STRIGER

SER 502-EMERGIN LANGUAGES AND PROGRAMMING PARADIGMS PROJECT GROUP 9

Github: https://github.com/ntarunasy/SER502-Striger-Team9/tree/main

TEAM MEMBERS

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Striger Features

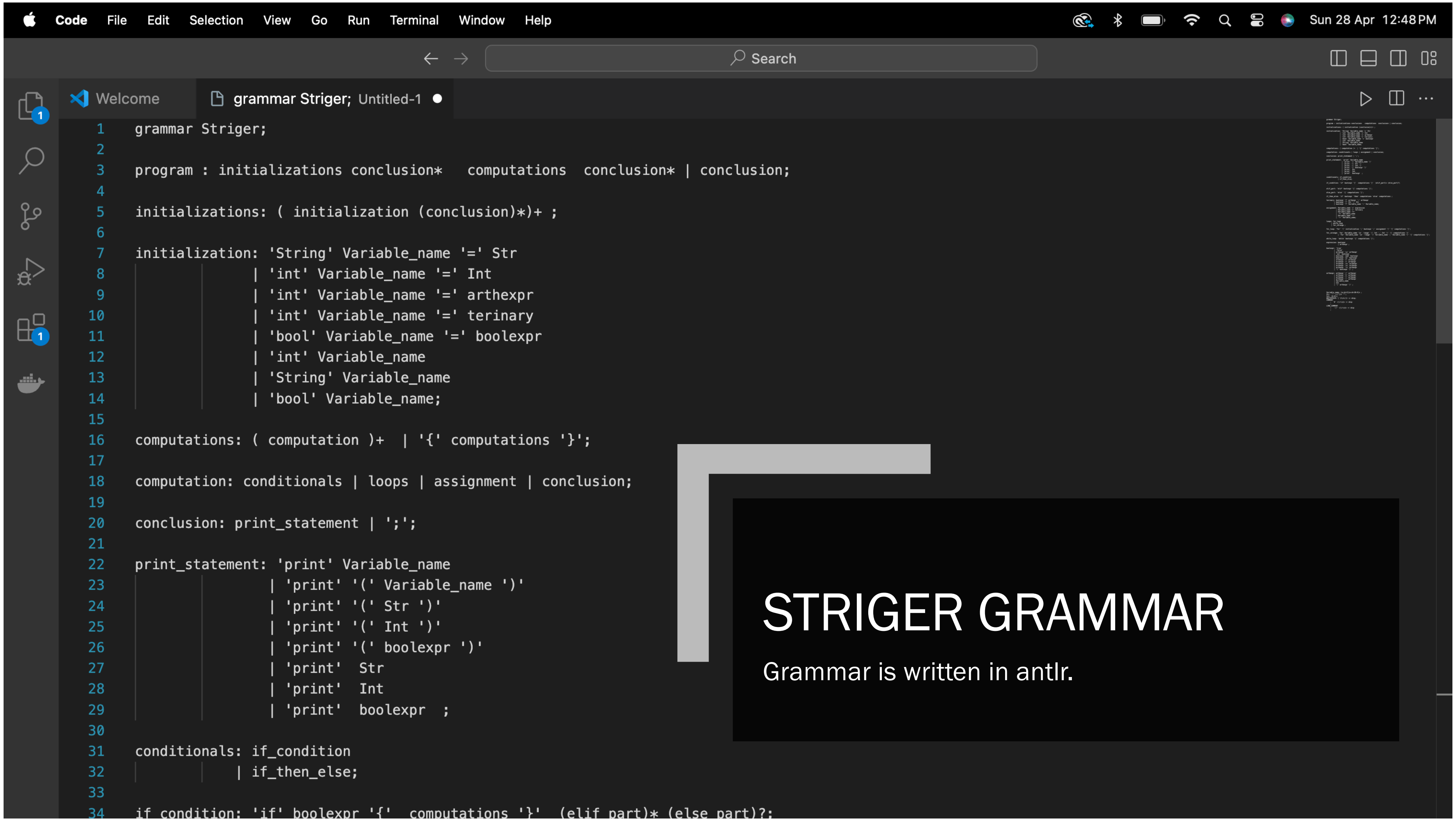
- It supports three types of data types: Integer, String and Boolean.
- It supports two types of printing of variables: print(variable) and print variable.
- It has two types of conditional statements:

1. if_condition: a normal if else condition where add ‘:’ at the end of both the keywords to increase readability of the code.
2. If_then_else:It is also similar to above one, but here there won’t be elif and ‘:’.

