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Assessment 2

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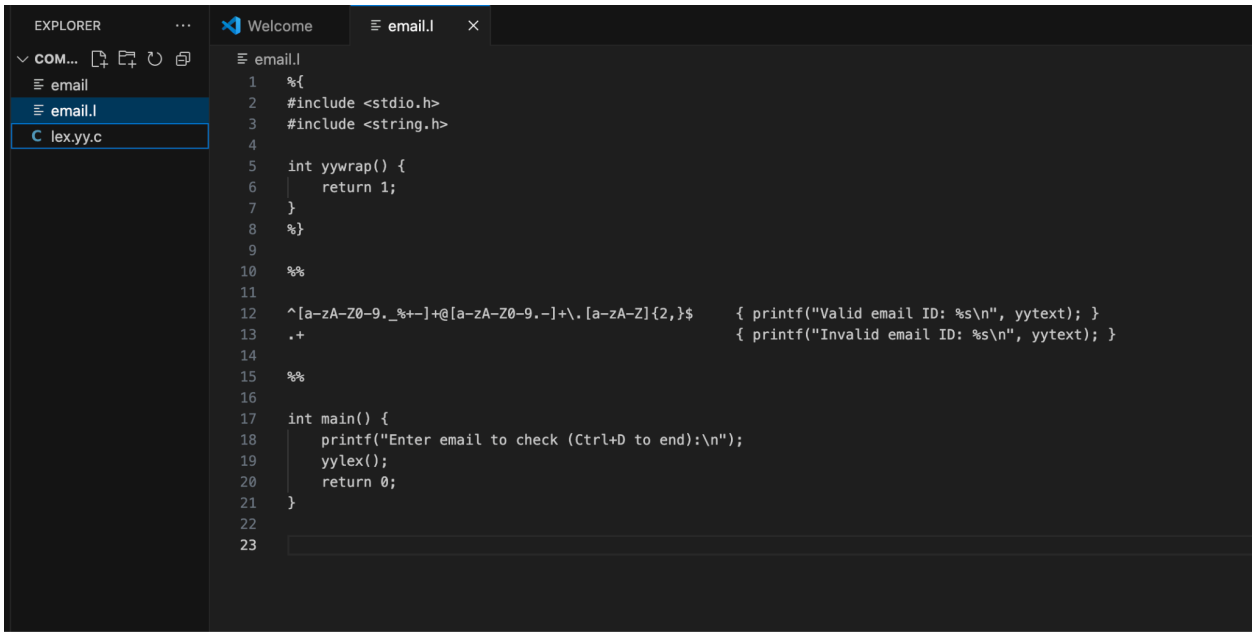
Lab Slot- L47 +L48

Q1. Write lex code to check valid email or not.

Code:

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

int yywrap() {
   return 1;
}
%}

%%

^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}$     { printf("Valid email ID: %s\n", yytext); }
.+                                                   { printf("Invalid email ID: %s\n", yytext); }

%%

int main() {
   printf("Enter email to check (Ctrl+D to end):\n");
```

```
    yylex();
    return 0;
}
```



Input & Output:
bhoomi@Bhoomis-MacBook-Air compiler % flex email.l
gcc lex.yy.c -o email -ll

bhoomi@Bhoomis-MacBook-Air compiler % ./email

Enter email to check (Ctrl+D to end):
bhoomi
Invalid email ID: bhoomi

bhoomi@gmail.com
Valid email ID: bhoomi@gmail.com

```
bhoomi@Bhoomis-MacBook-Air compiler % flex email.l

bhoomi@Bhoomis-MacBook-Air compiler % gcc lex.yy.c -o email -I/opt/homebrew/opt/
flex/include -L/opt/homebrew/opt/flex/lib -lfl

bhoomi@Bhoomis-MacBook-Air compiler % ./email

Enter email to check (Ctrl+D to end):
test@example.com
Valid email ID: test@example.com

