**Software Design:**

**The assignment has been executed on Eclipse ID.**

For this assignment our program flow is as follows:

The scanner reads the input line by line and sends each token to the parser.

Parser would check if the input is whether a procedure definition or procedure execution.

* If the input is procedure definition, the tokens are sent to the intermediate package.

The intermediate package will create the symbol tables, build the intermediate tree and link proper references between the symbol tables and intermediate tree nodes.

* If the input is procedure execution, parser check for any compilation errors.

If there are no compilation errors, then the execute.java is invoked to carry out the execution.

* The execute gets the reference to the lambda node of the procedure to execute from the top level symbol table.
* Execute Parse the input and assign each variable to corresponding lambda variable
* Runtime stack has been maintained to get the current value of the variable.
* call processNode method (This method is the main method for processing the binary tree for each node). It processes each node and evaluate the various conditions.
* All the conditions have been defined in the processNode function
* based on the conditions different functions are called.
* variables value during recursive call has been handled using the runtime stack.

**Design Issues:**

There are many conditions to check for which is making the code lengthier and more complex with so many nested conditions and loops.

**The main problem I faced was determining the return type of the parameters.**

In scheme all the conditions are not same. So generalizing the program for all the inputs was also very complex and difficult to handle.

One very strange issue I face that remove-last works perfectly fine when I try to execute it through eclipse. How ever when I try to execute it through terminal using an input file then sometimes I get classCast exception.