RAMANUJAN COLLEGE
UNIVERSITY OF DELHI

SYSTEM PROGRAMMING
PRACTICAL FILE

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EXAM ROLL NUMBER: 20020570001

COURSE: BSc(H) Computer Science

SEMESTER: 5

PRACTICALS

1. Write a Lex program to count the number of lines and characters in the input file

2. Write a Lex program that implements the Caesar cipher: it replaces every letter with the one three letters after in in alphabetical order, wrapping around at Z. e.g., a is replaced by d, b bye, and so on z by c.

3. Write a Lex program that finds the longest word (defined as a contiguous string of upper- and lower-case letters) in the input.

4. Write a Lex program that distinguishes keywords, integers, floats, identifiers, operators, and comments in any simple programming language.

5. Write a Lex program to count the number of identifiers in a C file.

6. Write a Lex program to count the number of words, characters, blank spaces and lines in a C file.

7. Write a Lex specification program that generates a C program which takes a string “abcd” and prints the following output. abcd abc ab a

8. A program in Lex to recognize a valid arithmetic expression.

9.Write a YACC program to find the validity of a given expression (for operators + - * and /)

10. A Program in YACC which recognizes a valid variable which starts with letter followed by a digit. The letter should be in lowercase only.

11. A Program in YACC to evaluate an expression (simple calculator program for addition and subtraction, multiplication, division).

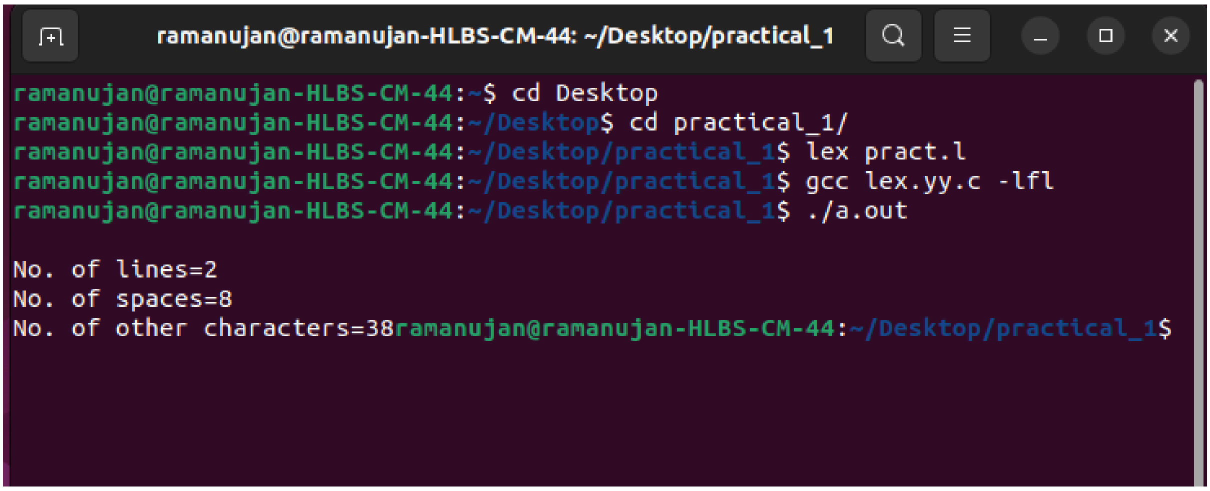
12. Program in YACC to recognize the strings “ab”, “aabb”,” aaabbb” … of the language ($a\ n\ b\ n$, n>=1).

13. Program in YACC to recognize the language ($a\ nb$, n>=10). (Output to say input is valid or not)

QUESTION 1

```
%{
        #include<stdio.h>
        int lc=0, sc=0, tc=0, ch=0; /*Global variables*/
        %}

        /*Rule Section*/
        %%
        \n lc++; //line counter
        ([ ])+ sc++; //space counter
        \t tc++; //tab counter
        . ch++; //characters counter
        %%

        int main()
        {
                // The function that starts the analysis
                yyin=fopen("abc.txt","r");
                yylex();

                printf("\nNo. of lines=%d", lc);
                printf("\nNo. of spaces=%d", sc);

                printf("\nNo. of other characters=%d", ch);

        }
```

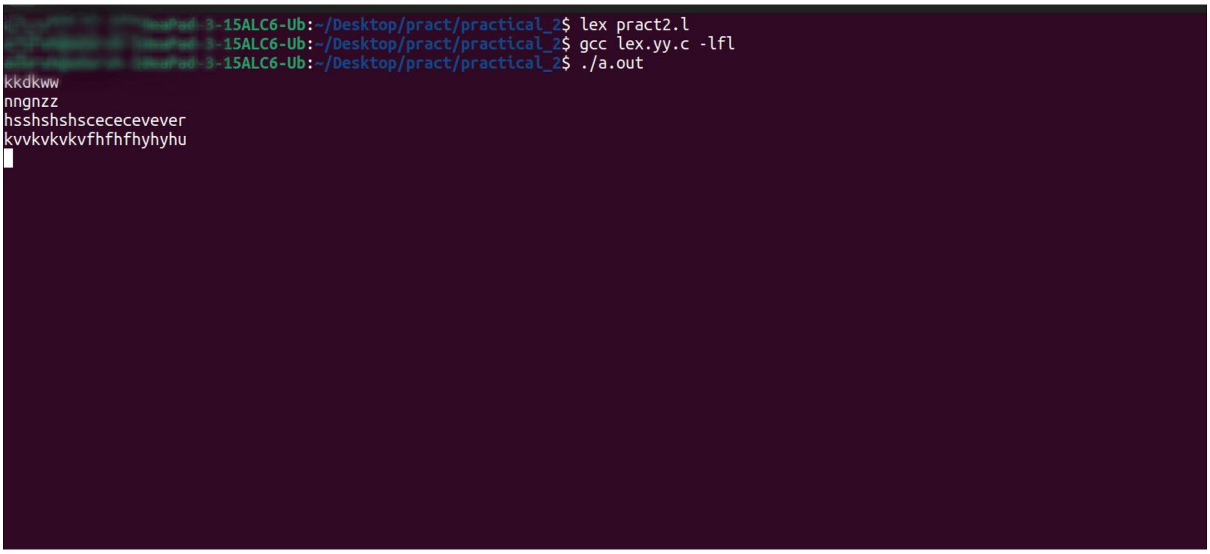
OUTPUT:



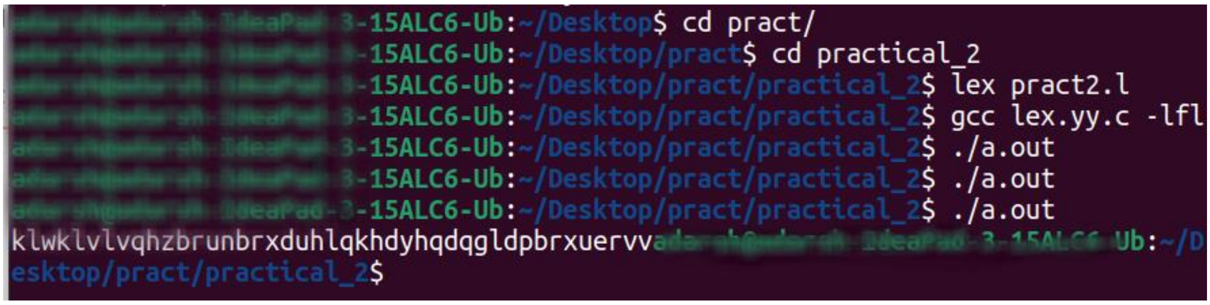
```
ramanujan@ramanujan-HLBS-CM-44:~$ cd Desktop
ramanujan@ramanujan-HLBS-CM-44:~/Desktop$ cd practical_1/
ramanujan@ramanujan-HLBS-CM-44:~/Desktop/practical_1$ lex pract.l
ramanujan@ramanujan-HLBS-CM-44:~/Desktop/practical_1$ gcc lex.yy.c -lfl
ramanujan@ramanujan-HLBS-CM-44:~/Desktop/practical_1$ ./a.out

No. of lines=2
No. of spaces=8
No. of other characters=38ramanujan@ramanujan-HLBS-CM-44:~/Desktop/practical_1$
```