- It has three types of loops: for_loop, while_loop and for_inrange.
- The arithmetic operations it support are addition, subtraction, multiplication, division.
- The Boolean operations it support are ‘true’, false, ==, not, and >,<,>=,<=,!=‘.
- Variables name contain small and capital letters, along with numbers. But variable names shouldn’t start with number
- The language basically supports all the basic features of an advanced language.

STRIGER GRAMMAR

Grammar is written in antlr.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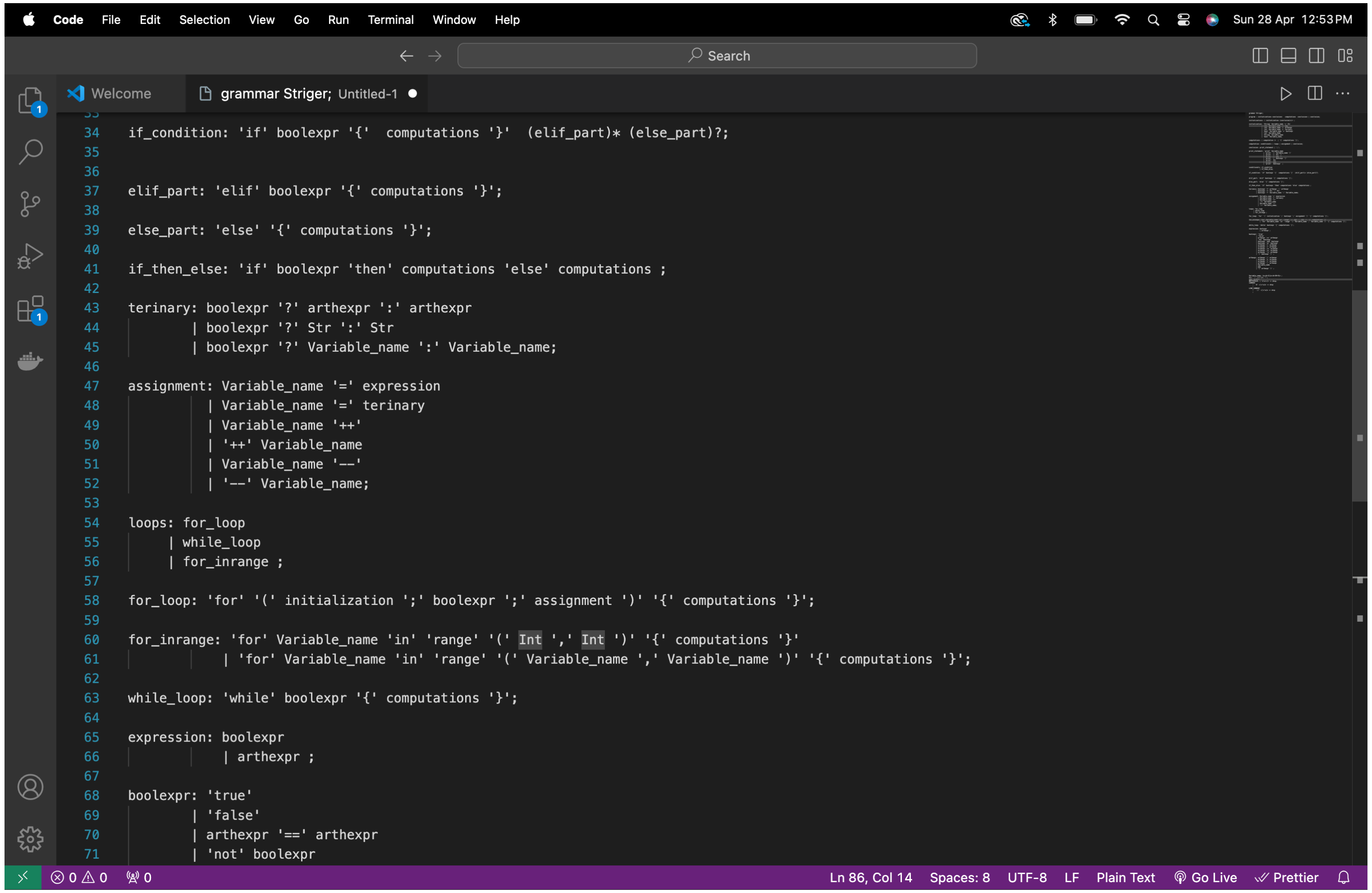
```
grammar Striger;

program : initializations conclusion*   computations  conclusion* | conclusion;

initializations: ( initialization (conclusion)*)+ ;

initialization: 'String' Variable_name '=' Str
              | 'int' Variable_name '=' Int
              | 'int' Variable_name '=' arthexpr
              | 'int' Variable_name '=' terinary
              | 'bool' Variable_name '=' boolexpr
