



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

Subject:	Compiler Construction Lab
Name of Student	Onkar Mendhapurkar
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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;
}

```

	<pre>}</pre>
Output Screenshot	<p>1.</p> <pre>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\$ </pre>
	<p>2.</p> <pre>battlemachine@DESKTOP-FU1975B:/mnt/c/Users/DELL/CCL/Assign5\$./dec2bin < 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) = 1000000000 (binary)</pre>

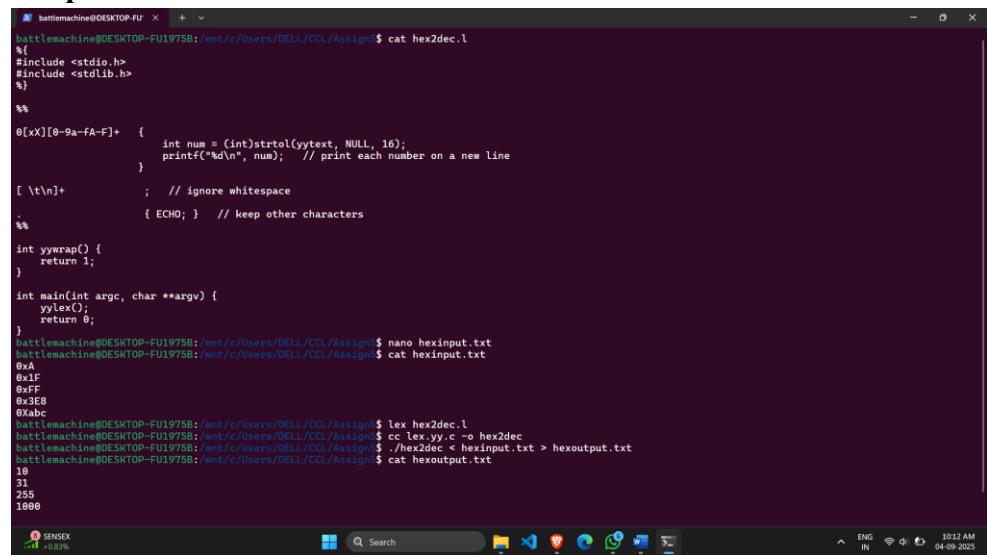
Post lab questions

1. Write a LEX program for Hexadecimal to Decimal conversion.

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:



The screenshot shows a terminal window on a Windows operating system. The command `cat hex2dec.l` is run to view the LEX script. Then, `nano hexinput.txt` is used to edit a file containing the hex values `0xA`, `0xF`, `0x3F`, `0x3E8`, and `0xabc`. Finally, the command `lex hex2dec.l` is run to generate the lexer, followed by `cc lex.yy.c -o hex2dec` to compile it, and `./hex2dec < hexinput.txt > hexoutput.txt` to execute the lexer on the input file, producing the output file `hexoutput.txt` which contains the decimal equivalents `10`, `31`, `255`, and `1080.

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.
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