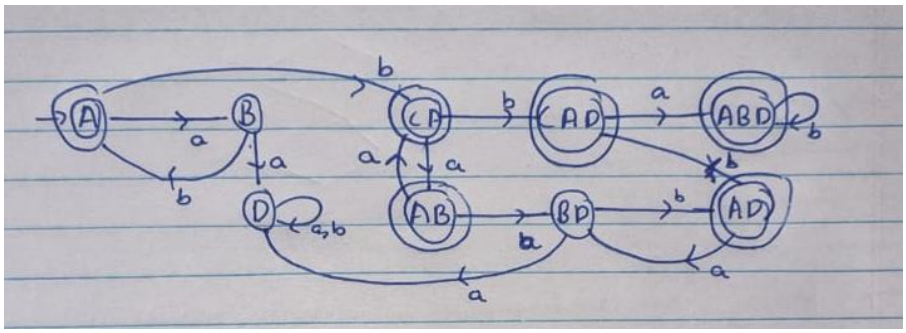
Experiment 5

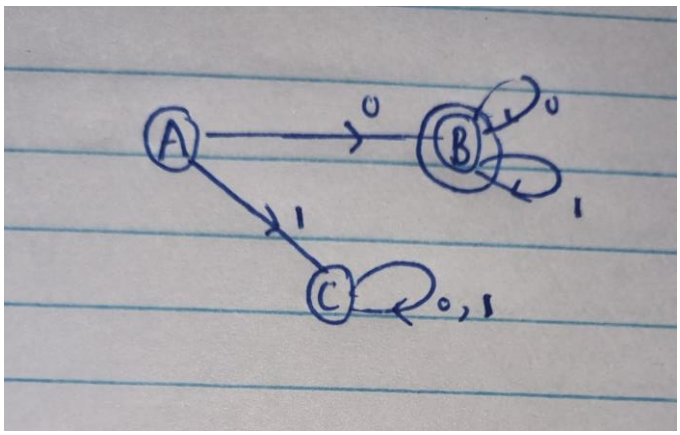
Lex DFA

Exercise 5

Q1



Q2



Q3

Code

```
%{

%}

%s A B DEAD
```

```
%%
<INITIAL>1 BEGIN A;
<INITIAL>0 BEGIN INITIAL;
<INITIAL>[^01\n] BEGIN DEAD;
<INITIAL>\n BEGIN INITIAL; {printf("Accepted\n");}

<A>1 BEGIN INITIAL;
<A>0 BEGIN B;
<A>[^01\n] BEGIN DEAD;
<A>\n BEGIN INITIAL; {printf("Not Accepted\n");}

<B>1 BEGIN B;
<B>0 BEGIN A;
<B>[^01\n] BEGIN DEAD;
<B>\n BEGIN INITIAL; {printf("Not Accepted\n");}



<DEAD>[^\n] BEGIN DEAD;
<DEAD>\n BEGIN INITIAL; {printf("Invalid\n");}
%%

int yywrap()
{
return 1;
}

int main()
{
printf("Enter Number : \n");
yylex();
```

return 0;

}

Output

```
┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ lex cd.l

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ gcc lex.yy.c

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ ./a.out
Enter Number :
110
Accepted
11111
Not Accepted
1111
Accepted
aba
Invalid
1011
Not Accepted
1001
Accepted
```

Q4

Code

%{

%}

%s A B C DEAD

%%

<INITIAL>1 BEGIN A;

<INITIAL>0 BEGIN C;

```
<INITIAL>[^01\n] BEGIN DEAD;
<INITIAL>\n BEGIN INITIAL; {printf("Not Accepted\n");}

<A>1 BEGIN INITIAL;
<A>0 BEGIN B;
<A>[^01\n] BEGIN DEAD;
<A>\n BEGIN INITIAL; {printf("Accepted\n");}

<B>1 BEGIN C;
<B>0 BEGIN A;
<B>[^01\n] BEGIN DEAD;
<B>\n BEGIN INITIAL; {printf("Accepted\n");}

<C>1 BEGIN B;
<C>0 BEGIN INITIAL;
<C>[^01\n] BEGIN DEAD;
<C>\n BEGIN INITIAL; {printf("Accepted\n");}


<DEAD>[^\n] BEGIN DEAD;
<DEAD>\n BEGIN INITIAL; {printf("Invalid\n");}
%%



int yywrap()
{
return 1;
}

int main()
```

```
{
printf("Enter Number : \n");
yylex();
return 0;
}
```