QUESTION 2:

```
 %{

        %}
        %%
        [A-Wa-w] {printf("%c",yytext[0]+3);}
        [X-Zx-z] {printf("%c",yytext[0]-23);}
        %%
        int main()
        {
        //yyin=fopen("bbc.txt","r");
        //yyout=fopen("kbc.txt","w");
        yylex();

        }
```



```
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ lex pract2.l
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ gcc lex.yy.c -lfl
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ ./a.out
kkdkww
nngnzz
hsshshshscececevever
kvvkvkvkvfhfhfhyhyhu
```

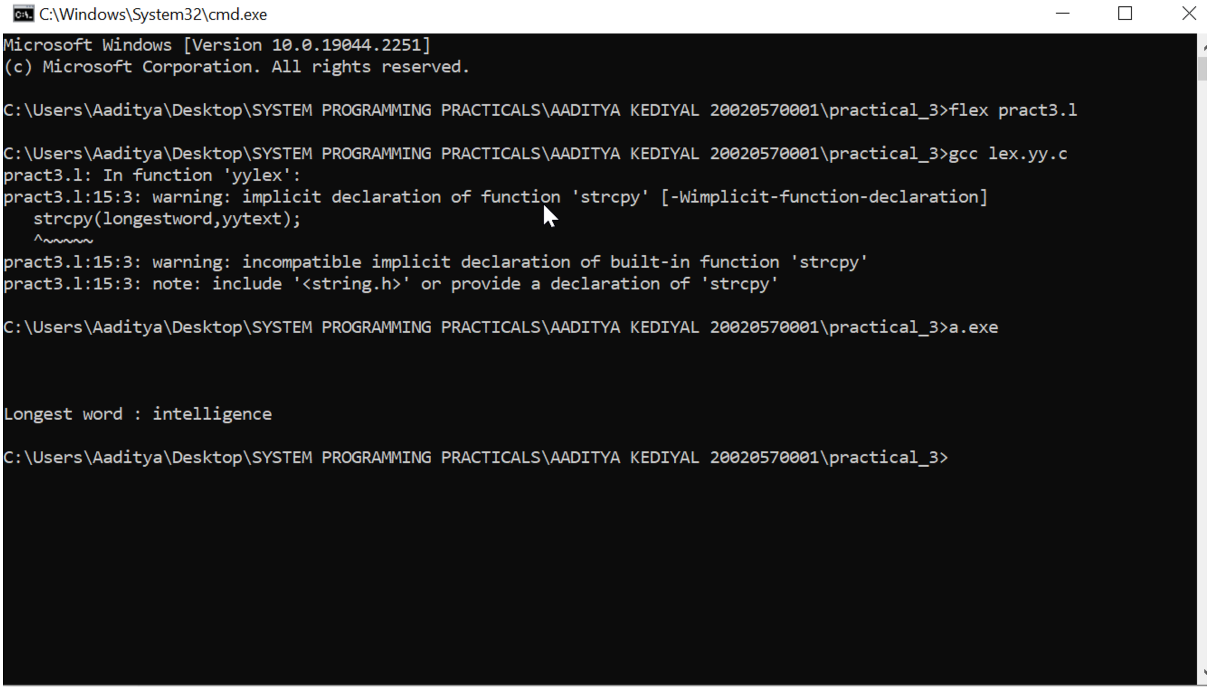


```
[redacted]-15ALC6-Ub:~/Desktop$ cd pract/
[redacted]-15ALC6-Ub:~/Desktop/pract$ cd practical_2
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ lex pract2.l
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ gcc lex.yy.c -lfl
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ ./a.out
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ ./a.out
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_2$ ./a.out
klwklvlvqhzbrunbrxduhlqkhdyhqdqgldpbrxuervv[redacted]-15ALC6-Ub:~/D
esktop/pract/practical_2$
```

QUESTION 3:

```
%{
        #include<stdio.h>
        #include<strings.h>
        // initialising length
        int length=0;
        // char array for storing longest word
        char longestword[50];
        %}

        %%
        [A-Za-z0-9]+ { if (yyleng > length) {

                       length=yyleng;
                // strcpy function to copy current word in yytxt in longest
                       strcpy(longestword,yytext);
                       }
               }
        "." return 1;
        %%
        int main()
        {
        yyin=fopen("tbc.txt","r");

        yylex();
        printf("Longest word : %s\n",longestword);
        //printf("Length of Longest word : %s\n",length);

        return 0;
        }
        int yywrap(){
            return 1;
        }
```

OUTPUT:

