

CSE 302: Compiler Design — Lab 4

BX2 Grammar

```
<program> ::= (<globalvar> | <function> | <procedure>)*  
  
<globalvar> ::= "var" <globalvar-init> ("," <globalvar-init>)* ":" <type> ";"  
<globalvar-init> ::= <variable> ("=" (<number> | <bool>))?  
  
<function> ::= "fun" <variable> "(" <parameter-groups>? ")" ":" <type> <block>  
  
<procedure> ::= "proc" <variable> "(" <parameter-groups>? ")" <block>  
  
<parameter-groups> ::= <parameter-group> ("," <parameter-groups>)?  
<parameter-group> ::= <variable> ("," <variable>)* ":" <type>  
  
<stmt> ::= <vardecl> | <block> | <expr> ";" | <assign> | <print> | <ifelse> | <while>  
          | "return" <expr>? ";"  
  
<vardecl> ::= "var" <varinit> ("," <varinit>)* ":" <type> ";"  
<varinit> ::= <variable> ("=" <expr>)?  
  
<block> ::= "{" <stmt>* "}"  
  
<assign> ::= <variable> "=" <expr> ";"  
  
<print> ::= "print" <expression> ";"  
  
<ifelse> ::= "if" "(" <expr> ")" <block> ("else" (<ifelse> | <block>))?  
  
<while> ::= "while" "(" <expr> ")" <block>  
  
<expr> ::= <variable> | <number> | <bool> | <unop> <expr> | <expr> <binop> <expr>  
          | <variable> "(" (<expr> ("," <expr>)* )? ")"  
          | "(" <expr> ")"  
  
<variable> ::= [A-Za-z_][A-Za-z0-9_]* (except keywords)  
<number> ::= [0-9]+ (must be in range [0, 263])  
<bool> ::= "true" | "false"  
<unop> ::= "-" | "~" | "!"  
<binop> ::= "+" | "-" | "*" | "/" | "%" | "<" | ">" | "&" | "|" | "^"  
          | "==" | "!=" | "<" | "<=" | ">" | ">=" | "&&" | "||"
```