 %%
2 [a-z]+\.[a-z]+ { printf("Website"); }
3 .+             { printf("Not a website"); }
4 [ \t\n]+      ;
5 %%
6
7 int main() {
8     yylex();
9     return 0;
10 }
```

Output:

e) Count the number of numbers, operators and symbols.

Program:

```
1 %%  
2 [0-9]+      { printf("Number: %s\n", yytext); }  
3 [+\\-*/]    { printf("Operator: %s\n", yytext); }  
4 [(\\)=]      { printf("Symbol: %s\n", yytext); }  
5 [ \\t\\n]+   ; // ignore  
6 .           { printf("Unknown: %s\n", yytext); }  
7 %%  
8  
9 int main() {  
10     yylex();  
11     return 0;  
12 }
```

Output:

Result:

Thus, successfully implemented Lex program to scan user input and tokenize it.