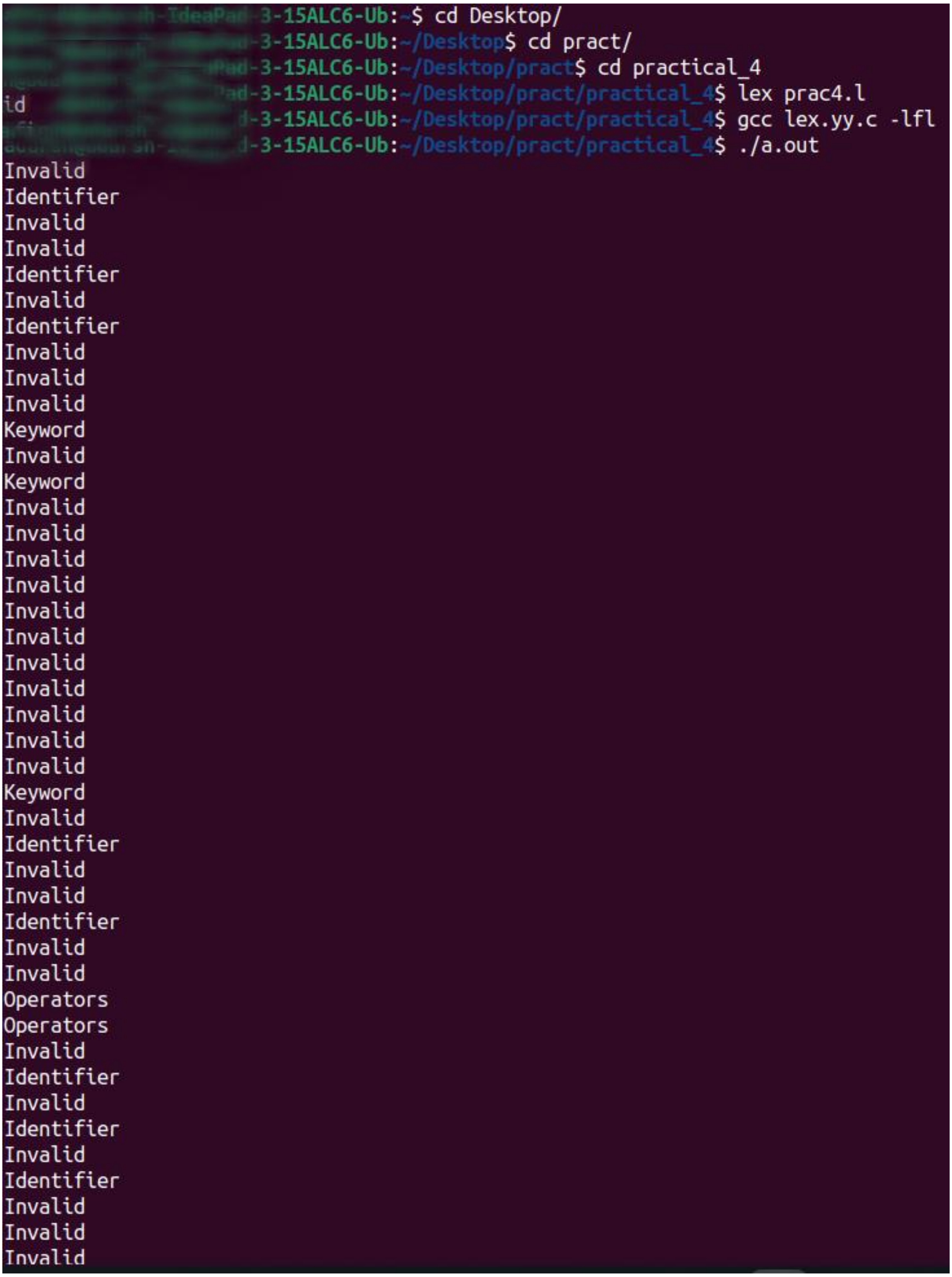


```
Microsoft Windows [Version 10.0.19044.2251]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Aaditya\Desktop\SYSTEM PROGRAMMING PRACTICALS\AADITYA KEDIYAL 20020570001\practical_3>flex pract3.l

C:\Users\Aaditya\Desktop\SYSTEM PROGRAMMING PRACTICALS\AADITYA KEDIYAL 20020570001\practical_3>gcc lex.yy.c
pract3.l: In function 'yylex':
pract3.l:15:3: warning: implicit declaration of function 'strcpy' [-Wimplicit-function-declaration]
   strcpy(longestword,yytext);
   ^~~~~~
pract3.l:15:3: warning: incompatible implicit declaration of built-in function 'strcpy'
pract3.l:15:3: note: include '<string.h>' or provide a declaration of 'strcpy'

C:\Users\Aaditya\Desktop\SYSTEM PROGRAMMING PRACTICALS\AADITYA KEDIYAL 20020570001\practical_3>a.exe



Longest word : intelligence

C:\Users\Aaditya\Desktop\SYSTEM PROGRAMMING PRACTICALS\AADITYA KEDIYAL 20020570001\practical_3>
```

QUESTION 4:

```
 %{


        %}
        %%
        [0-9]* {printf("Integer\n");}
        [0-9]+\.[0-9]+ {printf("Float\n"); }
        int|float|if|else|printf|main|exit|switch {printf("Keyword\n");}
        [+|*|/|%|&] {printf("Operators\n");}
        "-" {printf("Operators\n");}
        "/*".*"*/" {printf("comment\n");}
        [_a-zA-Z][_a-zA-Z0-9]{0,30} {printf("Identifier\n");}
        . {printf("Invalid\n");}
        %%
        int main()
        {
        yyin=fopen("code.c","r");
        yyout=fopen("kmd.txt","w");
        yylex();

        }
```

OUTPUT:

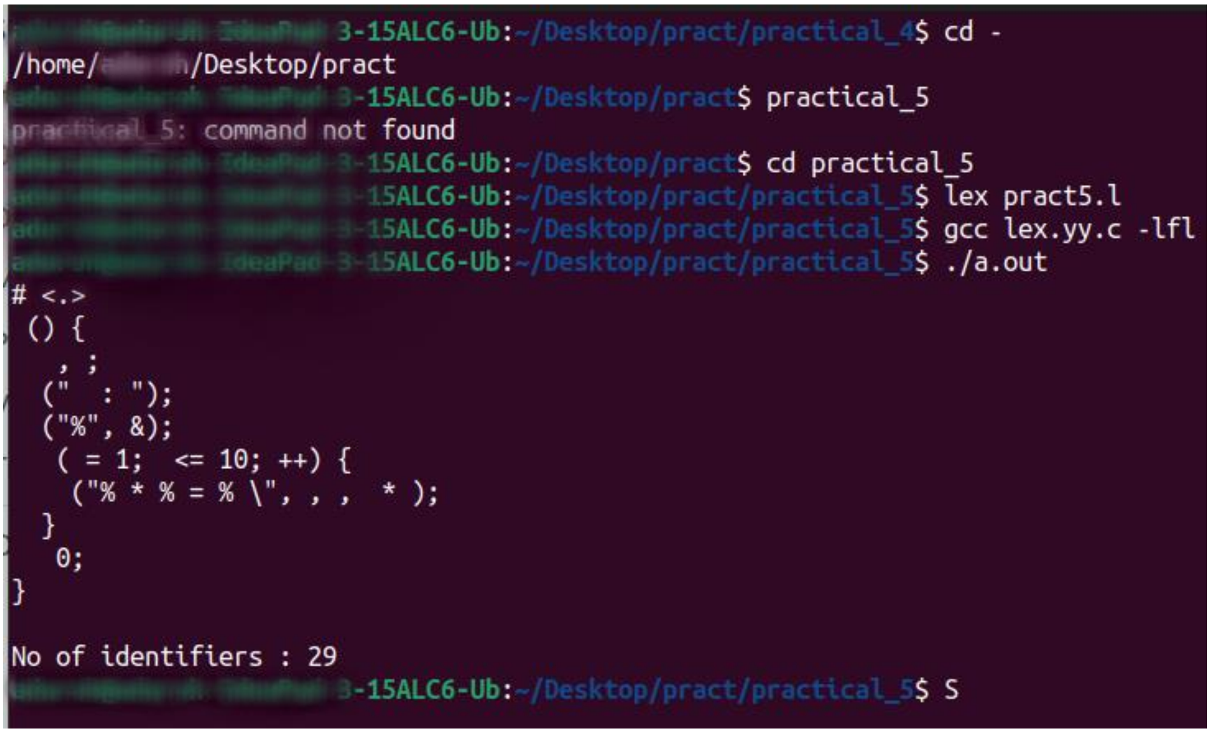


```
[redacted]-3-15ALC6-Ub:~$ cd Desktop/
-3-15ALC6-Ub:~/Desktop$ cd pract/
-3-15ALC6-Ub:~/Desktop/pract$ cd practical_4
-3-15ALC6-Ub:~/Desktop/pract/practical_4$ lex prac4.l
-3-15ALC6-Ub:~/Desktop/pract/practical_4$ gcc lex.yy.c -lfl
-3-15ALC6-Ub:~/Desktop/pract/practical_4$ ./a.out
Invalid
Identifier
Invalid
Invalid
Identifier
Invalid
Identifier
Invalid
Invalid
Invalid
Keyword
Invalid
Keyword
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Invalid
Keyword
Invalid
Identifier
Invalid
Invalid
Identifier
Invalid
Invalid
Operators
Operators
Invalid
Identifier
Invalid
Identifier
Invalid
Identifier
Invalid
Invalid
Invalid
```