^C
bhoomi@Bhoomis-MacBook-Air compiler % ./email

Enter email to check (Ctrl+D to end):
bad-em@
Invalid email ID: bad-em@
```

Q2. Write a lex code to check whether the mobile number is 10 digits.

Code:

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

int yywrap() {
    return 1;
}
%}

%%

^[6-9][0-9]{9}$      { printf("Valid mobile number: %s\n", yytext); }
[0-9]+               { printf("Invalid mobile number: %s\n", yytext); }
.|\n                 { /* Ignore other characters */ }

%%

int main() {
    printf("Enter mobile number to check (Ctrl+D to end):\n");
    yylex();
    return 0;
}
```

EXPLORER

COMPILER
- email
- email.l
- lex.yy.c
- mobile
- mobile.l

Welcome | email.l | mobile.l

mobile.l

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

int yywrap() {
    return 1;
}
%}

%%

^[6-9][0-9]{9}$      { printf("Valid mobile number: %s\n", yytext); }
[0-9]+               { printf("Invalid mobile number: %s\n", yytext); }
.|\n                 { /* Ignore other characters */ }

%%

int main() {
    printf("Enter mobile number to check (Ctrl+D to end):\n");
    yylex();
    return 0;
}
```

Input & Output:
bhoomi@Bhoomis-MacBook-Air compiler % flex mobile.l
gcc lex.yy.c -o mobile -ll

bhoomi@Bhoomis-MacBook-Air compiler % ./mobile

Enter mobile number to check (Ctrl+D to end):
6543212
Invalid mobile number: 6543212
9821346452
Valid mobile number: 9821346452
987654
Invalid mobile number: 987654

```
bhoomi@Bhoomis-MacBook-Air compiler % flex mobile.l

bhoomi@Bhoomis-MacBook-Air compiler % gcc lex.yy.c -o mobile -I/opt/homebrew/opt
/flex/include -L/opt/homebrew/opt/flex/lib -lfl

bhoomi@Bhoomis-MacBook-Air compiler % ./mobile

Enter mobile number to check (Ctrl+D to end):
9123548710
Valid mobile number: 9123548710
^C
bhoomi@Bhoomis-MacBook-Air compiler % ./mobile

Enter mobile number to check (Ctrl+D to end):
64257
Invalid mobile number: 64257
```

Q3. Write a lex code to check whether a URL is valid or not.

Code:

```
%option noyywrap

%{

   #include <stdio.h>

%}

url www\.[a-zA-Z0-9-]+(\.[a-zA-Z]{2,})+

%%

{url}     {printf("valid url");}

.+        {printf("invalid url");}

%%

int main()
```

```
{
    yylex();
    return 0;
}
```

Input & Output:

bhoomi@Bhoomis-MacBook-Air compiler % flex check.l

gcc lex.yy.c -o check -ll

./check

www.google.com

www.my-site.org

hello

valid url

valid url

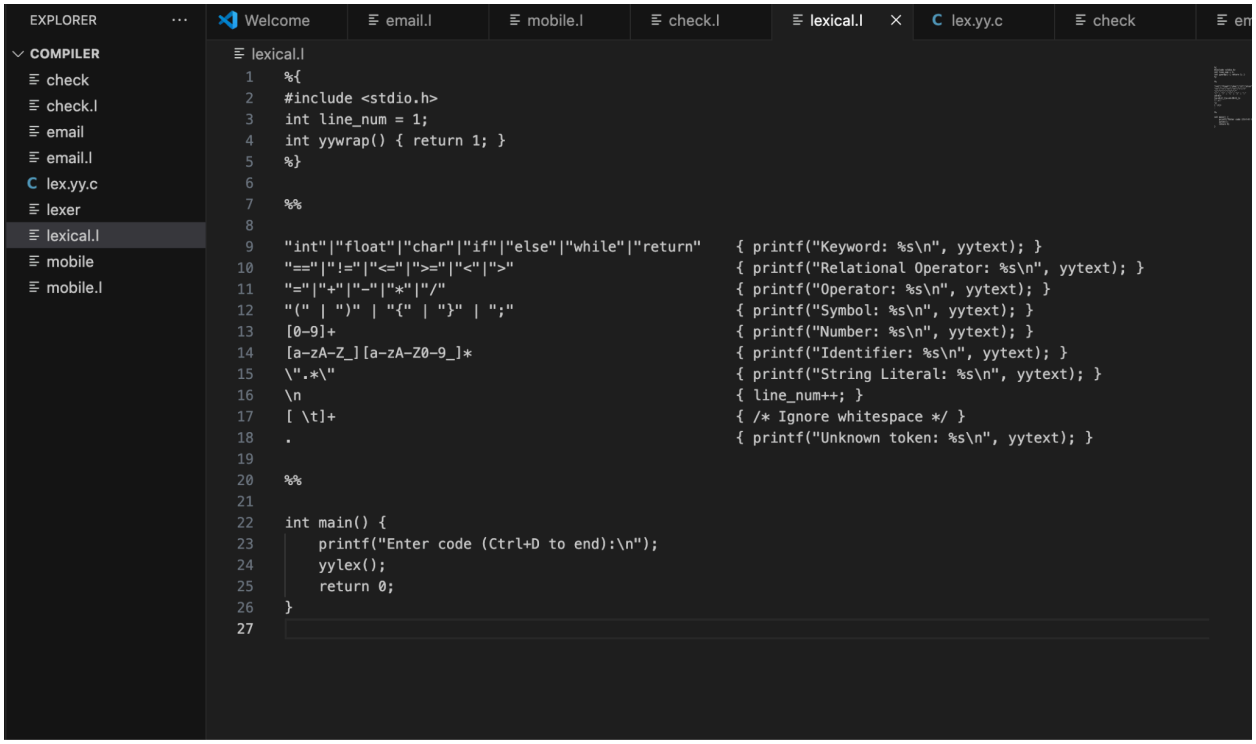
invalid url

```
^C
bhoomi@Bhoomis-MacBook-Air compiler % flex check.l

bhoomi@Bhoomis-MacBook-Air compiler % gcc lex.yy.c -o check -I/opt/homebrew/opt/
flex/include -L/opt/homebrew/opt/flex/lib -lfl

bhoomi@Bhoomis-MacBook-Air compiler % ./check
www.vit.ac.in
valid url
bhoomi@3
invalid url
```

Q4. Lexical Analyser

Code:

```
%{
#include <stdio.h>
int line_num = 1;
int yywrap() { return 1; }
%}

%%

"int"|"float"|"char"|"if"|"else"|"while"|"return"    { printf("Keyword: %s\n", yytext); }
"=="|"!="|"<="|">="|"<"|">"                          { printf("Relational Operator: %s\n", yytext); }
"="|"+"|"-"|"*"|"/"                                  { printf("Operator: %s\n", yytext); }
"(" | ")" | "{" | "}" | ";"                          { printf("Symbol: %s\n", yytext); }
[0-9]+                                               { printf("Number: %s\n", yytext); }
[a-zA-Z_][a-zA-Z0-9_]*                               { printf("Identifier: %s\n", yytext); }
\".*\"                                               { printf("String Literal: %s\n", yytext); }
\n                                                   { line_num++; }
[ \t]+                                               { /* Ignore whitespace */ }
.                                                    { printf("Unknown token: %s\n", yytext); }

%%

int main() {
    printf("Enter code (Ctrl+D to end):\n");
    yylex();
    return 0;
}
```



Output:

```
bhoomi@Bhoomis-MacBook-Air compiler % flex lexical.l
gcc lex.yy.c -o lexical -ll

bhoomi@Bhoomis-MacBook-Air compiler % ./lexical

Enter code (Ctrl+D to end):
int main() {
   int x = 10;
   float y = 20.5;
 Keyword: int
Identifier: main
Number: (
Unknown token: )
Unknown token: {
Keyword: int
Identifier: x
Operator: =
Number: 10
Unknown token: ;
Keyword: float
Identifier: y
Operator: =
Number: 20
Unknown token: .
```