              | 'int' Variable_name
              | 'String' Variable_name
              | 'bool' Variable_name;

computations: ( computation )+  | '{' computations '}';

computation: conditionals | loops | assignment | conclusion;

conclusion: print_statement | ';';

print_statement: 'print' Variable_name
                | 'print' '(' Variable_name ')'
                | 'print' '(' Str ')'
                | 'print' '(' Int ')'
                | 'print' '(' boolexpr ')'
                | 'print'  Str
                | 'print'  Int
                | 'print'  boolexpr  ;

conditionals: if_condition
            | if_then_else;

if_condition: 'if' boolexpr '{'  computations '}'  (elif_part)* (else_part)?;
```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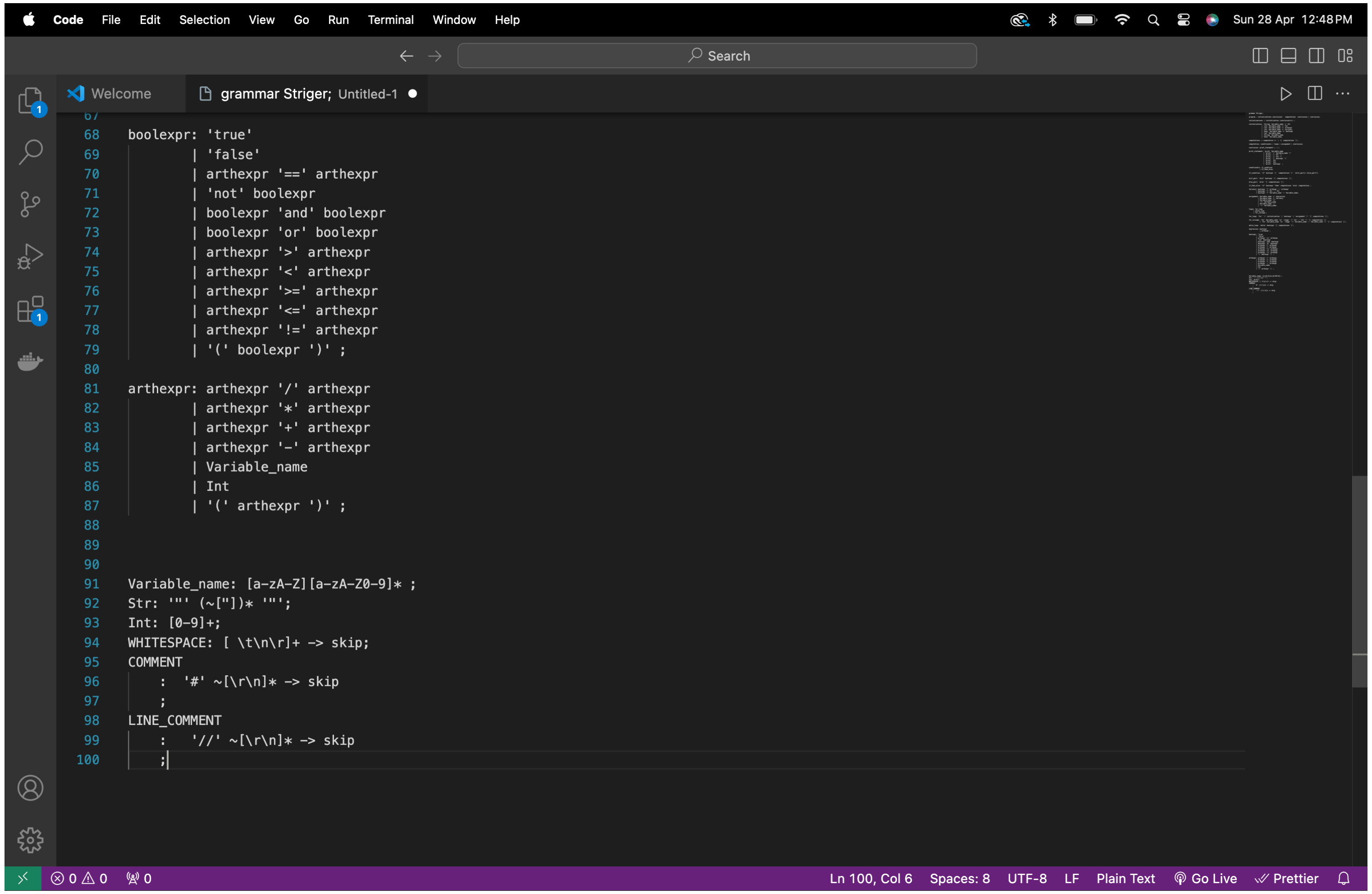
```
if_condition: 'if' boolexpr '{'  computations '}'  (elif_part)* (else_part)?;


elif_part: 'elif' boolexpr '{' computations '}';

else_part: 'else' '{' computations '}';

if_then_else: 'if' boolexpr 'then' computations 'else' computations ;

terinary: boolexpr '?' arthexpr ':' arthexpr
        | boolexpr '?' Str ':' Str
        | boolexpr '?' Variable_name ':' Variable_name;

assignment: Variable_name '=' expression
          | Variable_name '=' terinary
          | Variable_name '++'
          | '++' Variable_name
          | Variable_name '--'
          | '--' Variable_name;

loops: for_loop
     | while_loop
     | for_inrange ;

for_loop: 'for' '(' initialization ';' boolexpr ';' assignment ')' '{' computations '}';

for_inrange: 'for' Variable_name 'in' 'range' '(' Int ',' Int ')' '{' computations '}'
            | 'for' Variable_name 'in' 'range' '(' Variable_name ',' Variable_name ')' '{' computations '}';

while_loop: 'while' boolexpr '{' computations '}';

expression: boolexpr
            | arthexpr ;

boolexpr: 'true'
        | 'false'
        | arthexpr '==' arthexpr
        | 'not' boolexpr
```