QUESTION 5:

```
%{
        #include<stdio.h>
        int word=0,character=0,space=0,lines=0;
        %}
        %%
        [A-Za-z|0-9]+ {word++;character=character+strlen(yytext);}
        . {character++;}
        \n {lines++;character++;}
        [ \n\t\r]+ {space++;}
        %%
        int main(int agrc,char **argv)
        {
        yyin=fopen("pla.txt","r");
        yylex();
        printf("word : %d\n",word);
        printf("characters : %d\n",character);
        printf("lines : %d\n",lines);
        printf("spaces : %d\n",space);
        }
```

OUTPUT:

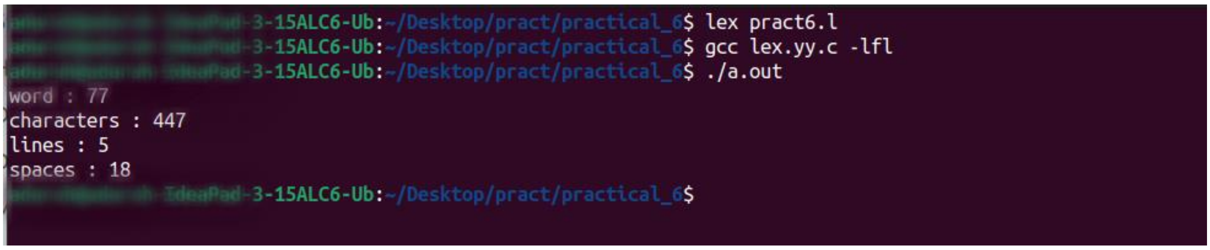


```
[redacted] 3-15ALC6-Ub:~/Desktop/pract/practical_4$ cd -
/home/[redacted]/Desktop/pract
[redacted]3-15ALC6-Ub:~/Desktop/pract$ practical_5
[redacted]_5: command not found
[redacted]-15ALC6-Ub:~/Desktop/pract$ cd practical_5
[redacted]15ALC6-Ub:~/Desktop/pract/practical_5$ lex pract5.l
[redacted]15ALC6-Ub:~/Desktop/pract/practical_5$ gcc lex.yy.c -lfl
[redacted]15ALC6-Ub:~/Desktop/pract/practical_5$ ./a.out
# <.>
 () {
   , ;
  ("  : ");
  ("%", &);
   ( = 1;  <= 10; ++) {
    ("% * % = % \", , ,  * );
  }
   0;
}

No of identifiers : 29
[redacted] 3-15ALC6-Ub:~/Desktop/pract/practical_5$ S
```

QUESTION 6:

```
%{
        #include<stdio.h>
        int word=0,character=0,space=0,lines=0;
        %}
        %%
        [A-Za-z|0-9]+ {word++;character=character+strlen(yytext);}
        . {character++;}
        \n {lines++;character++;}
        [ \n\t\r]+ {space++;}
        %%
        int main(int agrc,char **argv)
        {
        yyin=fopen("pla.txt","r");
        yylex();
        printf("word : %d\n",word);
        printf("characters : %d\n",character);
        printf("lines : %d\n",lines);
        printf("spaces : %d\n",space);
        }
```

OUTPUT:

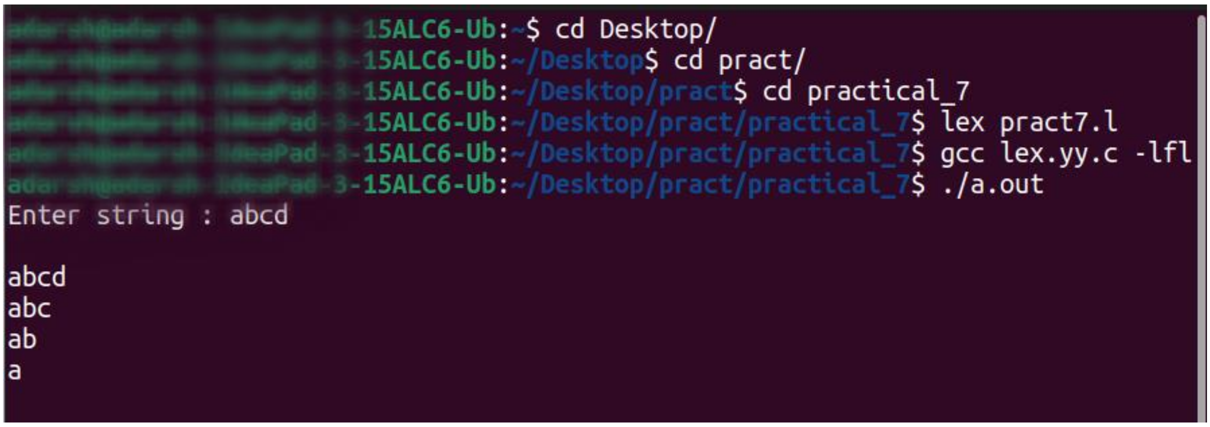


```
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_6$ lex pract6.l
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_6$ gcc lex.yy.c -lfl
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_6$ ./a.out
word : 77
characters : 447
lines : 5
spaces : 18
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_6$
```

QUESTION 7:

```
%{
        %}
        %%
        [A-Za-z]+ {int len=yyleng;
                   int i=len;
                   printf("\n");
                   while(i>=0)
                   {
                     int j=0;
                     while(j<i)
                     {
                       printf("%c",yytext[j]);
                       j++;
                     }
                     printf("\n");
                     i--;
                   }
                  }
        %%
        int main()
        {
        printf("Enter string : ");
        yylex();
        }
```

OUTPUT:

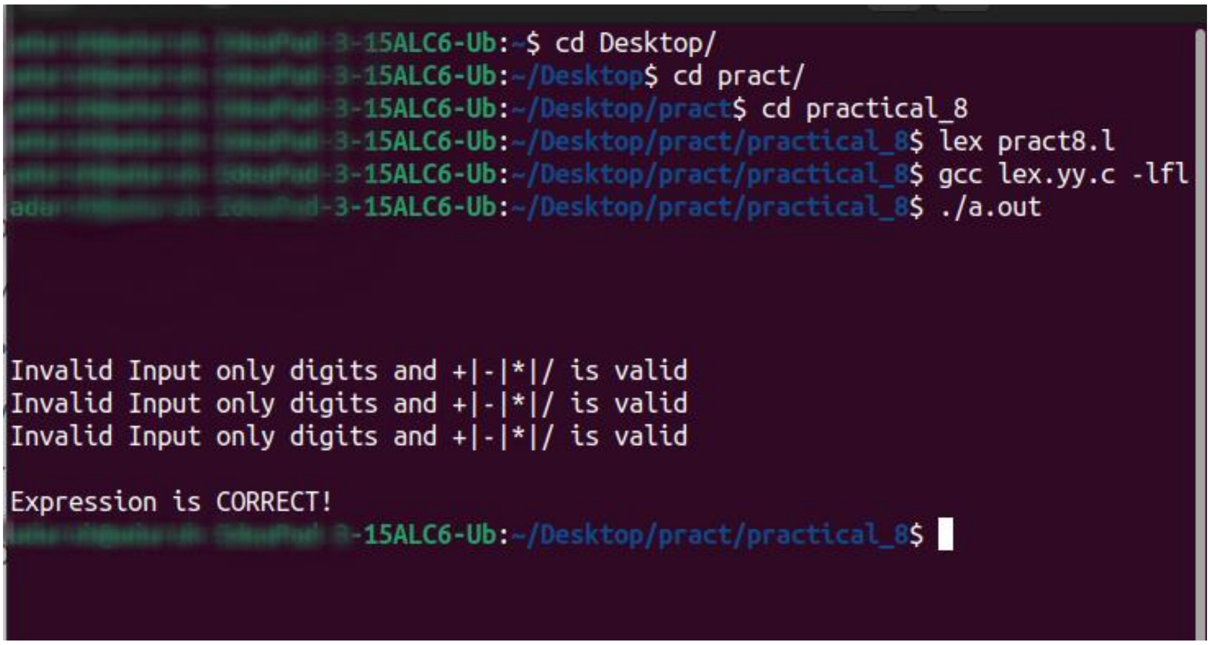


```
[redacted]15ALC6-Ub:~$ cd Desktop/
[redacted]15ALC6-Ub:~/Desktop$ cd pract/
[redacted]15ALC6-Ub:~/Desktop/pract$ cd practical_7
[redacted]15ALC6-Ub:~/Desktop/pract/practical_7$ lex pract7.l
[redacted]15ALC6-Ub:~/Desktop/pract/practical_7$ gcc lex.yy.c -lfl
[redacted]15ALC6-Ub:~/Desktop/pract/practical_7$ ./a.out
Enter string : abcd

abcd
abc
ab
a
```

