



**Symbiosis Institute of Technology, Pune**

**Faculty of Engineering**

**CSE- Academic Year 2025-26**

**Compiler Construction Lab Batch 2022-26**

Lab Assignment No: - 5

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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.l
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
```