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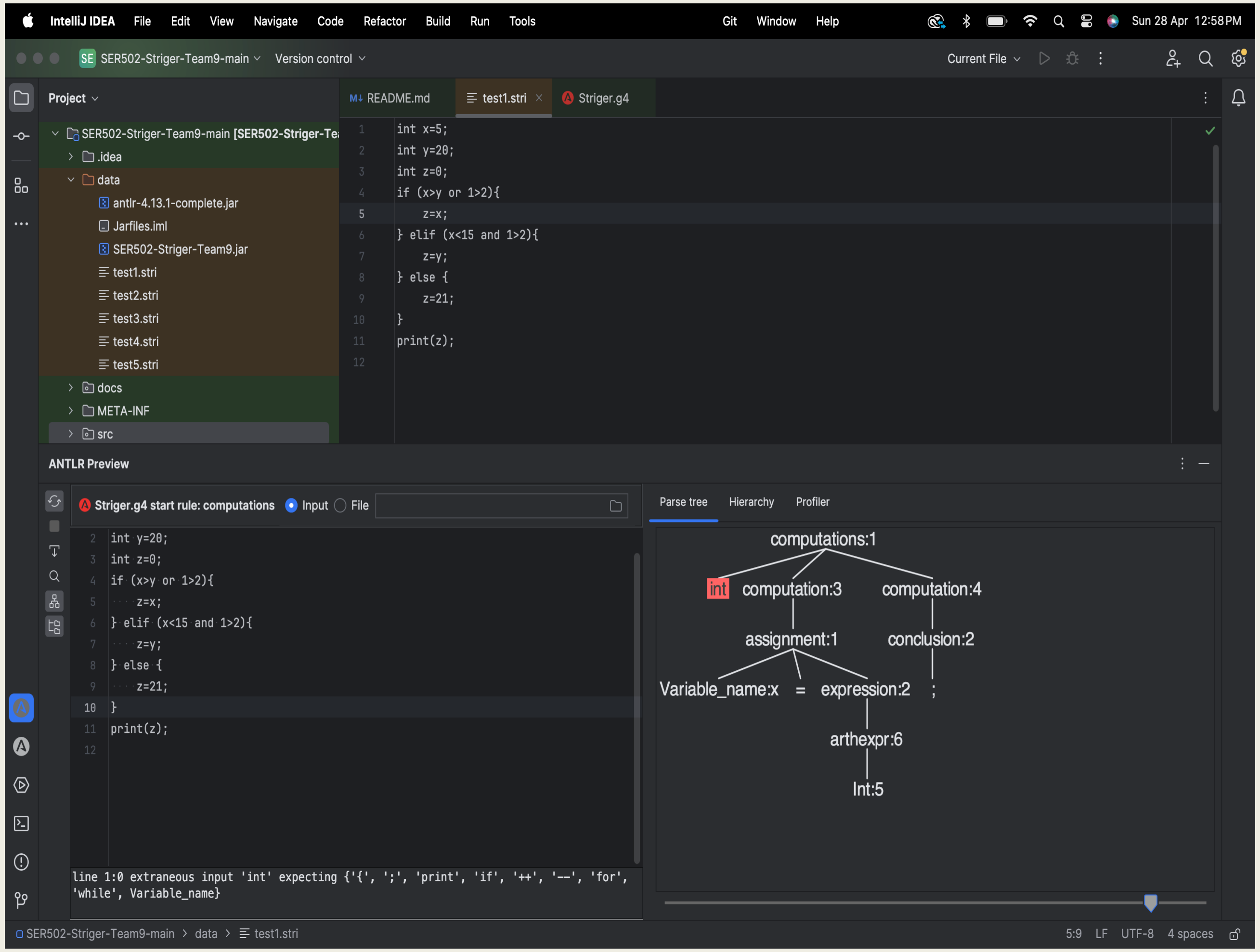
```
boolexpr: 'true'
        | 'false'
        | arthexpr '==' arthexpr
        | 'not' boolexpr
        | boolexpr 'and' boolexpr
        | boolexpr 'or' boolexpr
        | arthexpr '>' arthexpr
        | arthexpr '<' arthexpr
        | arthexpr '>=' arthexpr
        | arthexpr '<=' arthexpr
        | arthexpr '!=' arthexpr
        | '(' boolexpr ')' ;

arthexpr: arthexpr '/' arthexpr
        | arthexpr '*' arthexpr
        | arthexpr '+' arthexpr
        | arthexpr '-' arthexpr
        | Variable_name
        | Int
        | '(' arthexpr ')' ;



Variable_name: [a-zA-Z][a-zA-Z0-9]* ;
Str: '"' (~["])* '"';
Int: [0-9]+;
WHITESPACE: [ \t\n\r]+ -> skip;
COMMENT
    :  '#' ~[\r\n]* -> skip
    ;
LINE_COMMENT
    :   '//' ~[\r\n]* -> skip
    ;
```

