

CA4003: Compiler Construction

Assignment II : Semantic Analysis and Intermediate Representation

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***Note:*** *Declaration is included as separate file, contained within this submission.*

***Note:*** *No attempt has been made at the Intermediate code generation. However, I briefly mention what I would do and how, given extra time to do so.*

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# 1.1 - The AST

### 1.1.1 - General idea:

* Decorating the entire tree, then removing things that weren’t needed. E.g., removing the “+” binary operator node from the AST.
* Initialising the node values with the image of the token being passed in.
* Changed terminals into non-terminals, to cut down on code duplication. I.e. having lots of “t =” lines.
* On line 465 of the jjt file, the identifier is an example of this.
* Assign child values to decorator nodes. An assign\_op should have two children. The ID and another ID or an ARG\_LIST. That ARG\_LIST should have >0 children. #Node(2) grabbed the 2 nodes behind it and made them their children. #Node(>0) would only be created if there are nodes declared behind this declaration.
* Rewrote some functions to make AST easier to produce. It was also necessary due to the way my grammar is written. Especially expression.
* Replace arithmetic operations and conditions with PLUS\_OP or EQ\_GREATER\_THAN
* Marked out wanted to put things into a Symbol Table.

### 1.1.2 – issues I had

**-** Decorator nodes being ignored. If I had {} #Node(x), the node would not be printed due to the “{}”.

- I couldn’t return the value of a negative identifier. I.e.

### 1.1.3 - What I’m proud of:

## 1.2 - AST Resources

# 2.1 - Symbol Table

## 2.2 - Symbol Table Resources

# 3.1 - Semantic checks

## 3.2 - Semantic checks Resources

# IR Code Generation