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19BCE245

8 October 2022

Compiler Construction

Practical 5

Implement a calculator in YACC

• Code :

calculator.l

```
%{
    #include<stdio.h>
    #include<stdlib.h>
    #include "y.tab.h"
}%

%%

[0-9]+ {yylval.a_number = atoi(yytext); return number;}
[-+*/();] {return yytext[0];}
[ \t\n] {;}
. {ECHO; printf("Not Valid!");}

%%

int yywrap(void)
{
    return 0;
}
```

calculator.y

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

```

#include<stdlib.h>
extern int yylex();
void yyerror(char *s);
%}

%union {int a_number;}
%start line
%token <a_number> number
%type <a_number> exp term factor

%%
line : exp {printf("\n Result: %d \n", $1);};
exp  : term {$$ = $1;} | exp '+' term {$$=$1+$3;} |
exp '-' term {$$=$1-$3;};
term : factor {$$ = $1;} | term '*' factor {$$=$1*$3;} |
term '/' factor {$$=$1/$3;};
factor : number {$$=$1;} | '(' exp ')' {$$=$2;} |
'-' factor {$$=-$2;};
%%

int main(void) {return yyparse();}
void yyerror(char *s){fprintf(stderr, "%s\n", s);}

```

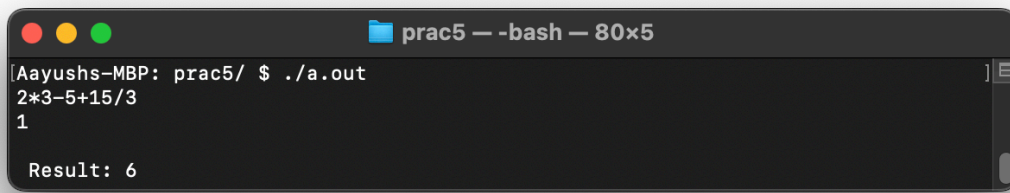
output

- Generating a.out file and giving inputs

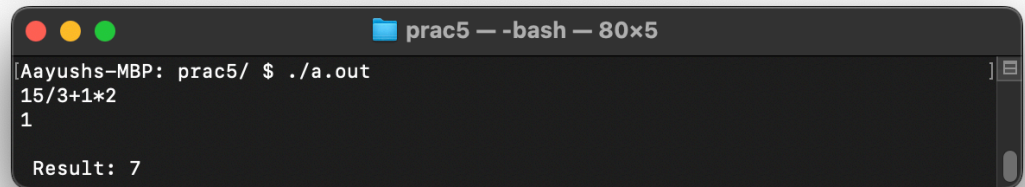
```

prac1      prac3      prac5      prac7
[Aayushs-MBP: prev-years-practicals/ $ cd prac5
[Aayushs-MBP: prac5/ $ ls
18BCE101_CC_Prac5.pdf  calculator.y      y.tab.c
a.out                  input.txt        y.tab.h
calculator.l           lex.yy.c
[Aayushs-MBP: prac5/ $ bison -dy calculator.y
[Aayushs-MBP: prac5/ $ flex calculator.l
[Aayushs-MBP: prac5/ $ gcc lex.yy.c y.tab.c
[Aayushs-MBP: prac5/ $ ls
18BCE101_CC_Prac5.pdf  calculator.y      y.tab.c
a.out                  input.txt        y.tab.h
calculator.l           lex.yy.c
[Aayushs-MBP: prac5/ $ ./a.out
1+2+3+4+5
1
Result: 15

```



```
prac5 — -bash — 80x5
[Aayushs-MBP: prac5/ $ ./a.out
2*3-5+15/3
1
Result: 6
```



```
prac5 — -bash — 80x5
[Aayushs-MBP: prac5/ $ ./a.out
15/3+1*2
1
Result: 7
```