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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Batch: 2022-26

Class: CSE C2

Semester – 7th

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

```
%{
#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() {
```

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

```
%{
#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;
}
```

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

```
%{
#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;
}
```

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
```