

EX NO: 9

C SCANNER USING LEX AND YACC

DATE :21.11.22

AIM:

write a lex and yacc program to implement C scanner for the following: variables, keywords, arrays, structures, files and functions.

PROGRAM:

EX9.1

```
% {  
    #include "EX9.tab.h"  
    char* checkspecifier(char*);  
  
% }  
var ([a-zA-Z]+[0-9]*)+  
special [+|*|_|\\| |-|?|\\%|/|  
inp [\\ ]*\\&([a-zA-Z]+[0-9]*)+[\\ ]*  
dtype (int|char|float)  
alp [a-zA-Z]  
num [0-9]  
sp (%d|%c|%f)  
%%  
(\\#include)\\<(stdio|conio|stdlib|string)\\.h\\>           { return HEAD; }  
(void)[\\ ](main)\\((.*)\\)                                { return MAIN; }  
{ dtype }[\\ ]{ var }(;)  
%s\\n",yytext);return LINE;}                             { printf("\\nValid Variable  
{ dtype }[\\ ]({ alp }+{ num }*)+(\\[ { num } *\\])+(;)  
%s\\n",yytext); return LINE;}                             { printf("Array valid  
(printf)\\(\\\"({ alp } * { num } * { special } *) * \"\\(, { var } *) *\\)\\)[;]   { printf("\\nPrintf valid\\n");  
return LINE; }  
(scanf)[\\ ]*(\\( [\\ ] * \"(. * { sp } . *) + \" [\\ ] * \\(, { inp } *) + \\)\\) [\\ ] * [;]  
    { printf(\"%s\\n\",checkspecifier(yytext));return LINE;}
```

(break; continue;)	{printf("KEYWORD
VERIFIED\n");return LINE;}	
(strcmp)(({var}\,{var}\))[;]	{printf("strcmp valid\n"); return
LINE;}	
(strcmp)(({var}\,("{alp}*{num}*{special})**\")[;]	{printf("STRCMP
valid\n");return LINE;}	
(strcmp)((\"({alp}*{num}*{special})**\",{var}\))[;]	{printf(" strcmp
valid\n");return LINE;}	
[\\]\\{ }	{return yytext[0];}
(\n t)	{return *yytext;}
.	{return 0;}

%%

```

char* checkspecifier(char *a){
    int i=0;
    int countspecifier=0;
    int equispecifier=0;
    while(a[i]!='\0'){
        if(a[i]==""){
            i++;
            while(a[i]!=''){
                if(a[i]=='%'&&(a[i+1]=='d'||a[i+1]=='f'||a[i+1]=='c')){
                    countspecifier+=1;
                }
                i++;
            }
        }
        while(a[i]==','){
            equispecifier+=1;
            i++;
        }
    }
}

```

```

        while(a[i]!=' ' && a[i]!='\n') i++;
    }
    i++;

}

if(equispecifier==countspecifier){
    return "Valid Function";
}

return "Missing specifier/variable";
}

```

```

int yywrap(){
    return 0;
}

```

EX9.y

```

%{
    #include <stdio.h>
    #include<stdlib.h>
    extern FILE *yyin;
    int yylex();
    int yyerror(char*);

%}

%token HEAD
%token MAIN
%token LINE

```

%%

S : A

;

A : B C F {printf("\nFile Scanned\n");}

;

B : HEAD Z B {printf("\nRecognized Header File\n");}

| HEAD Z

;

C : MAIN D {printf("\nRecognized Function Main \n");}

| MAIN '\n' D

;

D : '{' Z E

;

E : LINE Z E

|

LINE Z

;

F : '}' {printf("\nEnd of Code\n");}

;

Z : '\n' Z

| '\t' Z

| ' ' Z

|

;

%%

void main() {

```
FILE *fp;

fp=fopen("input.txt","r");
yyin=fp;
yyparse();

}

int yyerror(char *msg) {
    return fprintf (stderr, "YACC: %s\n", msg);

}
```

input.txt

```
#include<stdio.h>
#include<stdlib.h>
void main(){
char a;
scanf("%d %c",&a,&s);
break;
float t;
printf("CIT college");
strcmp(name,"hello");
}
```

OUTPUT:

```
C:\Users\RISHI\OneDrive\Desktop\Y>yacc -d EX9.y
C:\Users\RISHI\OneDrive\Desktop\Y>lex EX9.l
C:\Users\RISHI\OneDrive\Desktop\Y>gcc -g lex.yy.c EX9.tab.c
C:\Users\RISHI\OneDrive\Desktop\Y>a.exe

Recognized Header File

Valid Variable char a;
Valid Function
KEYWORD VERIFIED

Valid Variable float t;

Printf valid
STRCMP valid

Recognized Function Main

End of Code

File Scanned
```

RESULT:

Hence the program has been executed successfully.