CSE 358 Assignment 4

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Question 1

LEX is a lexical analyzer generator used in compiler construction. It converts a set of regular expressions into a finite state machine to recognize patterns in input text, producing tokens for further processing by a process.

Structure of LEX program:

A LEX program consist of 3 sections:

1) Definition section: Defines macros and header files.
2) Rules section: Contains pattern-action pairs where regular expressions define patterns and actions specify corresponding code.
3) User code section: Includes additional C code usually for functions needed in actions.

The LEX tool generates a C program (lex.yy.c), which when compiled produces a lexical analyser (a.out) to process input text.

Question 2

Code:

q2.l

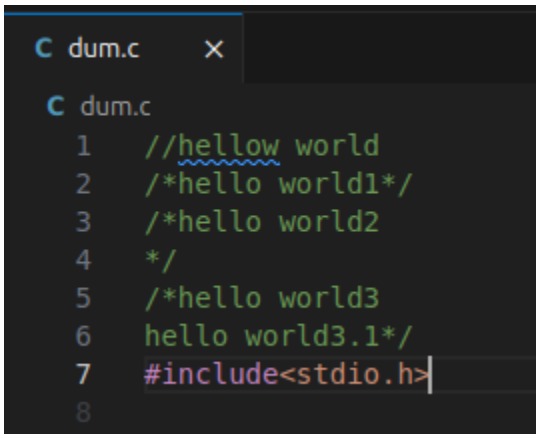
```
/*lex program to count number of words*/
%{
#include<stdio.h>
#include<string.h>
int i = 0;
%}

/* Rules Section*/
%%
([a-zA-Z0-9])* {i++;} /* Rule for counting number of words*/

"\n" {printf("%d\n", i); i = 0;}
%%

int yywrap(void){}

int main()
{
    // The function that starts the analysis
    yylex();

    return 0;
}


// commands:
// lex -o q2.c q2.l
// gcc q2.c -ll -o q2
// ./q2
```

Result:


PROBLEMS 2
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
POLYGLOT NOTEBOOK
GITLENS
SPELL CHECKER 2
COMMENTS
arnav@arnav-IdeaPad-Gaming-3-15ACH6:~/Desktop/Compiller-Techniques/LAB 4$ ./q2
hi im arnav
3
hello.im.arnav
..3

Question 3

File used for testing:



Code:

q3.l

```
%{
#include<stdio.h>
#include<stdlib.h>
int a=0,b=0,c=0,d;
%}
%x COMMENT
 /* an exclusive state that does not also match normal stuff */
%%
"//".*   {a++;}
"/*"     { BEGIN COMMENT; }
<COMMENT>"*/" {c++; BEGIN INITIAL; }
<COMMENT>.    ;
%%
void main(int argc,char *argv[]){
    yyin=fopen(argv[1],"r");
    yylex();
    printf("single line %d \nmultiline %d \n",a,c);
    d=a+c;
    printf("total %d \n",d);
}

// commands:
// lex -o q3.c q3.l
// gcc q3.c -ll -o q3
// ./q3 dum.c
```

Result:

```
PROBLEMS 4  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  POLYGLOT NOTEBOOK  GITLENS  SPELL CHECKER 4  COMMENTS
arnav@arnav-IdeaPad-Gaming-3-15ACH6:~/Desktop/Compiller-Techniques/LAB 4$ ./q3 dum.c
#include<stdio.h>
single line 1
multiline 3
total 4
arnav@arnav-IdeaPad-Gaming-3-15ACH6:~/Desktop/Compiller-Techniques/LAB 4$
```

For code refer GitHub

https://github.com/arnavjain2710/Compiller-Techniques/tree/main/LAB%204