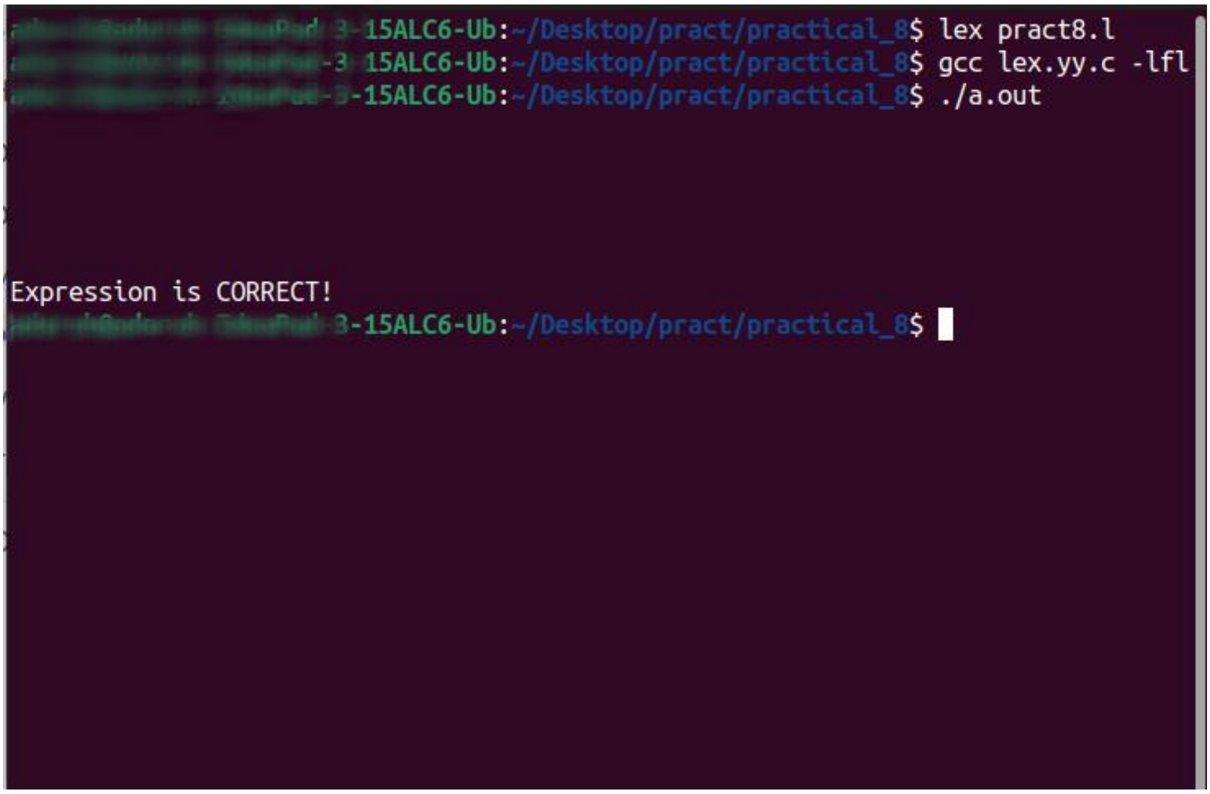
QUESTION 8:

```
%{
        #include<strings.h>
        int opcount=0,intcount=0,check=1,top=0;
        %}
        %%
        ['('] {check=0;}
        [')'] {check=1;}
        [+|*|/|-] {opcount++;}
        [0-9]+ {intcount++;}
        . {printf("Invalid Input only digits and +|-|*|/ is valid\n");}
        %%
        int main()
        {

        yyin=fopen("abd.txt","r");
        yylex();
        if(intcount=opcount+1)
        {
         if(check==1)
         {
            printf("Expression is CORRECT!\n");
         }
         else{
            printf("')' bracket missing from expression\n");
         }
        }
        else{
           printf("Expression is INCORRECT!\n");
        }
        }
```

OUTPUT:



```
[redacted]3-15ALC6-Ub:~$ cd Desktop/
[redacted]3-15ALC6-Ub:~/Desktop$ cd pract/
[redacted]3-15ALC6-Ub:~/Desktop/pract$ cd practical_8
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ lex pract8.l
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ gcc lex.yy.c -lfl
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ ./a.out




Invalid Input only digits and +|-|*|/ is valid
Invalid Input only digits and +|-|*|/ is valid
Invalid Input only digits and +|-|*|/ is valid

Expression is CORRECT!
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ 
```



```
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ lex pract8.l
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ gcc lex.yy.c -lfl
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ ./a.out





Expression is CORRECT!
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_8$ 
```

QUESTION 9:

Lex program:

