



**Symbiosis Institute of Technology, Pune**

**Faculty of Engineering**

**CSE- Academic Year 2025-26**

**Compiler Construction Lab Batch 2022-26**

Lab Assignment No: - 5

Name: Soham Phadke

PRN: 22070122214

Batch: 2022-26

Class: CSE C2

Semester – 7<sup>th</sup>

**Title of Assignment: Conversion of decimal to hexadecimal number in a file.**

**Practice Questions**

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.

## Q1.

### Source Code

```
%{
#include <stdio.h>
#include <stdlib.h>
void decimal_to_hex(int n);
%}

%%

[0-9]+ {
    int num = atoi(yytext);
    printf("Hexadecimal equivalent: ");
    decimal_to_hex(num);
    printf("\n");
}
.|\\n ;
%%

void decimal_to_hex(int n) {
    if (n > 0) {
        decimal_to_hex(n/16);
        int rem = n % 16;
        if (rem < 10)
            printf("%d", rem);
        else
            printf("%c", 'A' + (rem - 10));
    }
}

int yywrap() {
    return 1;
}

int main() {
    printf("Enter a decimal number: ");
    yylex();
    return 0;
}
```

```

base_conversion_hex.c
1  %{
2  #include <stdio.h>
3  #include <stdlib.h>
4  void decimal_to_hex(int n);
5  %}
6
7  %%
8  [0-9]+ {
9      int num = atoi(yytext);
10     printf("Hexadecimal equivalent: ");
11     decimal_to_hex(num);
12     printf("\n");
13 }
14 .|\n ;
15 %%
16
17 void decimal_to_hex(int n) {
18     if (n > 0) {
19         decimal_to_hex(n/16);
20         int rem = n % 16;
21         if (rem < 10)
22             printf("%d", rem);
23         else
24             printf("%c", 'A' + (rem - 10));
25     }
26 }
27
28 int yywrap() {
29     return 1;
30 }
31
32 int main() {

```

## Output Screenshot

```

PS C:\Users\Soham\Documents\SEM7\Sem7 codes> ./base_conversion_hex
Enter a decimal number: 10
Hexadecimal equivalent: A
15
Hexadecimal equivalent: F
40
Hexadecimal equivalent: 28

```

## Q2.

### Source Code

```
%{
#include<stdio.h>
int num;
void decimalToBinary(int n);
}%

%%
[0-9]+ {
    num = atoi(yytext);
    printf("Binary equivalent: ");
    decimalToBinary(num);
    printf("\n");
}

. ;
\n ;
%%

void decimalToBinary(int n) {
    if (n > 0) {
        decimalToBinary(n/2);
        printf("%d", n%2);
    }
}

int yywrap() {
    return 1;
}

int main() {
    printf("Enter a decimal number: ");
    yylex();
    return 0;
}
```

base\_conversion\_bin.l

```
1  %{
2  #include<stdio.h>
3  int num;
4  void decimalToBinary(int n);
5  %}
6
7  %%
8  ∨ [0-9]+ {
9      num = atoi(yytext);
10     printf("Binary equivalent: ");
11     decimalToBinary(num);
12     printf("\n");
13 }
14
15 . ;
16 \n ;
17 %%
18
19 ∨ void decimalToBinary(int n) {
20 ∨     if (n > 0) {
21         decimalToBinary(n/2);
22         printf("%d", n%2);
23     }
24 }
25
26 ∨ int yywrap() {
27     return 1;
28 }
29
30 ∨ int main() {
31     printf("Enter a decimal number: ");
32     yylex();
33     return 0;
34 }
```

## OUTPUT

```
PS C:\Users\Soham\Documents\SEM7\Sem7 codes> ./base_conversion_bin
Enter a decimal number: 10
Binary equivalent: 1010
1
Binary equivalent: 1
2
Binary equivalent: 10
50
Binary equivalent: 110010
```

## POST LAB Question:

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

### Source code

```
%{
#include <stdio.h>
#include <math.h>
#include <string.h>
int decimal = 0;
int power = 0;
%}

%%
[0-9A-Fa-f]+ {
    int len = strlen(yytext);
    decimal = 0;
    power = 0;

    for(int i = len-1; i >= 0; i--) {
        if(yytext[i] >= '0' && yytext[i] <= '9')
            decimal += (yytext[i] - '0') * pow(16, power);
        else if(yytext[i] >= 'A' && yytext[i] <= 'F')
            decimal += (yytext[i] - 'A' + 10) * pow(16, power);
        else if(yytext[i] >= 'a' && yytext[i] <= 'f')
            decimal += (yytext[i] - 'a' + 10) * pow(16, power);
        power++;
    }
    printf("Decimal equivalent: %d\n", decimal);
}
```

```
}
```

```
[ \t\n] ; /* Skip whitespace */
```

```
. { printf("Invalid hexadecimal number\n"); }
```

```
%%
```

```
int main() {
```

```
    printf("Enter hexadecimal number: ");
```

```
    yylex();
```

```
    return 0;
```

```
}
```

```
int yywrap() {
```

```
    return 1;
```

```
}
```

base\_conversion\_dec.l

```
1  %{
2  #include <stdio.h>
3  #include <math.h>
4  #include <string.h>
5  int decimal = 0;
6  int power = 0;
7  %}
8
9  %%
10 [0-9A-Fa-f]+ {
11     int len = strlen(yytext);
12     decimal = 0;
13     power = 0;
14
15     for(int i = len-1; i >= 0; i--) {
16         if(yytext[i] >= '0' && yytext[i] <= '9')
17             decimal += (yytext[i] - '0') * pow(16, power);
18         else if(yytext[i] >= 'A' && yytext[i] <= 'F')
19             decimal += (yytext[i] - 'A' + 10) * pow(16, power);
20         else if(yytext[i] >= 'a' && yytext[i] <= 'f')
21             decimal += (yytext[i] - 'a' + 10) * pow(16, power);
22         power++;
23     }
24     printf("Decimal equivalent: %d\n", decimal);
25 }
26
27 [ \t\n] ; /* Skip whitespace */
28 . { printf("Invalid hexadecimal number\n"); }
29
30 %%
31
32 int main() {
33     printf("Enter hexadecimal number: ");
34     yylex();
35     return 0;
36 }
```

## Output

```
PS C:\Users\Soham\Documents\SEM7\Sem7 codes> ./base_conversion_dec
Enter hexadecimal number: A
Decimal equivalent: 10
F
Decimal equivalent: 15
30
Decimal equivalent: 48
```