Chapter 6
Loops enable us to do something multiple times.
Loops enable us to execute a statement repeatedly.
There are three kinds of loops, and each is good for different kinds of tasks.
The while loop executes a statement repeatedly as long as some condition is true.
while \((exp)\)  
\(stmt\)
Exercise: write the factorial function with a while loop.

public static long fact(int k) {
    // fill this in
}

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public static long fact(int k) {
    int result = 1;
    while (k > 1) {
        result *= k;
        k--;
    }
    return result;
}
The do-while loop executes a statement \textit{at least once} and then repeatedly as long as some condition is true.
do
   stmt
while (exp);
(Why might we want a do-while loop?)
for loops are often used to iterate through ranges or collections.
(The for loop is the most confusing.)
\textbf{for} (\textit{stmt}_{\text{init}}; \textit{exp}; \textit{stmt}_{\text{iter}}) \\
\textit{stmt}_{\text{body}}
Remember: if, switch, while, do-while, and for are all statements and thus can be nested.
Example statement nesting

```
for(i = 0; i < 5; i++) {
    for(j = 0; j < 5; j++) {
        System.out.println(i + "","" + j);
    }
}
```
Exercise: write the factorial function with a for loop.