

## COL 226: Assignment 2

### 1 Language PL0 in ll(1) form

*Program* ::= *Block* .  
*Block* ::= *DeclarationSeq CommandSeq* .  
*DeclarationSeq* ::= *VarDecls ProcDecls* .  
*VarDecls* ::= *IntVarDecls BoolVarDecls* .  
*IntVarDecls* ::= **int** *VarDef* |  $\epsilon$  .  
*BoolVarDecls* ::= **bool** *VarDef* |  $\epsilon$  .  
*VarDef* ::= *Ident VarDef1* .  
*VarDef1* ::= **,** *VarDef* | **;** .  
*ProcDecls* ::= **proc** *Ident Block* ; *ProcDecls* |  $\epsilon$  .  
*CommandSeq* ::= { *Command* } .  
*Command* ::= *AssignmentCmd* ; *Command*  
                  | *CallCmd* ; *Command*  
                  | *ReadCmd* ; *Command*  
                  | *PrintCmd* ; *Command*  
                  | *ConditionalCmd* ; *Command*  
                  | *WhileCmd* ; *Command*  
                  |  $\epsilon$  .  
  
*AssignmentCmd* ::= *Ident := Expression* .  
*CallCmd* ::= **call** *Ident* .  
*ReadCmd* ::= **read**( *Ident* ) .  
*PrintCmd* ::= **print**( *Ident* ) .  
*ConditionalCmd* ::= **if** *BoolExpression* **then** *CommandSeq* **else** *CommandSeq* .  
*WhileCmd* ::= **while** *BoolExpression* *CommandSeq* .  
*Expression* ::= *BoolExpression* .  
*IntExpression* ::= *IntT IntE* .  
*IntE* ::= **+** *IntExpression* | **-** *IntExpression* |  $\epsilon$  .  
*IntT* ::= *IntF IntT1* .  
*IntT1* ::= **%** *IntT* | **\*** *IntT* | **/** *IntT* |  $\epsilon$  .  
*IntF* ::= **~** *IntF1* | *IntF1* .  
*IntF1* ::= *Ident* | *IntLiteral* | ( *BoolExpression* ) .  
*BoolExpression* ::= *BoolF BoolE* .  
*BoolE* ::= **||** *BoolExpression* |  $\epsilon$  .  
*BoolF* ::= *BoolG BoolF1* .  
*BoolF1* ::= **&&** *BoolF* |  $\epsilon$  .  
*BoolG* ::= *BoolH BoolG1* .  
*BoolG1* ::= **=** *BoolG* | **<>** *BoolG* |  $\epsilon$  .  
*BoolH* ::= *BoolI BoolH1* .  
*BoolH1* ::= **<** *BoolH* | **<=** *BoolH* | **>** *BoolH* | **>=** *BoolH* |  $\epsilon$  .  
*BoolI* ::= **!** *BoolJ* | *BoolJ* .  
*BoolJ* ::= *BoolLiteral* | *IntExpression* .