

Princeton University

COS 217: Introduction to Programming Systems

C Statements

Statement Type	Statement Syntax	Examples
Expression Statement	<i>expression;</i>	<code>i = 5; printf("Hello"); 5; /* valid, but nonsensical */</code>
Declaration Statement	<i>modifiers datatype variable [= initialvalue][,variable [= initialvalue]]...;</i>	<code>int i; int i, j; int i = 5, j = 6; const int i; static int i; extern int i;</code>
Compound Statement (alias Block)	<i>{statement statement ... }</i>	<code>{ int i; i = 5; ... }</code>
If Statement	<i>if (integerexpr) statement; if (pointerexpr) statement;</i>	<code>if (i == 5) { statement; statement; }</code>
Switch Statement	<i>switch (integerexpr) { case integerconstant: statements case integerconstant: statements default: statements }</i>	<code>switch (i) { case 1: statement; break; case 2: statement; break; default: statement; }</code>
While Statement	<i>while (integerexpr) statement while (pointerexpr) statement</i>	<code>while (i < 5) { statement; statement; }</code>
DoWhile Statement	<i>do statement while (integerexpr); do statement while (pointerexpr);</i>	<code>do { statement; statement; } while (i < 5);</code>
For Statement	<i>for (initexpr; integerexpr; increxpr) statement for (initexpr; pointerexpr; increxpr) statement</i>	<code>for (i = 0; i < 5; i++) { statement; statement; }</code>
Return Statement	<i>return; return expr;</i>	<code>return; return i + 5;</code>
Break Statement	<i>break;</i>	<code>while (i < 5) { statement; if (j == 6) break; statement; }</code>
Continue Statement	<i>continue;</i>	<code>while (i < 5) { statement; if (j == 6) continue; statement; }</code>
Goto Statement	<i>goto label;</i>	<code>mylabel: ... goto mylabel; ...</code>

Differences between C and Java:

Expression Statement:

- Java: Only expressions that have a side effect can be made into expression statements
- C: Any expression can be made into an expression statement
- Java: Has `final` variables
- C: Has `const` variables

Declaration Statement:

- Java: Compile-time error to use a local variable before specifying its value
- C: Run-time error to use a local variable before specifying its value

Compound Statement:

- Java: Declaration statements can be placed anywhere within compound statement
- C: Declaration statements must appear before any other type of statement within compound statement

If Statement

- Java: Controlling `expr` must be of type boolean
- C: Controlling `expr` must be of some integer type or a pointer (0 => FALSE, non-0 => TRUE)

While Statement

- Java: Controlling `expr` must be of type boolean
- C: Controlling `expr` must be of some integer type or a pointer (0 => FALSE, non-0 => TRUE)

DoWhile Statement

- Java: Controlling `expr` must be of type boolean
- C: Controlling `expr` must be of some integer type or a pointer (0 => FALSE, non-0 => TRUE)

For Statement

- Java: Controlling `expr` must be of type boolean
- C: Controlling `expr` must be of some integer type or a pointer (0 => FALSE, non-0 => TRUE)
- Java: Can declare loop control variable in `initexpr`
- C: Cannot declare loop control variable in `initexpr`

Break Statement

- Java: Also has "labeled `break`" statement
- C: Does not have "labeled `break`" statement

Continue Statement

- Java: Also has "labeled `continue`" statement
- C: Does not have "labeled `continue`" statement

Goto Statement

- Java: Not provided
- C: Provided (but don't use it!)