```
Number: 5
Unknown token: ;
  x = x + y;
   if (x > 15) {
       printf("HeIdentifier: x
Operator: =
Identifier: x
Operator: +
Identifier: y
Unknown token: ;
Keyword: if
Number: (
Identifier: x
Relational Operator: >
Number: 15
Unknown token: )
Unknown token: {
llo World");
   }
   return 0;
}
Identifier: printf
Number: (
String Literal: "Hello World"
Unknown token: )
Unknown token: ;
Unknown token: }
Keyword: return
Number: 0
Unknown token: ;
Unknown token: }
```

```
bhoomi@Bhoomis-MacBook-Air compiler % ./lexical

Enter code (Ctrl+D to end):
int main() {
    int x = 10;
    float y = 20.5;
 Keyword: int
Identifier: main
Number: (
Unknown token: )
Unknown token: {
Keyword: int
Identifier: x
Operator: =
Number: 10
Unknown token: ;
Keyword: float
Identifier: y
Operator: =
Number: 20
Unknown token: .
Number: 5
Unknown token: ;
   x = x + y;
    if (x > 15) {
        printf("HeIdentifier: x
Operator: =
Identifier: x
Operator: +
Identifier: y
Unknown token: ;
Keyword: if
Number: (
Identifier: x
Relational Operator: >
Number: 15
Unknown token: )
Unknown token: {
llo World");
    }
    return 0;
}
Identifier: printf
Number: (
String Literal: "Hello World"
Unknown token: )
Unknown token: ;
Unknown token: }
Keyword: return
Number: 0
Unknown token: ;
Unknown token: }
```

Q5. Write a LEX code to count single line comment and multiline comments in a file.

Code:

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

int single_count = 0;
int multi_count = 0;
%}

%%
"//".*                  { single_count++; }
"/*"([^*]|\*+[^*/])*"*/"  { multi_count++; }
.                       { /* ignore other characters */ }
\n                      { /* ignore newlines */ }
%%

int main(int argc, char *argv[]) {
    if (argc > 1) {
        FILE *file = fopen(argv[1], "r");
        if (!file) {
            perror("Error opening file");
            return 1;
        }
        yyin = file;
    }

    yylex();

    printf("Single-line comments: %d\n", single_count);
    printf("Multi-line comments: %d\n", multi_count);

    return 0;
}

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

comment_counter.l

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

int single_count = 0;
int multi_count = 0;
%}

%%
"//".*                    { single_count++; }
"/*"([^*]|\*+[^*/])*"*/"  { multi_count++; }
.                          { /* ignore other characters */ }
\n                         { /* ignore newlines */ }
%%

int main(int argc, char *argv[]) {
    if (argc > 1) {
        FILE *file = fopen(argv[1], "r");
        if (!file) {
            perror("Error opening file");
            return 1;
        }
        yyin = file;
    }

    yylex();

    printf("Single-line comments: %d\n", single_count);
    printf("Multi-line comments: %d\n", multi_count);

    return 0;
}

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

Input file:

```
#include <stdio.h>

int main() {
   // Single-line comment 1
   // Single-line comment 2

   /* Multi-line comment 1 */

   printf("Hello World\n"); // Single-line comment 3
```

```
    /* Multi-line comment 2
       still multi-line */

    int x = 5;
    /* Multi-line comment 3 */
    printf("Value: %d\n", x);

    // Single-line comment 4

    return 0;
}
```

Output:
bhoomi@Bhoomis-MacBook-Air compiler % flex comment_counter.l
gcc lex.yy.c -o comment_counter -ll
./comment_counter input.c

Single-line comments: 4
Multi-line comments: 3
bhoomi@Bhoomis-MacBook-Air compiler %

```
bhoomi@Bhoomis-MacBook-Air compiler % flex comment_counter.l
gcc lex.yy.c -o comment_counter -ll
./comment_counter input.c

Single-line comments: 4
Multi-line comments: 3
bhoomi@Bhoomis-MacBook-Air compiler %
```