Lab9: Yacc useful for your language / any other highlevel language.

Aim: Write a program to make Yacc useful for your language / any other highlevel langauge.

Input of program- Grammar and input string to be parsed in your project's language. OR any other sufficiently complex grammar of ANY language , NOT covered in lab manual directly.
Output of program- appropriate action.

Project no: 5

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Following is a valid sentence in a layman friendly "comparison " program. Generate its appropriate language description and compiler-

- Valid sentences in language :
    1. Which is bigger number 7 or 2?
    2. From 7 and 2 which is larger?
    3. Is 7 bigger than 2?
    4. Is 2 smaller than 4?
    5. Which is smaller between 4 and 9?
    6. Which is smaller number 4 or 2?
    7. Is 7 less than 2?
    8. Is 9 greater than 4?

Flex code: lab9.l

```
%{
        #include<stdio.h>
        #include "y.tab.h"
          int yyerror(char *errormsg);
          int yyparse();
        int t=0;
%}
WH    "Which"
WHI   "which"
```

```
IS      "Is"
ISS "is"
FR      "From"
NU      "number"
OR      "or"
ND      "and"
BW      "between"
TN      "than"
BG      "bigger"
GR      "greater"
LG      "larger"
SM      "smaller"
LS      "less"
QM      "?"
Digit  [0-9]
Int     {Digit}+
Float  {Digit}+(\.{Digit}+)?(E[+\-]?{Digit}+)?
INTEGER    Int|Float
DELIM       [ \t\n]
WS     {DELIM}+

%%

{Int}    {return INTEGER;}
{Float}{return INTEGER;}
{QM}  {return QM;}
{WH}  {return WH;}
{WHI} {return WHI;}
{IS}      {return IS;}
{ISS}    {return ISS;}
{FR} {return FR;}
{NU} {return NU;}
{OR} {return OR;}
{ND} {return ND;}
{BW}{return BW;}
{TN} {return TN;}
{BG} {return BG;}
{GR} {return GR;}
{LG} {return LG;}
{SM} {return SM;}
{LS}  {return LS;}
{WS}{}
.       {yyerror("Error: Undefined character.");}
```

```
%%

int yywrap()
{
        return 1;
}
int main()
{
      printf("\n** Project-5 **\n\n");
      printf("Enter Input String: \n");
      yyparse();
      printf("\n");
   return 0;
}
int yyerror(char *ErrorHere)
{
   fprintf(stderr, "%s\n", ErrorHere);
   exit(1);
}
```

Bison code: lab9.y

```
%{
 #include <stdio.h>
 #include <stdlib.h>
 int yylex(void);
 int yyerror(const char *s);
%}

%token INTEGER QM WH WHI IS ISS FR NU OR ND BW TN BG GR LG
SM LS

%%

program:
   wh iss bg nu int or int qm
   fr int nd int whi iss lg qm
   is int bg tn int qm
   is int sm tn int qm
   wh iss sm bw int nd int qm
   wh iss sm nu int or int qm
   is int ls tn int qm
   is int gr tn int qm
```

```
    ;

int: INTEGER {printf("Here : Integer\n");} ;

wh:    WH {printf("Keyword : Which\n");} ;

whi: WHI {printf("Keyword : which\n");} ;

is:    IS      {printf("Keyword : Is\n");} ;

fr:    FR      {printf("Keyword : From\n");} ;

iss: ISS {printf("Keyword : is\n");} ;

nu:    NU    {printf("Keyword : number\n");} ;

or:    OR    {printf("Keyword : or\n");}      ;

nd:    ND    {printf("Keyword : and\n");} ;

bw:    BW    {printf("Keyword : between\n");} ;

tn:    TN    {printf("Keyword : than\n");} ;

bg:    BG    {printf("Keyword : bigger\n");};

gr:    GR    {printf("Keyword : greater\n");} ;

lg:    LG    {printf("Keyword : larger\n");} ;

sm:    SM    {printf("Keyword : smaller\n");} ;

ls:    LS    {printf("Keyword : less\n");} ;

qm:    QM {printf("Punctuation : ?\n\n-------------------------------------------
\n\n");} ;
```

Output Screenshots:

- Valid sentences in language :

    - Which is bigger number 7 or 2?
    - From 7 and 2 which is larger?
    - Is 7 bigger than 2?
    - Is 2 smaller than 4?
    - Which is smaller between 4 and 9?
    - Which is smaller number 4 or 2?
    - Is 7 less than 2?
    - Is 9 greater than 4?

```
aanandi@Aanandi: /mnt/f/IT088/LT/Lab9 (yacc-p)
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ flex lab9.l
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ bison -dy lab9.y
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ gcc lex.yy.c y.tab.c -o lab9 -lm
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ ./lab9

** Project-5 **

Enter Input String:
Which is bigger number 7 or 2 ?
Keyword : Which
Keyword : is
Keyword : bigger
Keyword : number
Here : Integer
Keyword : or
Here : Integer
Punctuation : ?

--------------------------------------------

From 7 and 2 which is larger ?
Keyword : From
Here : Integer
Keyword : and
Here : Integer
Keyword : which
Keyword : is
Keyword : larger
Punctuation : ?

--------------------------------------------
```

```
aanandi@Aanandi: /mnt/f/IT088/LT/Lab9 (yacc-p)
----------------------------------------------

Is 7 bigger than 2 ?
Keyword : Is
Here : Integer
Keyword : bigger
Keyword : than
Here : Integer
Punctuation : ?

----------------------------------------------

Is 2 smaller than 4 ?
Keyword : Is
Here : Integer
Keyword : smaller
Keyword : than
Here : Integer
Punctuation : ?

----------------------------------------------

Which is smaller between 4 and 9 ?
Keyword : Which
Keyword : is
Keyword : smaller
Keyword : between
Here : Integer
Keyword : and
Here : Integer
Punctuation : ?
```

```
aanandi@Aanandi: /mnt/f/IT088/LT/Lab9 (yacc-p)
----------------------------------------------

Which is smaller number 4 or 2 ?
Keyword : Which
Keyword : is
Keyword : smaller
Keyword : number
Here : Integer
Keyword : or
Here : Integer
Punctuation : ?

----------------------------------------------

Is 7 less than 2 ?
Keyword : Is
Here : Integer
Keyword : less
Keyword : than
Here : Integer
Punctuation : ?

----------------------------------------------
```

```
Is 9 greater than 4 ?
Keyword : Is
Here : Integer
Keyword : greater
Keyword : than
Here : Integer
Punctuation : ?


-------------------------------------------------
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ ./lab9
```

Invalid Sentence:

```
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$ ./lab9

** Project-5 **

Enter Input String:
Which is not a number . ?
Keyword : Which
Keyword : is
Error: Undefined character.
aanandi@Aanandi:/mnt/f/IT088/LT/Lab9 (yacc-p)$
```