Symbiosis Institute of Technology, Pune

Faculty of Engineering

CSE- Academic Year 2025-26

Compiler Construction Lab Batch 2022-26

Lab Assignment No: - 4

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Batch: 2022-26

Class: CSE C2

Semester – 7th

Title of Assignment: Conversion of lowercase to uppercase and vice versa.

Practice Questions

1. LEX code for conversion of lowercase to uppercase and vice versa.
2. LEX code to check whether the given character is in upper case, or in lower case or non-alphabetic character.
3. LEX code to count the lowercase, upper case characters in the given input file.

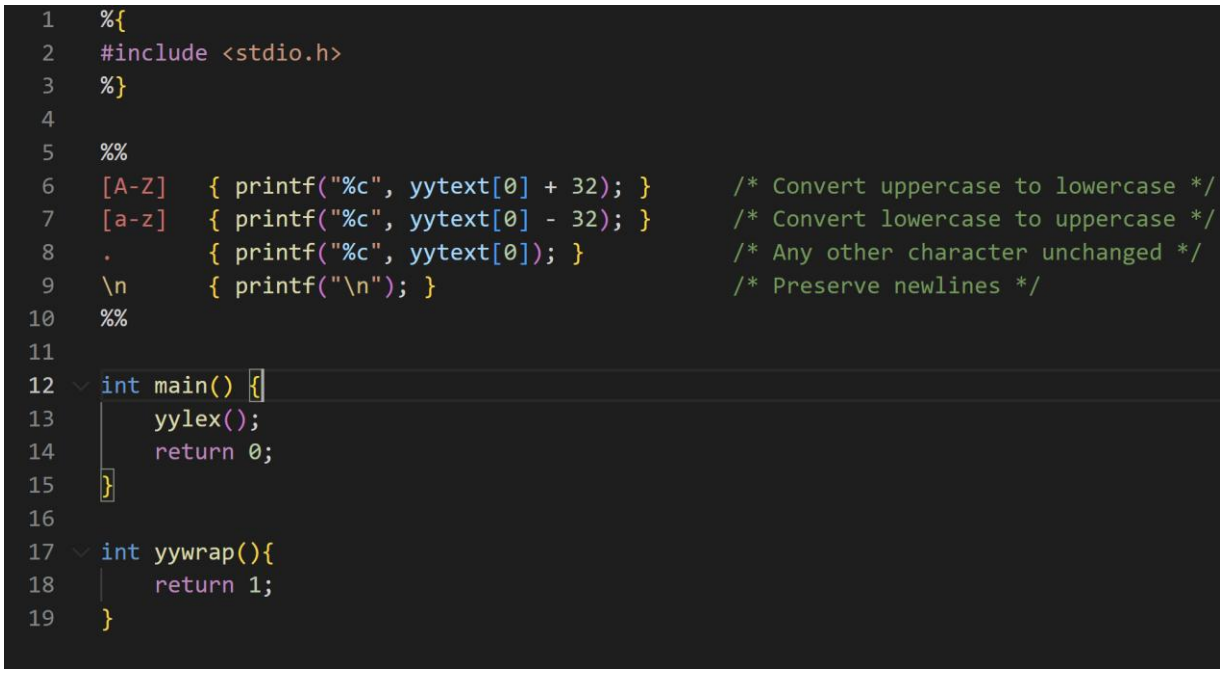
Source Code

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

%%
[A-Z]   { printf("%c", yytext[0] + 32); }      /* Convert uppercase to lowercase */
[a-z]   { printf("%c", yytext[0] - 32); }      /* Convert lowercase to uppercase */
.       { printf("%c", yytext[0]); }           /* Any other character unchanged */
\n      { printf("\n"); }                      /* Preserve newlines */
%%

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

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



Output Screenshot

```
PS C:\Users\Soham\Documents\SEM7\Sem7 codes> ./case_converter
Hello World
hELLO wORLD
soham
SOHAM
```

LEX code to check whether the given character is in upper case, or in lower case or non-alphabetic character.

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

%%
[A-Z]   { printf("Uppercase character: %c\n", yytext[0]); }
[a-z]   { printf("Lowercase character: %c\n", yytext[0]); }
.       { printf("Non-alphabetic character: %c\n", yytext[0]); }
\n      ; /* Ignore newline */
%%

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

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

OUTPUT:

```
PS C:\Users\Soham\Documents\SEM7\Sem7 codes> ./case_checker
SOham PhadKE1234@@@@
Uppercase character: S
Uppercase character: O
Lowercase character: h
Lowercase character: a
Lowercase character: m
Non-alphabetic character:
Uppercase character: P
Lowercase character: h
Lowercase character: a
Lowercase character: d
Uppercase character: K
Uppercase character: E
Non-alphabetic character: 1
Non-alphabetic character: 2
Non-alphabetic character: 3
Non-alphabetic character: 4
Non-alphabetic character: @
Non-alphabetic character: @
Non-alphabetic character: @
Non-alphabetic character: @
```

LEX code to count the lowercase, upper case characters in the given input file.

case_counter.l

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

%%
[A-Z]    { upperCount++; }    /* Uppercase letters */
[a-z]    { lowerCount++; }    /* Lowercase letters */
.|\n     ;                    /* Ignore everything else */
%%

int main(void) {
    yylex();
    printf("Uppercase letters: %d\n", upperCount);
    printf("Lowercase letters: %d\n", lowerCount);
    return 0;
}

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

OUTPUT

```
PS C:\Users\Soham\Documents\SEM7\Sem7 codes> echo "Soham PHADKE" | ./case_counter
Uppercase letters: 7
Lowercase letters: 4
```

POST LAB QUESTIONS

LEX code for case conversion of alphabets/**alphanumeric** term using file handling.

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

FILE *out = NULL;
%}

%%
[a-z]      { fputc(yytext[0] - 'a' + 'A', out); }  /* lower → UPPER */
[A-Z]      { fputc(yytext[0] - 'A' + 'a', out); }  /* UPPER → lower */
[0-9]      { fputc(yytext[0], out); }              /* digits unchanged */
\n         { fputc('\n', out); }                   /* preserve newlines */
.          { fputc(yytext[0], out); }              /* other chars unchanged */
%%

int main(int argc, char *argv[]) {
    if (argc != 3) {
        fprintf(stderr, "Usage: %s <input_file> <output_file>\n", argv[0]);
        return 1;
    }

    FILE *in = fopen(argv[1], "r");
    if (!in) {
        perror("Failed to open input file");
        return 1;
    }

    out = fopen(argv[2], "w");
    if (!out) {
        perror("Failed to open output file");
        fclose(in);
        return 1;
    }

    yyin = in;      /* tell flex to read from the input file */
    yylex();        /* run the lexer */
```

```
        fclose(in);
        return 1;
    }

    yyin = in;      /* tell flex to read from the input file */
    yylex();        /* run the lexer */

    fclose(in);
    fclose(out);
    return 0;
}

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

OUTPUT

```
~/c/ccl bat input.txt                                              10:11:17
File: input.txt
1   SOHAM PHADKE
~/c/ccl ./case_2 input.txt output.txt                              10:11:19
~/c/ccl bat output.txt                                             10:11:21
File: output.txt
1   soham phadke
```