Methods

• What is a method?
  – Block of code to perform action/function
• When have we seen methods already?
  – Decomposition
• What is the purpose?
  – Reduce
  – Reuse
  – Readability

Generalization

• Does the method make a task more specific or more general?
  – Justification
  – Examples
Parameters

- How does a method access outside variable?
  - Declare Class Constant
  - What if we want to modify x and y?

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3;
        computeSum();
    }
    public static void computeSum() {
        int sum = x*y; //error!!!
    }
}
```

Parameters cont.

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3;
        computeSum(x, y);
    }
    public static void computeSum(int s, int t) {
        int sum = s+t;
        s++;
        t++;
        sum=s+t;
        System.out.println("Sum is: " + sum);
    }
}
```

Parameters cont.

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3;
        computeSum(x, y);
    }
    public static void computeSum(int s, int t) {
        int sum = s+t;
        s++;
        t++;
        sum=s+t;
        System.out.println("Sum is: " + sum);
    }
}
```

• Could s and t be named x and y?
Common Mistakes

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3;
        computeSum(int x, int y);
    }
    public static void computeSum(int s, int t) {
        int sum = s+t;
        s++; t++;
        sum+=t;
        System.out.println("Sum is: " + sum);
    }
}
```

What is wrong?

What if you need the sum value outside the method?

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3;
        computeSum(x, y);
        System.out.println("Sum is: " + sum);
    }
    public static void computeSum(int s, int t) {
        int sum = s+t;
        s++; t++;
        sum+=t;
    }
}
```

How do we get this value?

Returning Values

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3, sum;
        sum = computeSum(x, y);
        System.out.println("Sum is: " + sum);
    }
    public static int computeSum(int s, int t) {
        int sum = s+t;
        return sum;
    }
}
```

Why are ALL these needed?
Common Mistakes

```java
public class ScopeEx {
    public static void main(String[] args) {
        int x=2, y=3, sum=0;
        computeSum(x, y);
        System.out.println("Sum is: "+sum);
    }

    public static void computeSum(int s, int t) {
        int sum = s+t;
        return sum;
        sum++; // Statements after return
    }
}
```

- Forget to capture value
- Forget return type
- Forget return value
- Forget return value
- Statements after return