

Name: Mohammad Awais
Class: BSCS-8-A
CMS: 242554

Compiler Construction Lab 6

Common Flex Specification Code

calc.l

```
%{  
#include "calculator.tab.h"  
%}  
  
%%  
[0-9]+ { yylval = atoi(yytext); return T_Int; }  
[-+*/\n] { return yytext[0]; }  
. { /* ignore everything else */ }  
%%
```

Prefix Calculator

Code:

calculator.y

```
%{  
#include <stdio.h>  
  
void Push(int data);  
int Pop();  
int Top();  
  
%}  
  
%token T_Int  
  
%%  
S : S E '\n' { printf("= %d\n", Top()); }  
||
```

```

;
E : '+' E E { Push(Pop() + Pop()); }
| '-' E E { int op2 = Pop(); Push(Pop() - op2); }
| '*' E E { Push(Pop() * Pop()); }
| '/' E E { int op2 = Pop(); Push(Pop() / op2); }
| T_Int { Push(yylval); }
;
%%

```

```

const int MAXSIZE = 40;
static int stack[40];

```

```

void Push(int data){
for (int i = MAXSIZE-1; i>0;i--){
stack[i]=stack[i-1];
}
stack[0] = data;
}

```

```

int Pop(){
int data = stack[0];
for (int i = 0; i<MAXSIZE;i++){
stack[i]=stack[i+1];
}
return data;
}

```

```

int Top(){
return stack[0];
}

```

```

int main() {
return yyparse();
}

```

Output:

```
scolopendra@scolopendra-bytes: ~/Local Disk Egg/University/De...
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ bison -d calculator.y
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c calculator.tab.c
calculator.tab.c: In function 'yyparse':
calculator.tab.c:1219:16: warning: implicit declaration of function 'yylex' [-Wimplicit-function-declaration]
1219 |         yychar = yylex ();
      |                   ^~~~~~
calculator.tab.c:1382:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1382 |         yyerror (YY_("syntax error"));
      |         ^~~~~~
      |         yyerrok
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ flex calc.l
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c lex.yy.c
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc lex.yy.o calculator.tab.o -ly -ll -o parserPrefix
x
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ ./parserPrefix
+ 4 8
= 12
- 8 4
= 4
* 4 8
= 32
/ 8 4
= 2

```

Infix Calculator

Code:

calculator.y

```
%{
#include <stdio.h>

void Push(int data);
int Pop();
int Top();

}%

%token T_Int
```

```

%%
S : S E '\n' { printf("= %d\n", Top()); }
|
;
E : E '+' E { Push(Pop() + Pop()); }
| E '-' E { int op2 = Pop(); Push(Pop() - op2); }
| E '*' E { Push(Pop() * Pop()); }
| E '/' E { int op2 = Pop(); Push(Pop() / op2); }
| T_Int { Push(yylval); }
;
%%

```

```

const int MAXSIZE = 40;
static int stack[40];

```

```

void Push(int data){
for (int i = MAXSIZE-1; i>0;i--){
stack[i]=stack[i-1];
}
stack[0] = data;
}

```

```

int Pop(){
int data = stack[0];
for (int i = 0; i<MAXSIZE;i++){
stack[i]=stack[i+1];
}
return data;
}

```

```

int Top(){
return stack[0];
}

```

```

int main() {
return yyparse();
}

```

Output:

```
scolopendra@scolopendra-bytes: ~/Local Disk Egg/University/De...
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ bison -d calculator.y
calculator.y: warning: 16 shift/reduce conflicts [-Wconflicts-sr]
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c calculator.tab.c
calculator.tab.c: In function 'yyparse':
calculator.tab.c:1217:16: warning: implicit declaration of function 'yylex' [-Wimplicit-function-declaration]
1217 |         yychar = yylex ();
      |                   ^~~~~~
calculator.tab.c:1380:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1380 |         yyerror (YY_("syntax error"));
      |         ^~~~~~
      |         yyerrok
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ flex calc.l
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c lex.yy.c
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc lex.yy.o calculator.tab.o -ly -ll -o parserInfix
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ ./parserInfix
4 + 8
= 12
8 - 4
= 4
4 * 8
= 32
8 / 4
= 2

```

Postfix Calculator

Code:

calculator.y

```
%{
#include <stdio.h>

void Push(int data);
int Pop();
int Top();

%}

%token T_Int
```

```

%%
S : S E '\n' { printf("= %d\n", Top()); }
|
;
E : E E '+' { Push(Pop() + Pop()); }
| E E '-' { int op2 = Pop(); Push(Pop() - op2); }
| E E '*' { Push(Pop() * Pop()); }
| E E '/' { int op2 = Pop(); Push(Pop() / op2); }
| T_Int { Push(yylval); }
;
%%

```

```

const int MAXSIZE = 40;
static int stack[40];

```

```

void Push(int data){
for (int i = MAXSIZE-1; i>0;i--){
stack[i]=stack[i-1];
}
stack[0] = data;
}

```

```

int Pop(){
int data = stack[0];
for (int i = 0; i<MAXSIZE;i++){
stack[i]=stack[i+1];
}
return data;
}

```

```

int Top(){
return stack[0];
}

```

```

int main() {
return yyparse();
}

```

Output:

```
scolopendra@scolopendra-bytes: ~/Local Disk Egg/University/De...
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ bison -d calculator.y
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c calculator.tab.c
calculator.tab.c: In function 'yyparse':
calculator.tab.c:1215:16: warning: implicit declaration of function 'yylex' [-Wimplicit-function-declaration]
1215 |         yychar = yylex ();
      |                   ^~~~~~
calculator.tab.c:1378:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1378 |         yyerror (YY_("syntax error"));
      |         ^~~~~~
      |         yyerrok
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ flex calc.l
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc -c lex.yy.c
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ gcc lex.yy.o calculator.tab.o -ly -ll -o parserPostfix
scolopendra@scolopendra-bytes:~/Local Disk Egg/University/Debian Semester 7/Compiler Construction/Labs/Lab 6/Code$ ./parserPostfix
4 8 +
= 12
8 4 -
= 4
4 8 *
= 32
8 4 /
= 2

```