CS335A: Assignment 1 (Spring 2023)

Submitted by: Akash Biswas (Roll no.: 200074), Nishant Roshan (Roll no.: 200643)

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1 Development Environment & Language

The program was developed in a system running **Ubuntu 22.04** with **ANTLR 4.11.1** installed. Python language was used to generate the AST from the Java code. The following python packages were used

1. antlr - To prepare AST and do lexical and syntax analysis.
2. argparse - To take and parse argument flags from the command line.

2 Execution Instructions

To install the dependencies

```
$ make req
```

To generate the lexer and parser files from the grammar files

```
$ make
```

To execute and get AST,

```
$ python3 ./bin/main.py --input <input>.java --output <output>.dot
```

Specifying the output file name is optional. By default, the output is written in **out.dot**
Appropriate error messages along with line number and token is displayed on STDOUT.

To generate the postscript file from the dot file, use the following

```
$ dot Tps <output>.dot o <output>.ps
```

Also can pass the -v or –verbose flag to set verbose to true.

3 Sample

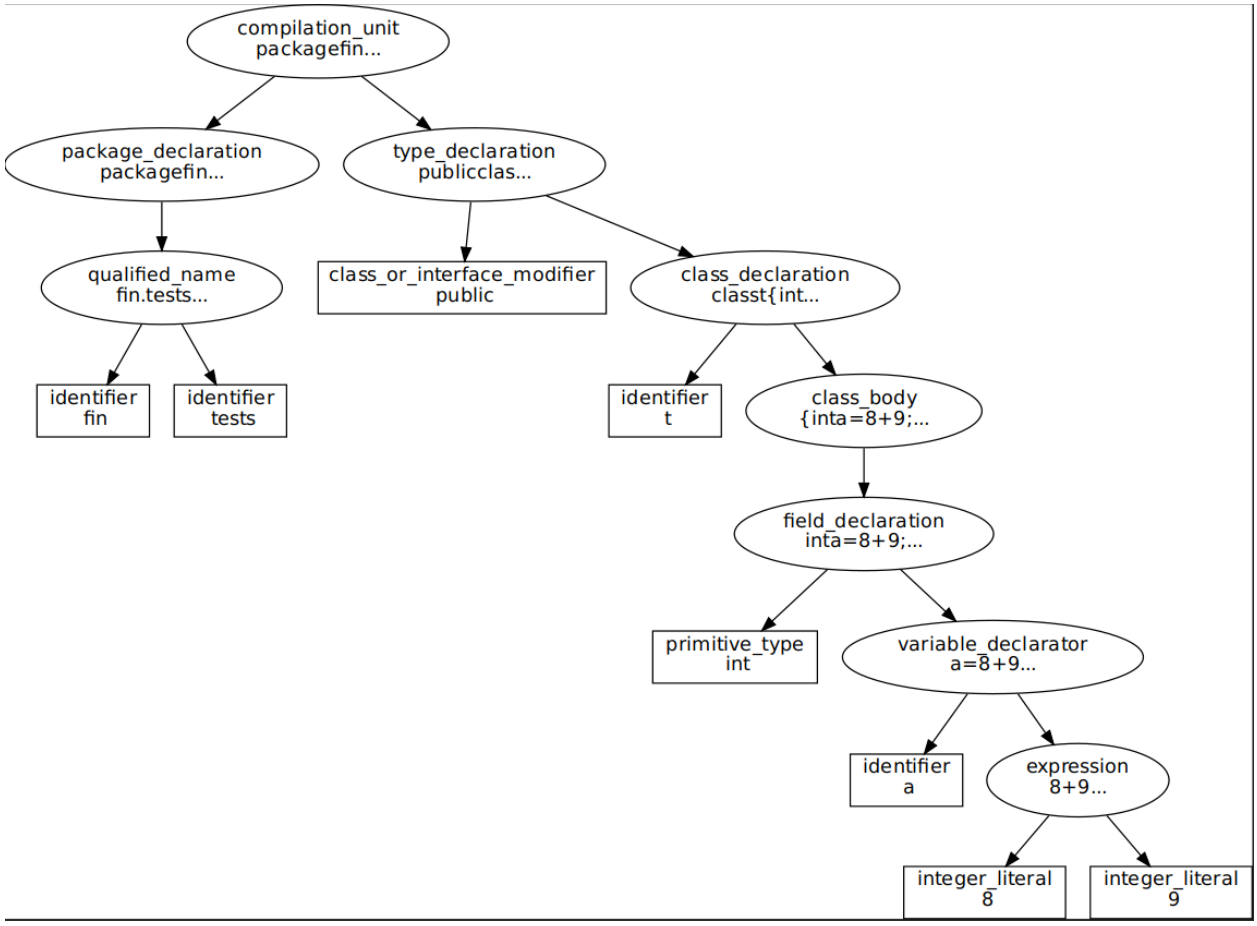
Consider the following sample java program

```
package fin.tests;

public class t {
    int a = 8 + 9;
}
```

The generated parse tree for the above program is presented below.
Note:

1. The terminal nodes are box shaped whereas the rest are curved.
2. The nodes have the non terminals/terminals along with the lexemes. For the non terminal nodes, only first 10 characters are presented so that the parse tree is legible.


compilation_unit
packagefin...
package_declaration
packagefin...
type_declaration
publicclas...
qualified_name
fin.tests...
class_or_interface_modifier
public
class_declaration
classt{int...
identifier
fin
identifier
tests
identifier
t
class_body
{inta=8+9;...
field_declaration
inta=8+9;...
primitive_type
int
variable_declarator
a=8+9...
identifier
a
expression
8+9...
integer_literal
8
integer_literal
9