Output

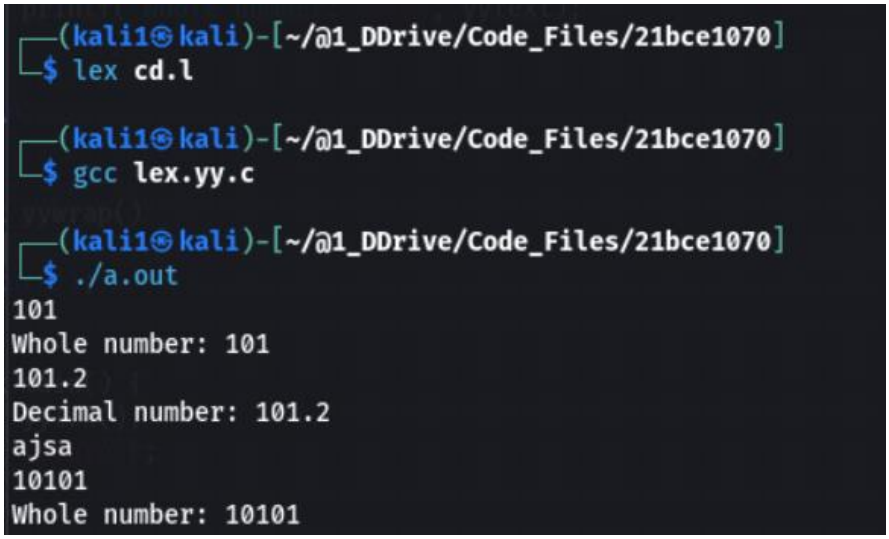
```
┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ lex cd.l

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ gcc lex.yy.c

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ ./a.out
Enter Number :
101
Accepted
1100
Not Accepted
001
Accepted
000
Accepted
Not Accepted
00011
Accepted
0101010101
Accepted
```

Lex Program

Q1

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

%%
[0-9]+\.[0-9]+ {
```

```
    printf("Decimal number: %s\n", yytext);
}

[0-9]+ {
    printf("Whole number: %s\n", yytext);
}

.|\n
%%

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



Q2

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

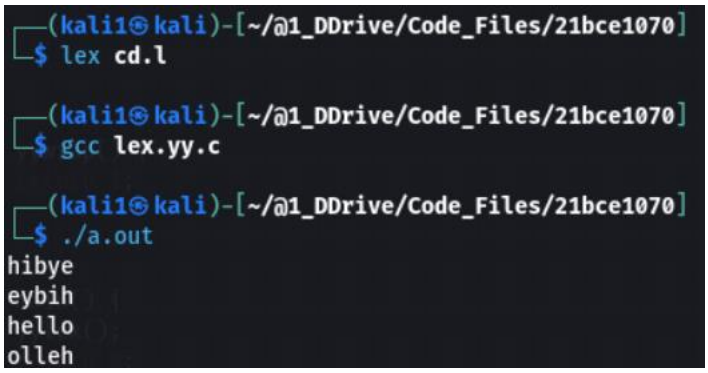
```
%%
[ \t]+ {
    whitespace_count += yyleng; // Increment count by length of whitespace
}

\n {
    printf("Number of whitespace characters: %d\n", whitespace_count);
    whitespace_count = 0; // Reset the count for the next input
}

.|\n

%%

int yywrap() {
    return 1;
}

int main() {
    printf("Enter a string:\n");
    yylex();
    return 0;
}
```

```
┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ lex cd.l

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ gcc lex.yy.c

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ ./a.out
Enter a string:
hello aj jka a
Number of whitespace characters: 3
hhh haj kas kak a
Number of whitespace characters: 6
```

Q3

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

%%
[a-zA-Z]+ {
   int length = yyleng;
   char reversed[length + 1];
   int i, j;
   for (i = 0, j = length - 1; i < length; i++, j--) {
      reversed[i] = yytext[j];
   }
   reversed[length] = '\0';
   printf("%s ", reversed);
}

.|\n

%%
int yywrap() {
```

```
    return 1;
}



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



Q4

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

char word[100];
int count = 0;
%}

%%
[a-zA-Z]+ {
    if (strcmp(yytext, word) == 0)
        count++;
}
. ;
```

```
%%

int yywrap() {
    return 1;
}

int main() {
    printf("Enter the word to search: ");
    scanf("%s", word);

    FILE *file = fopen("first.txt", "r");
    if (file == NULL) {
        printf("Error opening file: first.txt\n");
        return 1;
    }

    yyin = file;
    yylex();

    printf("Frequency of word '%s': %d\n", word, count);

    fclose(file);
    return 0;
}
```

first.txt

```
hi hello
bye ho
hi
 bye
```

```
┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
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┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ gcc lex.yy.c

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ ./a.out
Enter the word to search: hi




Frequency of word 'hi': 2

┌──(kali1㉿kali)-[~/@1_DDrive/Code_Files/21bce1070]
└─$ ./a.out
Enter the word to search: hhh




Frequency of word 'hhh': 0
```