

APL Assignment

Note: I have added an additional check for division when the input is a division by 0, I have handled it gracefully by adding "Division By Zero" in the output in those cases.

Main.Java

```
import java.io.IOException;
import org.antlr.runtime.ANTLRFileStream;
import org.antlr.runtime.CommonTokenStream;
import org.antlr.runtime.RecognitionException;

public class Main {
    public static void main(String[] args) throws IOException,
RecognitionException {
        ExprLexer lexer = new ExprLexer(new ANTLRFileStream(args[0]));
        CommonTokenStream tokens = new CommonTokenStream(lexer);
        ExprParser parser = new ExprParser(tokens);
        parser.prog();
    }
}

grammar Expr;

@header {
package expressionparser;
import java.util.HashMap;
}
@lexer::header {
package expressionparser;
}
@members {
/** Map variable name to Integer object holding value */
HashMap<String, Integer> memory = new HashMap<String, Integer>();
}

prog
:    stat+ ;

stat
:    expr NEWLINE                { System.out.println($expr.value); }
|    ID '=' expr NEWLINE        { memory.put($ID.text, new
Integer($expr.value)); }
|    NEWLINE                    { System.out.println("A newline has been
issued"); }
;

expr returns [int value]
:    e=multExpr                  { $value = $e.value; }
```

```

        ( '+' e=multExpr      { $value += $e.value; }
        | '-' e=multExpr      { $value -= $e.value; }
        ) *
    ;

multExpr returns [int value]
:   e=atom                    { $value = $e.value; }
    (
        '*' e=atom            { $value *= $e.value; }
        | '/' e=atom
        {
            if ($e.value == 0) {
                System.err.println("Error: Division by zero");
            } else {
                $value /= $e.value;
            }
        }
    ) *
;

atom returns [int value]
:   INT                        { $value = Integer.parseInt($INT.text); }
    | ID
    {
        Integer v = (Integer)memory.get($ID.text);
        if (v != null) {
            $value = v.intValue();
        } else {
            System.err.println("Error: Undefined variable " + $ID.text);
        }
    }
    | '(' expr ')'             { $value = $expr.value; }
;

ID      : ('a'..'z' | 'A'..'Z')+ ;
INT     : '0'..'9'+ ;
NEWLINE : ('\r\n' | '\r' | '\n') ;
WS      : (' ' | '\t')+         { skip(); } ;

```

Project

antlr-2

~/Desktop/CIQ-Repo

.idea

out

src

ExprLexer

ExprParser

Main

.gitignore

antlr-2.iml

antlr-complete-3.5.2.jar

Expr.g

Expr.tokens

input.txt

External Libraries

Scratches and Consoles

Main.java

input.txt

Expr.g

Expr.tokens

1

2 + 2

2

2*2*2+5*7

3

A=5

4

B=8

5

C=A * B

6

A

7

B

8

C

9

C-7

10

8/2

11

9/0

12

Run

antlr-2

↶

📷

🔗

💬

⋮

↑

↓

⇅

⇅

🖨

🗑

/Users/ishanksharma/Library/Java/JavaVirtualMachines/corretto-1.8.0_372/Contents/Home/bin/java ...

4

43

5

8

40

33

4

0

Error: Division by zero

Process finished with exit code 0