Sample Code

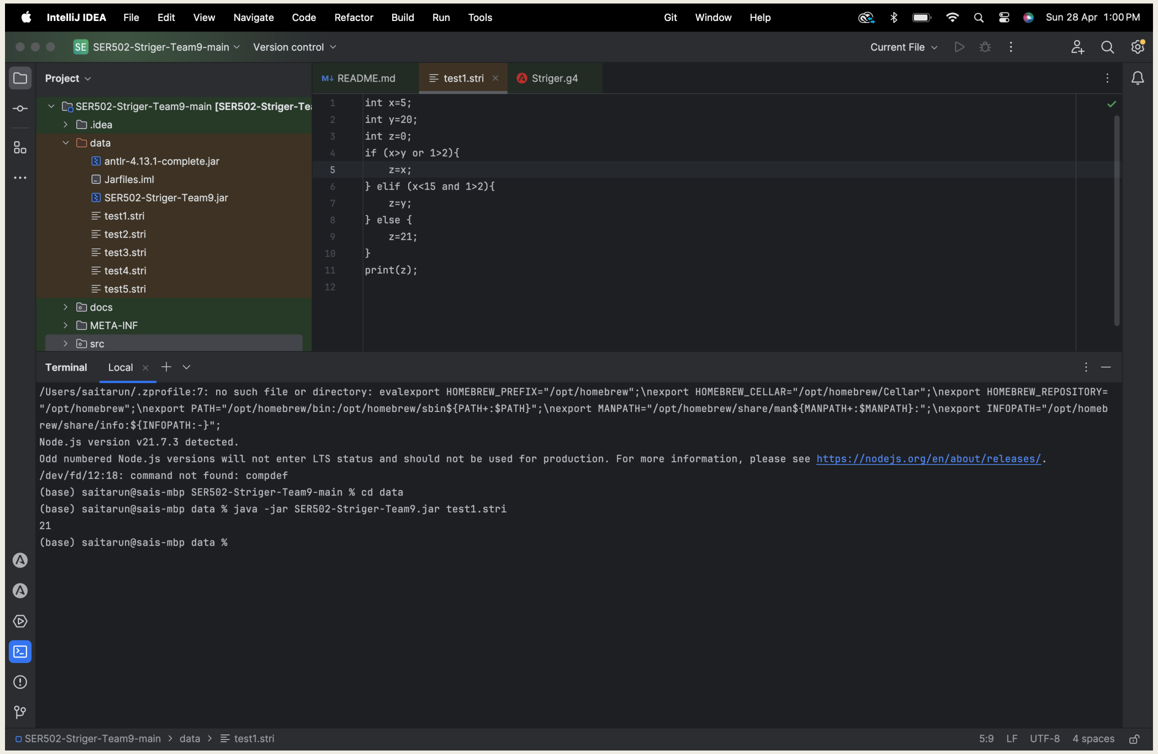
```
int x=5;
int y=20;
int z=0;
if (x>y or 1>2){
    z=x;
} elif (x<15 and 1>2){
    z=y;
} else {
    z=21;
}
print(z);
```

PARSE TREE



```
int x=5;
int y=20;
int z=0;
if (x>y or 1>2){
    z=x;
} elif (x<15 and 1>2){
    z=y;
} else {
    z=21;
}
print(z);
```

```
line 1:0 extraneous input 'int' expecting {'{', ';', 'print', 'if', '++', '--', 'for',
'while', Variable_name}
```