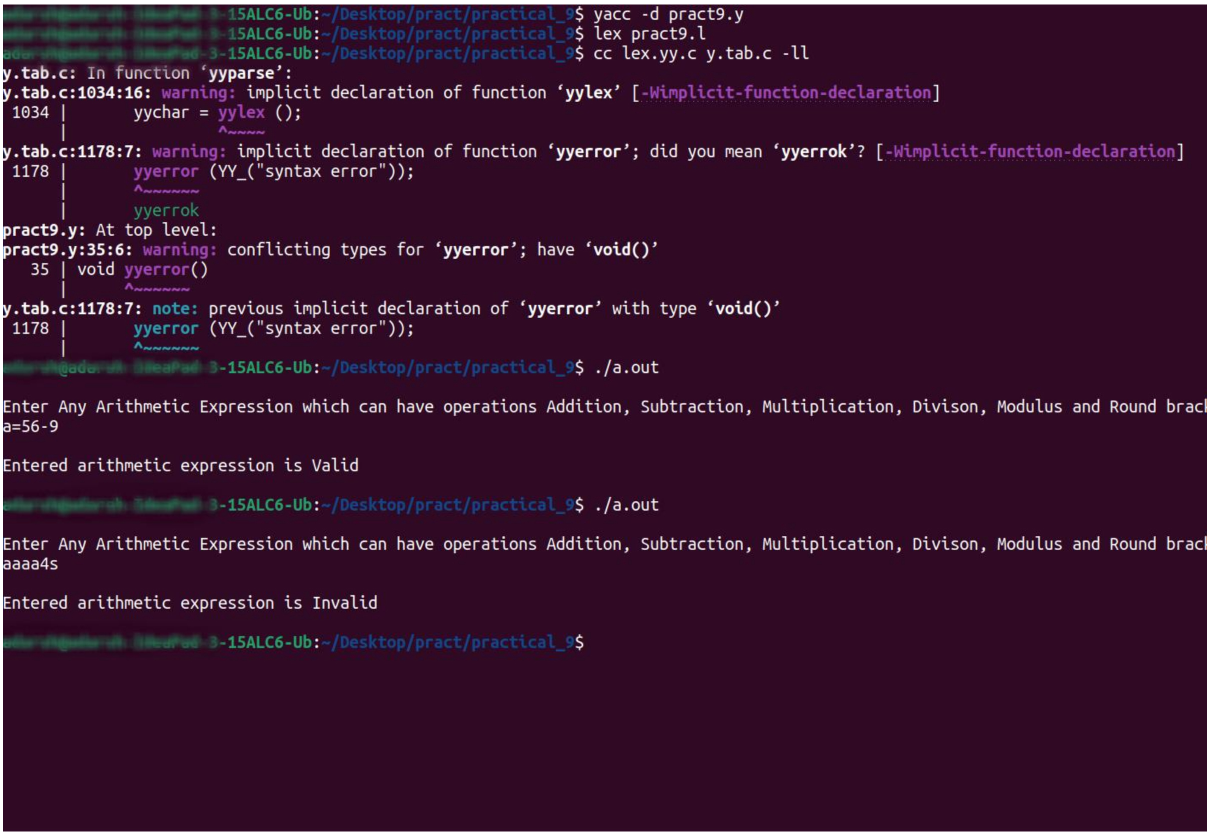
```
%{
        #include<stdio.h>
        #include "y.tab.h"
        %}

        %%
        [a-zA-Z]+ return VARIABLE;
        [0-9]+ return NUMBER;
        [\t] ;
        [\n] return 0;
        . return yytext[0];
        %%
        int yywrap()
        {
        return 1;
        }
```

Yacc program:

```
%{
            #include<stdio.h>
        %}
        %token NUMBER
        %token VARIABLE

        %left '+' '-'
        %left '*' '/' '%'
        %left '(' ')'

        %%

        S: VARIABLE'='E {
               printf("\nEntered arithmetic expression is Valid\n\n");
               return 0;
             }
        E:E'+'E
         |E'-'E
         |E'*'E
         |E'/'E
         |E'%'E
```

```
 |'('E')'
 | NUMBER
 | VARIABLE
;

%%

void main()
{
   printf("\nEnter Any Arithmetic Expression which can have operations Addition,
Subtraction, Multiplication, Divison, Modulus and Round brackets:\n");
   yyparse();
}

void yyerror()
{
   printf("\nEntered arithmetic expression is Invalid\n\n");

}
```

OUTPUT:



```
[redacted]15ALC6-Ub:~/Desktop/pract/practical_9$ yacc -d pract9.y
[redacted]15ALC6-Ub:~/Desktop/pract/practical_9$ lex pract9.l
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_9$ cc lex.yy.c y.tab.c -ll
y.tab.c: In function ‘yyparse’:
y.tab.c:1034:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1034 |       yychar = yylex ();
      |                ^~~~~
y.tab.c:1178:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1178 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
pract9.y: At top level:
pract9.y:35:6: warning: conflicting types for ‘yyerror’; have ‘void()’
   35 | void yyerror()
      |      ^~~~~~~
y.tab.c:1178:7: note: previous implicit declaration of ‘yyerror’ with type ‘void()’
 1178 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_9$ ./a.out

Enter Any Arithmetic Expression which can have operations Addition, Subtraction, Multiplication, Divison, Modulus and Round brac
a=56-9

Entered arithmetic expression is Valid

[redacted]-15ALC6-Ub:~/Desktop/pract/practical_9$ ./a.out

Enter Any Arithmetic Expression which can have operations Addition, Subtraction, Multiplication, Divison, Modulus and Round brac
aaaa4s

Entered arithmetic expression is Invalid

[redacted]-15ALC6-Ub:~/Desktop/pract/practical_9$
```

QUESTION 10:

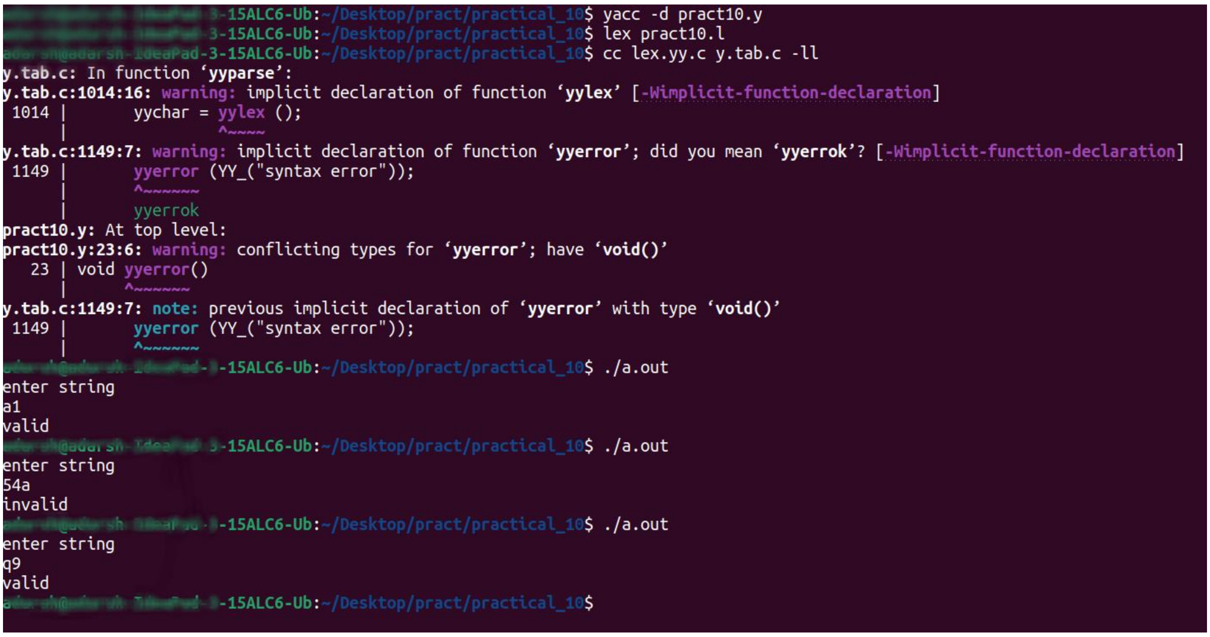
Lex program:

```
%{
        #include "y.tab.h"
        %}
        %%
        [0-9]+ {return DIGIT;}
        [a-z]+ {return LETTER;}
        [ \t] {;}
        \n { return 0;}
        . {return yytext[0];}
        %%
```

Yacc program:

```
%{
        #include<stdio.h>
        #include<stdlib.h>
        %}
        %token DIGIT LETTER
        %%
        stmt:A
             ;
        A: LETTER B
         ;
        B: LETTER B
         | DIGIT B
         | LETTER
         | DIGIT
         ;
        %%
        void main(){
        printf("enter string \n");
        yyparse();
        printf("valid \n");
        exit(0);
        }
        void yyerror()
        {
        printf("invalid \n");
        exit(0);
        }
```

