Static Methods
Static Method

• A **static method** *(class method)* is a block of code with a name, using which it can be **called** *(invoked)* to perform its computation

• The method “takes over” execution when it is called, until it **returns** to the calling program at the point it was called

• Also known as a routine, subroutine, operation, function, or procedure
Anatomy of a Static Method

```java
private static int distance(
    int a, int b) {
    int d = b - a;
    return d;
}
```
Anatomy of a Static Method

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    int d = b - a;
    return d;
}

The method header includes the method's return type, its name, and its parameter list. The method name and the parameter types comprise the method signature.
Anatomy of a Static Method

```java
private static int distance(int a, int b) {
    int d = b - a;
    return d;
}
```

The *method body* consists of the block of code that is executed when the method is called.
Anatomy of a Static Method

```java
private static int distance(
    int a, int b) {
    int d = b - a;
    return d;
}
```

*private* limits the places from which this static method may be called: only from within this class; *public* here would allow it to be called from other classes, too.
Anatomy of a Static Method

```java
private static int distance(
    int a, int b) {
    int d = b - a;
    return d;
}
```

`int` means the method provides a value of this type to the caller when it returns; `void` here would mean the method provides no value at all.
Anatomy of a Static Method

private static int distance(int a, int b) {
    int d = b - a;
    return d;
}

distance is the name of this static method, which is used when calling it.
Anatomy of a Static Method

```java
private static int distance(
    int a, int b) {
    int d = b - a;
    return d;
}
```

`int a` is the first *formal parameter* of the method, whose initial value is supplied at the point of the call; `int b` is the second formal parameter.
Anatomy of a Static Method

```java
private static int distance(int a, int b) {
    int d = b - a;
    return d;
}
```

`int d` is a *local variable* of the method.
Anatomy of a Static Method

```java
private static int distance(
    int a, int b) {
    int d = b - a;
    return d;
}
```

*return* is a statement that hands control back to the caller; if a value is returned by the method, then an expression after *return* provides this value.
Return Statements

• Every *path of execution* through a method that returns a value *must* end in a return statement with an expression of the return type of the method.

• A method that does not return a value *may* have return statement(s) without any such expression; but by default, it returns to the caller anyway when the method body completes execution.
Resources

• *Java for Everyone*, Chapter 5
  – [https://library.ohio-state.edu/record=b8347056~S7](https://library.ohio-state.edu/record=b8347056~S7)