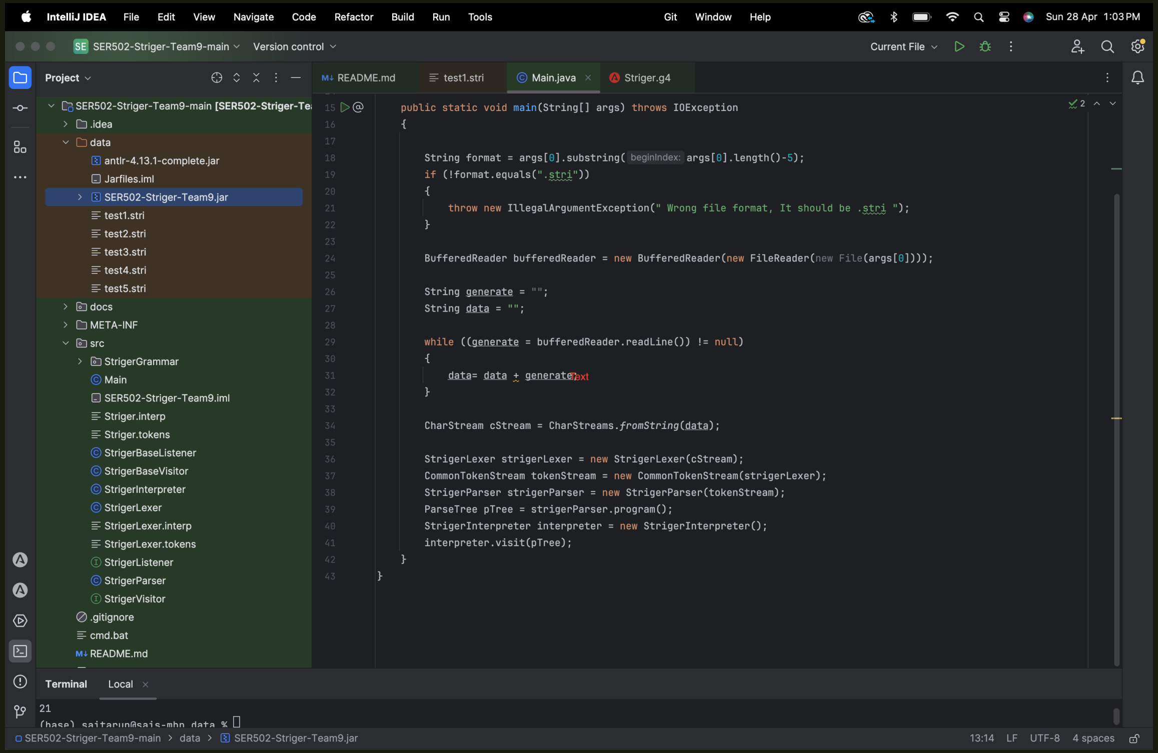


```
int x=5;
int y=20;
int z=0;
if (x>y or 1>2){
    z=x;
} elif (x<15 and 1>2){
    z=y;
} else {
    z=21;
}
print(z);
```

```
/Users/saitarun/.zprofile:7: no such file or directory: evalexport HOMEBREW_PREFIX="/opt/homebrew";\nexport HOMEBREW_CELLAR="/opt/homebrew/Cellar";\nexport HOMEBREW_REPOSITORY=
"/opt/homebrew";\nexport PATH="/opt/homebrew/bin:/opt/homebrew/sbin${PATH+:$PATH}";\nexport MANPATH="/opt/homebrew/share/man${MANPATH+:$MANPATH}:";\nexport INFOPATH="/opt/homeb
rew/share/info:${INFOPATH:-}";
Node.js version v21.7.3 detected.
Odd numbered Node.js versions will not enter LTS status and should not be used for production. For more information, please see https://nodejs.org/en/about/releases/.
/dev/fd/12:18: command not found: compdef
(base) saitarun@sais-mbp SER502-Striger-Team9-main % cd data
(base) saitarun@sais-mbp data % java -jar SER502-Striger-Team9.jar test1.stri
21
(base) saitarun@sais-mbp data %
```

