CSE-341
Programming Languages

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$START -> $EXP | SFUNCTION | OP_OP KW_EXIT OP_CP

SEXP -> OP_OP OP_PLUS $EXP $EXP OP_CP | OP_OP
OP_MINUS $EXP $EXP OP_CP |
OP_OP OP_MULT SEXP SEXP OP_CP |
OP_OP OP_DIV SEXP SEXP OP_CP |
OP_OP IDENTIFIER SEXP |
OP_OP IDENTIFIER $EXP $EXP |
OP_OP IDENTIFIER SEXP $EXP $EXP|
IDENTIFIER | VALUEF

(def IDENTIFIER $EXP) |
$FUNCTION -> (def IDENTIFIER IDENTIFIER ŞEXP) (def
IDENTIFIER IDENTIFIER IDENTIFIER $EXP)

In this assignment we need to implement interprter which can check the input that is obey the CFG rules, if it obeys the rules then we need to evaluate the input.

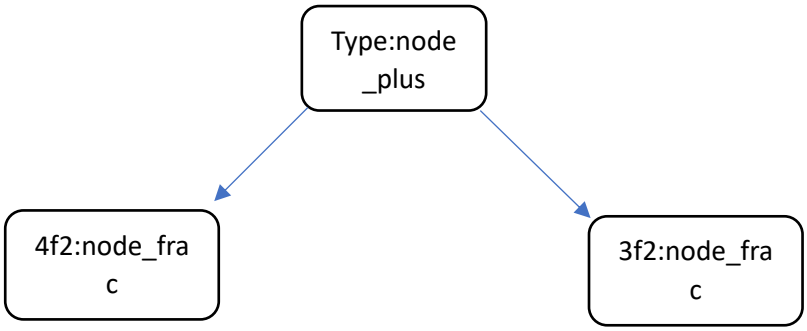
Assignment consist of 2 part. First part is implement yacc file to parsing.

Yacc files apply shihf reduce operations on tokens to check input obey the rules or not. I add AST to this shift reduce operations.I have defined a ASTNode structure.Then I perform parsing operations on input and build AST with this input.if input obey the rule I evaluate the node.

For instance if user enter input like below

“(+ 4f2 3f2)”

Firsty I create 2 node which are hold 4f2 and 3f2 with their type. Then I connect them to operator and reduce this input the exp. When reducing acces the start rule I evaluate below tree:



I use this AST all of the implementation.When user define the funciton

I store the function name, parameters and function body.

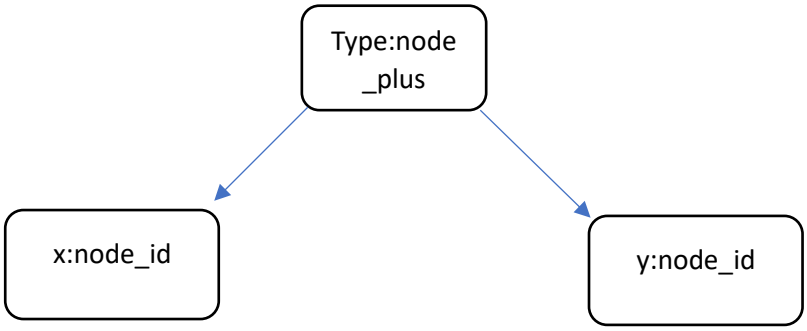
“def sum x y (+ x y)”

For instance if user enter input like above , ast and data stores will be like below

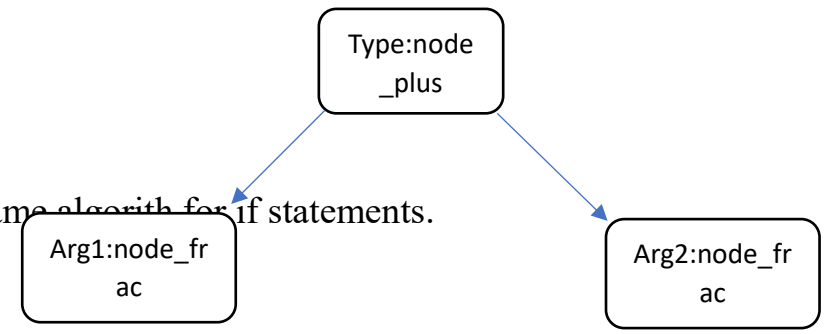
Funciton name: sum

Function parameters : x,y

Function body:



When user call the function code searcch the function by it’ s name and return body of the function.Then code substiute identifier with arguments. Seems of the AST will be like below aftre substitude



I use same algorith for if statements.

CFG of the is below

OP_OP KW_IF exp exp exp OP_CP

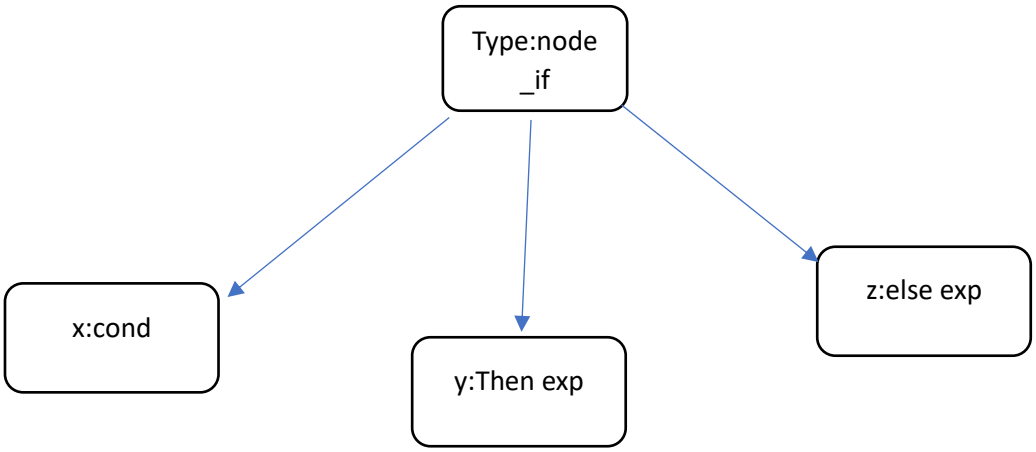
(if (condition) (then exp)(else exp))

I Have added one condition checking if statement. It is enough to show to code work correctly

Conditon operator is less

U can create conditon only less operator

AST of the if is the below:



When user create if statetement , firstly condition is evaluated then returned correct expression by the result of the condition.

Some Rules are ignored which are provided the pdf. For instande user can define function that has 3 paramter bu it is not possible to call funciton with 3 argument therefore I have handled function which has 2 paramter and can called by 2 argument.

I applied same algorithm in lisp code. Lisp code can not perform shift-reduce parcing , therefore I implemented shift-reduce parcing algorithm as well.Rest of the algorithm is same as algorithm that performed in yacc file