OUTPUT:



```
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ yacc -d pract10.y
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ lex pract10.l
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ cc lex.yy.c y.tab.c -ll
y.tab.c: In function ‘yyparse’:
y.tab.c:1014:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1014 |       yychar = yylex ();
      |                ^~~~~
y.tab.c:1149:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1149 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
pract10.y: At top level:
pract10.y:23:6: warning: conflicting types for ‘yyerror’; have ‘void()’
   23 | void yyerror()
      |      ^~~~~~~
y.tab.c:1149:7: note: previous implicit declaration of ‘yyerror’ with type ‘void()’
 1149 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ ./a.out
enter string
a1
valid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ ./a.out
enter string
54a
invalid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$ ./a.out
enter string
q9
valid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_10$
```

QUESTION 11:

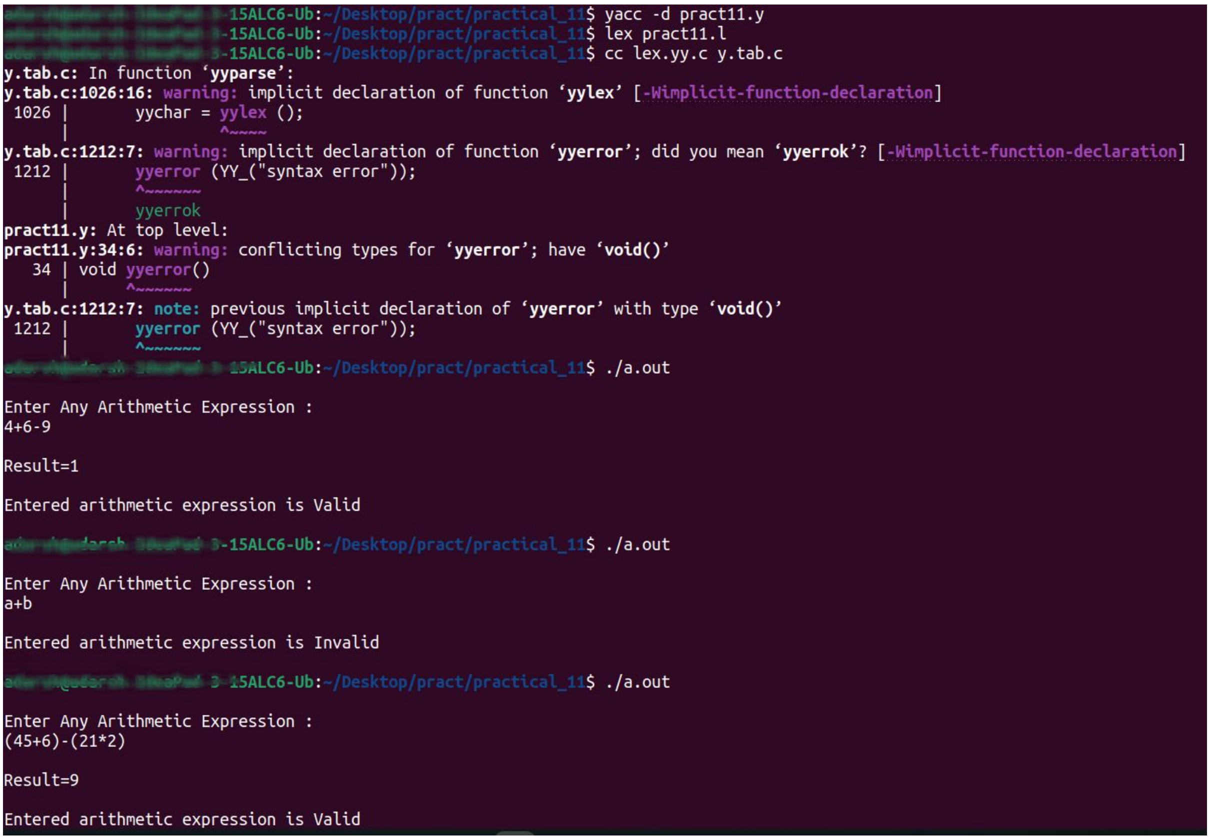
Lex program:

```
%{
        #include<stdio.h>
        #include "y.tab.h"
        extern int yylval;
        %}

        %%
        [0-9]+ {
                  yylval=atoi(yytext);
                  return NUMBER;
               }
        [\t] ;
        [\n] return 0;
        . return yytext[0];
        %%
        int yywrap()
        {
        return 1;
        }
```

Yaac program:

```
%{
            #include<stdio.h>
            int flag=0;

        %}
        %token NUMBER

        %left '+' '-'
        %left '*' '/' '%'
        %left '(' ')'
        %%
        ArithmeticExpression: E{
                 printf("\nResult=%d\n",$$);
                 return 0;
                }
        E:E'+'E {$$=$1+$3;}
         |E'-'E {$$=$1-$3;}
         |E'*'E {$$=$1*$3;}
         |E'/'E {$$=$1/$3;}
         |E'%'E {$$=$1%$3;}
         |'('E')' {$$=$2;}
         | NUMBER {$$=$1;}
        ;
        %%

        void main()
        {
           printf("\nEnter Any Arithmetic Expression :\n");
           yyparse();
          if(flag==0)
           printf("\nEntered arithmetic expression is Valid\n\n");

        }
        void yyerror()
        {
           printf("\nEntered arithmetic expression is Invalid\n\n");
           flag=1;
        }
```

OUTPUT:



```
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ yacc -d pract11.y
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ lex pract11.l
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ cc lex.yy.c y.tab.c
y.tab.c: In function ‘yyparse’:
y.tab.c:1026:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1026 |       yychar = yylex ();
      |                ^~~~~
y.tab.c:1212:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1212 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
pract11.y: At top level:
pract11.y:34:6: warning: conflicting types for ‘yyerror’; have ‘void()’
   34 | void yyerror()
      |      ^~~~~~~
y.tab.c:1212:7: note: previous implicit declaration of ‘yyerror’ with type ‘void()’
 1212 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out

Enter Any Arithmetic Expression :
4+6-9

Result=1

Entered arithmetic expression is Valid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out

Enter Any Arithmetic Expression :
a+b

Entered arithmetic expression is Invalid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out

Enter Any Arithmetic Expression :
(45+6)-(21*2)

Result=9

Entered arithmetic expression is Valid
```

QUESTION 12:

Lex program:

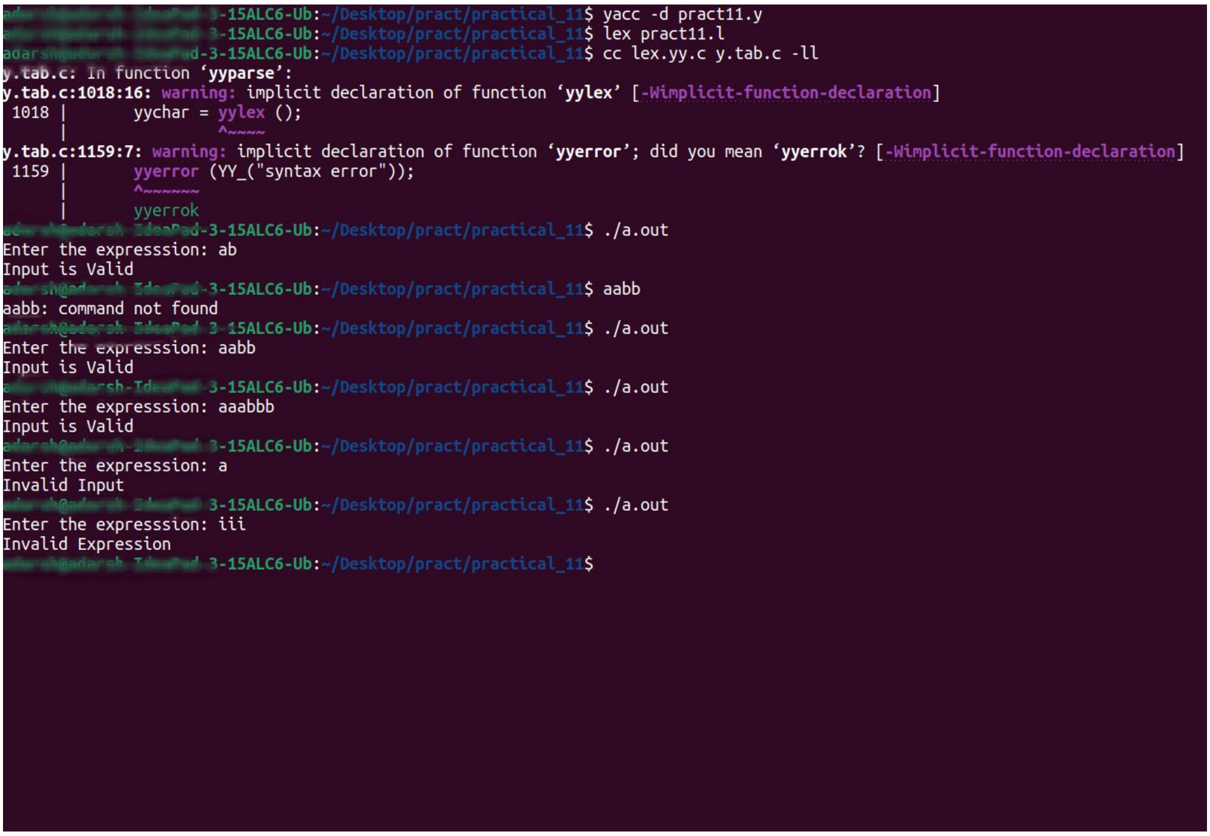
```
%{
        #include "y.tab.h"
        %}
        alpha [Aa]
        beta [Bb]
        newline [\n]
        %%
        {alpha} { return alpha ;}
        {beta} {return beta;}
        {newline} { return newline ;}
        . { printf("Invalid Expression\n");exit(0); }
        %%
```

Yaac program:

```
%{
        #include<stdio.h>
```

```
#include<stdlib.h>
#include<strings.h>
%}
%token alpha beta newline
%%
line : term newline {printf("Input is Valid\n"); exit(0);};
term: alpha term beta | ;
%%

int yyerror(char *msg)
{
printf("Invalid Input\n");
exit(0);
}

int main ()
{
printf("Enter the expresssion: ");
yyparse();
}
```

OUTPUT:



```
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ yacc -d pract11.y
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ lex pract11.l
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ cc lex.yy.c y.tab.c -ll
y.tab.c: In function ‘yyparse’:
y.tab.c:1018:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1018 |       yychar = yylex ();
      |                ^~~~~
y.tab.c:1159:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1159 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out
Enter the expresssion: ab
Input is Valid
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ aabb
aabb: command not found
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out
Enter the expresssion: aabb
Input is Valid
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out
Enter the expresssion: aaabbb
Input is Valid
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out
Enter the expresssion: a
Invalid Input
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$ ./a.out
Enter the expresssion: iii
Invalid Expression
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_11$
```

QUESTION 13:

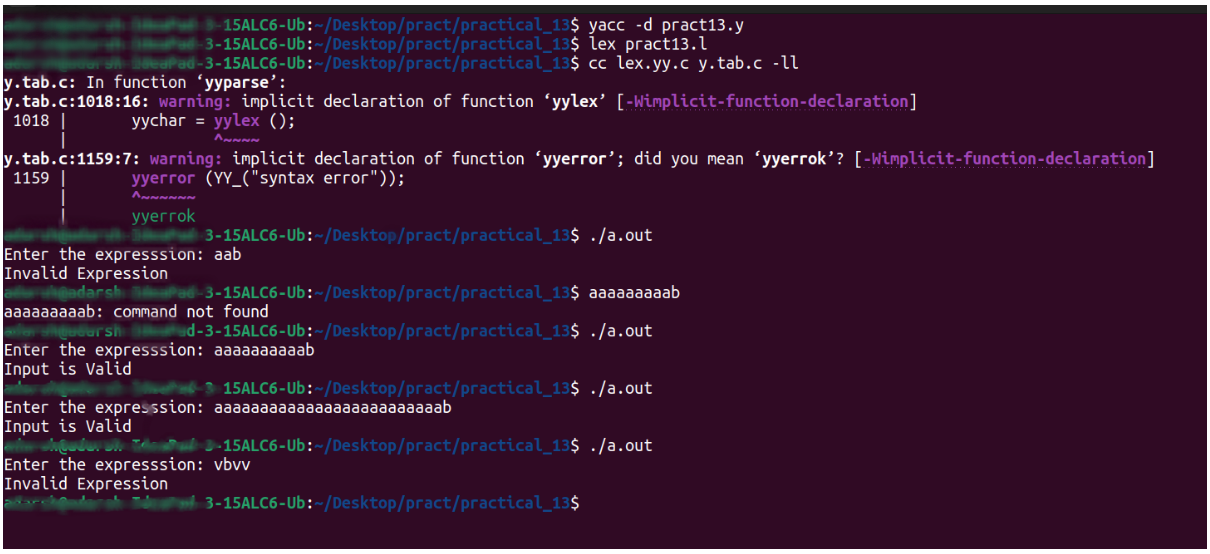
Lex program:

```
%{
        #include "y.tab.h"
        %}
        alpha [a]{10,}
        beta [b]
        newline [\n]
        %%
        {alpha} { return alpha ;}
        {beta} {return beta;}
        {newline} { return newline ;}
        . { printf("Invalid Expression\n");exit(0); }
        %%
```

Yaac program:

```
%{
        #include<stdio.h>
        #include<stdlib.h>
        #include<strings.h>
        %}
        %token alpha beta newline
        %%
        line : term beta newline {printf("Input is Valid\n"); exit(0);};
        term: alpha term |;
        %%

        int yyerror(char *msg)
        {
        printf("Invalid Input\n");
        exit(0);
        }

        int main ()
        {
        printf("Enter the expresssion: ");
        yyparse();
        }
```

OUTPUT:



```
[redacted]15ALC6-Ub:~/Desktop/pract/practical_13$ yacc -d pract13.y
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_13$ lex pract13.l
[redacted]-3-15ALC6-Ub:~/Desktop/pract/practical_13$ cc lex.yy.c y.tab.c -ll
y.tab.c: In function ‘yyparse’:
y.tab.c:1018:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1018 |       yychar = yylex ();
      |                ^~~~~
y.tab.c:1159:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1159 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_13$ ./a.out
Enter the expresssion: aab
Invalid Expression
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_13$ aaaaaaaaab
aaaaaaaaab: command not found
[redacted]d-3-15ALC6-Ub:~/Desktop/pract/practical_13$ ./a.out
Enter the expresssion: aaaaaaaaaab
Input is Valid
[redacted]15ALC6-Ub:~/Desktop/pract/practical_13$ ./a.out
Enter the expresssion: aaaaaaaaaaaaaaaaaaaaaaaaab
Input is Valid
[redacted]-15ALC6-Ub:~/Desktop/pract/practical_13$ ./a.out
Enter the expresssion: vbvv
Invalid Expression
[redacted]3-15ALC6-Ub:~/Desktop/pract/practical_13$
```