

UE16CS354  
CD MINI COMPILER PROJECT  
LANGUAGE: C  
CONSTRUCTS: **If-Else, While Loop**

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**Regular Definitions:**

INTEGER [0-9]+  
OPFR (\.INTEGER)?  
OPEXP ( [Ee] [+ -] ? {INTEGER} )?  
NUMBER {INTEGER} {OPFR} {OPEXP}  
ID [a-zA-Z\_][a-zA-Z0-9\_]\*  
CHAR \' [.\n\t] \'

**Grammar:**

Program → BM Main  
BM → #include <ID.h> BM | DeclrStmt BM | €  
Main → Type main {Stmtnlist}  
  
Stmtnlist → Stmtnlist Stmt | €  
Stmt → DeclrStmt ; | Exprstmt | Selectstmt | Iterstmt | Retstmt | Brkstmt | Compstmt  
  
DeclrStmt → Type Varlist | Type Assignexpr | €  
Exprstmt → Expr ; | ;  
**Selectstmt → if ( Cond ) Stmt | if ( Cond) Stmt else Stmt**  
**Iterstmt → while ( Cond ) Stmt**  
Retstmt → return ; | return Expr ;  
Brkstmt → break ;  
Compstmt → { Declrstmt Stmtnlist }  
  
Varlist → ID | ID , Varlist | ID [ INTEGER ]  
Assignexpr → ID = Cond | ID = {Carr} | ID = {Narr}  
Narr → NUMBER, narr | €  
Carr → CHARACTER, carr | €

$\text{Expr} \rightarrow \text{Var Assignop Expr} \mid \text{Cond}$

$\text{Assignop} \rightarrow = \mid += \mid -= \mid *= \mid /=$

$\text{Cond} \rightarrow \text{Cond} \parallel \text{Andexpr} \mid \text{Andexpr}$

$\text{Andexpr} \rightarrow \text{Andexpr} \ \&\& \ \text{Unaryrelexpr} \mid \text{Unaryrelexpr}$

$\text{Unaryrelexpr} \rightarrow ! \ \text{Unaryrelexpr} \mid \text{Relexpr}$

$\text{Relexpr} \rightarrow \text{Sumexpr Relop Sumexpr} \mid \text{Sumexpr}$

$\text{Relop} \rightarrow <= \mid < \mid > \mid >= \mid == \mid !=$

$\text{Sumexpr} \rightarrow \text{Sumexpr Sumop Term} \mid \text{Term}$

$\text{Sumop} \rightarrow + \mid -$

$\text{Term} \rightarrow \text{Term Mulop Unaryexpr} \mid \text{Unaryexpr}$

$\text{Mulop} \rightarrow * \mid / \mid \%$

$\text{Unaryexpr} \rightarrow \text{Unaryop Unaryexpr} \mid \text{Unaryexpr Unaryop} \mid - \ \text{Unaryexpr} \mid \text{Factor}$

$\text{Unaryop} \rightarrow -- \mid ++$

$\text{Factor} \rightarrow ( \ \text{Expr} \ ) \mid \text{Constant} \mid \text{ID}$

$\text{Type} \rightarrow \text{int} \mid \text{char} \mid \text{float} \mid \text{double} \mid \text{long double} \mid \text{long} \mid \text{long long} \mid \text{long int}$

$\text{Constant} \rightarrow \text{NUMBER} \mid \text{CHAR}$