Conditional statements

There are two basic kinds of conditional statements in Java: the if statement and the switch statement. However, there are several variations on the basic if statement. This handout provides a quick tour of the types of conditional statements in Java.

The basic if statement

Syntax
if (exp<sub>test</sub>)
stmt<sub>cons</sub>

Example
if (x==4) {
  x++;
}

The if statement evaluates a test expression and then executes a consequent statement if and only if the test expression evaluated to true.

The if-else statement

Syntax
if (exp<sub>test</sub>)
stmt<sub>cons</sub>
el<sub>else</sub> stmt<sub>alt</sub>

Example
if (x==4) {
  x++;
} else {
  x--;
}

The if-else statement evaluates a test expression and then executes a consequent statement if and only if the test expression evaluated to true. If the test expression evaluated to false, the if statement will then execute an alternate statement.

Mutually exclusive choices: if-else-if

Syntax
if (exp<sub>if</sub>)
stmt<sub>c1</sub>
el<sub>else</sub> if (exp<sub>else</sub>)
stmt<sub>c2</sub>
el<sub>else</sub> stmt<sub>alt</sub>

Example
if (x==4) {
  x++;
} else if (x==5) {
  x--;
} else {
  x*=2;
}

An else clause may be followed with another if, to allow executing a statement depending on which of a series of conditions is met first. You may chain as many else-ifs together as you wish, and you may (optionally) close with a single final else clause containing a statement to be executed if none of the if conditions is satisfied. Note that, while the conditions need not be logically mutually exclusive, only one statement will execute.

Case analysis with switch

Syntax
switch (exp) {
case v1:  stmt<sub>1</sub>
case v2:  stmt<sub>2</sub>
...
case vn:  stmt<sub>n</sub>
default:  stmt<sub>alt</sub>
}

Example
switch (x) {
case 4:  { x++; break; }
case 5:  { x--; break; }
default:  { x *= 2; }
}

The switch statement is quite unusual if you think about it--it allows your program to jump into the middle of a block of code at a location determined by the value of an expression.

The switch statement consists of the switch keyword, an expression, and a block of code with several interspersed case labels. A case label consists of the keyword case, a constant integral value (e.g. an int or char), and a colon.

When the switch statement executes, it evaluates the expression and then enters the block of code at the case label with the same value as the expression. Execution falls-through to subsequent labels unless it is terminated by a break statement.