

CSE4061 Compiler Design Assignment I

Language Description

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Grammar

program	→ decls compoundstat
decls	→ decl, decls ϵ
decl	→ int ID str ID real ID
functiondecl	→ fun ID (decls) compoundstat
stat	→ ifstat loopstat assgstat compoundstat
compoundstat	→ { stats }
stats	→ stat stats ϵ
ifstat	→ if (boolexp) stat else stat if (boolexp) stat
loopstat	→ loop (boolexp) stat
assgnstat	→ ID assgnop arithexpr ;
assgnop	→ = *= /= %= += -=
boolexp	→ aritexp boolop aritexp
boolop	→ < > <= >= == !=
logexp	→ aritexp logop aritexp
logop	→ and or
unaryexp	→ unaryop aritexp
unaryop	→ + - ! ++ --
aritexp	→ aritexpr + multexp aritexpr - multexp multexp
multexp	→ multexpr*simplexpr multexpr/simplexpr simplexpr
simplexpr	→ ID INTNUM REALNUM STRING (aritexp)

Lexical Structure

- **Comments:** Comments start with the # character and end with the end of line character.
- **Keywords:** int, str, real, fun, if, else, loop, and, or
- **Identifiers:** An identifier includes only lower case letters or underscores. A keyword cannot be an identifier.
- **Operators:** < | > | <= | >= | == | != | < | > | <= | >= | == | != | and | or
- **Delimiters:** whitespace, tab, newline
- **Numbers:**
 - digit → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
 - intnumber → digit+
 - exponent → E (+ | - | ϵ) digit+
 - fraction → .digit+
 - realnumber → digit+ exponent | digit+ fraction (exponent | ϵ)