Sample Run and Output

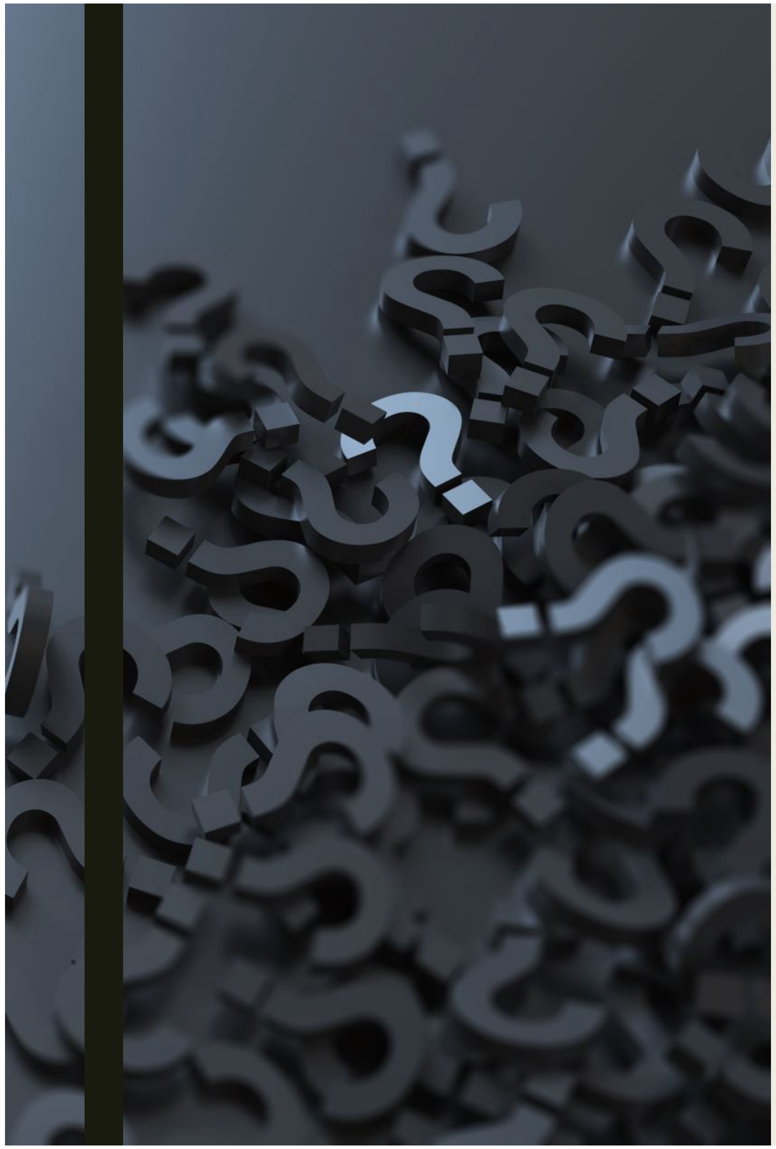
To run the code, the command is
java -jar SER502-Striger-Team9.jar file_name.stri



```java
    public static void main(String[] args) throws IOException
    {

        String format = args[0].substring( beginIndex: args[0].length()-5);
        if (!format.equals(".stri"))
        {
            throw new IllegalArgumentException(" Wrong file format, It should be .stri ");
        }

        BufferedReader bufferedReader = new BufferedReader(new FileReader(new File(args[0])));

        String generate = "";
        String data = "";

        while ((generate = bufferedReader.readLine()) != null)
        {
            data= data + generateText
        }

        CharStream cStream = CharStreams.fromString(data);

        StrigerLexer strigerLexer = new StrigerLexer(cStream);
        CommonTokenStream tokenStream = new CommonTokenStream(strigerLexer);
        StrigerParser strigerParser = new StrigerParser(tokenStream);
        ParseTree pTree = strigerParser.program();
        StrigerInterpreter interpreter = new StrigerInterpreter();
        interpreter.visit(pTree);
    }
}
```

```
21
(base) saitarun@sais-mbp data %
```

INTERPRETER ARCHITECTURE



Future Implementation

- Additional large datatypes like double and long.
- Providing input during run time
- Arrays and lists
- Functions

THANK YOU