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HW5. program → MAIN LPAREN RPAREN LCURLY list RCURLY

Translation rules

program.trans = list.trans

Question 1:

list → list oneItem list1.trans = list2.trans ∪ oneItem.trans
| epsilon list.trans = {}

oneItem → decl oneItem.trans = decl.trans
| stmt oneItem.trans = stmt.trans

(4)

decl → BOOL ID SEMICOLN decl.trans = {}
| INT ID SEMICOLN decl.trans = {}

stmt → ID ASSIGN exp SEMICOLN stmt.trans = {ID.value} ∪ exp.trans
| IF LPAREN exp RPAREN stmt stmt1.trans = exp.trans ∪ stmt2.trans
| LCURLY list RCURLY stmt.trans = list.trans

exp → exp PLUS exp → exp1.trans = (exp2.trans ∩ exp3.trans) ∪ (exp2.trans − exp3.trans) ∪ (exp3.trans − exp2.trans)
| exp LESS exp
| exp2 EQUALS exp3
| ID exp.trans = {ID.value}
| BOOLLITERAL exp.trans = {}
| INTLITERAL exp.trans = {}

Note
plus, less, equals
use same rule

Check: ① Union set has already considered repeated element, duplicates do not appear. {a,b} ∪ {x,a,b} = {x,a,b}

② I used a stupid way: A, B set

(A∩B) ∪ (A−B) ∪ (B−A) ≡ A∪B

this is completely unnecessary.
sets do not allow duplicates by definition