



SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Symbiosis International (Deemed University)

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Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

Assignment No. 05

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|-------------------------------------|---|
| Subject: | Compiler Construction Lab |
| Name of Student | Onkar Mendhapurkar |
| PRN No. | 22070122135 |
| Branch | CSE B2, Batch (2022-26) |
| Academic Year & Semester | 2022-26 |
| Date of Performance | 28/08/2025 |
| Title of Assignment: | Conversion of decimal to hexadecimal number in a file. |
| Practice Questions | <ol style="list-style-type: none">1. Write a LEX program for conversion of decimal to hexadecimal number in a file.2. Write a LEX program for decimal to binary conversion. |
| Source Code | <pre>1. %{ #include <stdio.h> #include <stdlib.h> %} %% [0-9]+ { int num = atoi(yytext); printf("%s (decimal) = %X (hexadecimal)\n", yytext, num); } \n { /* ignore newlines */ } . { /* ignore other chars */ } %% int yywrap() { return 1; }</pre> |

```

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

2.
%{
#include <stdio.h>
#include <stdlib.h>

// function to convert decimal to binary
void printBinary(int n) {
    if (n == 0) {
        printf("0");
        return;
    }
    int binary[32];
    int i = 0;
    while (n > 0) {
        binary[i++] = n % 2;
        n /= 2;
    }
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binary[j]);
    }
}
%}

%%
[0-9]+ {
    int num = atoi(yytext);
    printf("%s (decimal) = ", yytext);
    printBinary(num);
    printf(" (binary)\n");
}

\n      { /* ignore newlines */ }
.       { /* ignore other chars */ }
%%

int yywrap() { return 1; }

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

```

}

Output Screenshot

1.

```
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL$ cd Assign5/
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ ls
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ nano dec2hex.l
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ flex dec2hex.l
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ gcc lex.yy.c -lfl -o dec2hex
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ cat dec2hex.l
%{
#include <stdio.h>
#include <stdlib.h>
%}

%%
[0-9]+ {
    int num = atoi(yytext);
    printf("%s (decimal) = %X (hexadecimal)\n", yytext, num);
}
\n { /* ignore newlines */ }
. { /* ignore other chars */ }
%%

int yywrap() { return 1; }

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

battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ ./dec2hex < input.txt
-bash: input.txt: No such file or directory
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ nano input.txt
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ cat input.txt
10
255
1024
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ ./dec2hex < input.txt
10 (decimal) = A (hexadecimal)
255 (decimal) = FF (hexadecimal)
1024 (decimal) = 400 (hexadecimal)
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ |
```

2.

```
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ ./dec2hex < input.txt
10 (decimal) = A (hexadecimal)
255 (decimal) = FF (hexadecimal)
1024 (decimal) = 400 (hexadecimal)
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ nano dec2bin.l
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ cat dec2bin.l
%{
#include <stdio.h>
#include <stdlib.h>

// function to convert decimal to binary
void printBinary(int n) {
    if (n == 0) {
        printf("0");
        return;
    }
    int binary[32];
    int i = 0;
    while (n > 0) {
        binary[i++] = n % 2;
        n /= 2;
    }
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binary[j]);
    }
}
%}

%%
[0-9]+ {
    int num = atoi(yytext);
    printf("%s (decimal) = ", yytext);
    printBinary(num);
    printf(" (binary)\n");
}
\n { /* ignore newlines */ }
. { /* ignore other chars */ }
%%

int yywrap() { return 1; }

battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign5$ flex dec2bin.l
gcc lex.yy.c -lfl -o dec2bin
./dec2bin < input.txt
10 (decimal) = 1010 (binary)
255 (decimal) = 11111111 (binary)
1024 (decimal) = 10000000000 (binary)
```

Code:

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

%%

0[xX][0-9a-fA-F]+ {
    int num = (int)strtol(yytext, NULL, 16);
    printf("%d\n", num); // print each number on a new line
}

[ \t\n]+          ; // ignore whitespace

.                { ECHO; } // keep other characters
%%

int yywrap() {
    return 1;
}

int main(int argc, char **argv) {
    yylex();
    return 0;
}
```

Output:

```
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ cat hex2dec.l
%{
#include <stdio.h>
#include <stdlib.h>
}%

%%

0[xX][0-9a-fA-F]+ {
    int num = (int)strtol(yytext, NULL, 16);
    printf("%d\n", num); // print each number on a new line
}

[ \t\n]+          ; // ignore whitespace

.                { ECHO; } // keep other characters
%%

int yywrap() {
    return 1;
}

int main(int argc, char **argv) {
    yylex();
    return 0;
}

battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ nano hexinput.txt
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ cat hexinput.txt
0xA
0x1F
0xFF
0x3E8
0xabc
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ lex hex2dec.l
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ cc lex.yy.c -o hex2dec
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ ./hex2dec < hexinput.txt > hexoutput.txt
battlemachine@DESKTOP-FU1975B: /mnt/c/Users/DELL/CCL/Assign$ cat hexoutput.txt
10
31
255
1888
```

| | |
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| Conclusion | These LEX programs show how simple rules can automate number system conversions. They highlight the efficiency of lexical analysis in scanning, recognizing patterns, and transforming input seamlessly. |
|------------|--|