/* C2: Use YACC to Convert Binary to Decimal (including fractional numbers). */

File: C2.y

```
/* definition section*/
%{
    #include<stdio.h>
    #include<stdlib.h>
    #include<math.h>
    //#define YYSTYPE double
    void yyerror(char *s);
    float x = 0;
%}

// creating tokens whose values are given by lex
%token ZERO ONE POINT

// following a grammer rule which is converting binary number to
decimal number (float value)
%%

L: X POINT Y     {printf("%f",$1+x);}
 | X          {printf("%d", $$);}
X: X B          {$$=$1*2+$2;}
 | B          {$$=$1;}
Y: B Y          {x=$1*0.5+x*0.5;}
 |           {;}
B:ZERO          {$$=$1;}
 |ONE          {$$=$1;};

%%
// main function
int main()
{
    printf("Enter the binary number : ");
    // calling yyparse function which execute grammer rules and
lex
    while(yyparse());
    printf("\n");
}
// if any error
void yyerror(char *s)
{
    fprintf(stdout,"\n%s",s);
}
```

1

File: C2.l

```
/* definitions */
%{
      // including required header files
      #include<stdio.h>
      #include<stdlib.h>
      #include"y.tab.h"
      // declaring a external variable yylval
      extern int yylval;
%}

/* rules
 if 0 is matched ,make yylval to 0 and return ZERO which is
variable in Yacc program
 if 1 is matched ,make yylval to 1 and return ONE which is
variable in Yacc program
 if . is matched ,return POINT which is variable in Yacc program
 if line change , return 0
 otherwise ,ignore*/
%%

0     {yylval=0;return ZERO;}
1     {yylval=1;return ONE;}
"."   {return POINT;}

[ \t]{;}
\n    return 0;

%%
```

Terminal

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C2   C2.l   C2.y   lex.yy.c   y.tab.c   y.tab.h

```
usnraju@usnraju-PC: ~/CompilerDesignPrograms/Set_C/C2
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ yacc -d C2.y
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ lex C2.l
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ gcc y.tab.c lex.yy.c -o C2 -ll
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ ./C2
Enter the binary number : 111.011
7.375000
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ ./C2
Enter the binary number : 101101100
364
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$ ./C2
Enter the binary number : 10110.1100
22.750000
(base) usnraju@usnraju-PC:~/CompilerDesignPrograms/Set_C/C2$
```