CIS 1068
Little Bit of Recursion

```
2       public static boolean isEven(int x) {
3           return x%2==0;
4       }
5
6       public static int triple(int x) {
7           return x*3;
8       }
9
10      public static int someFunc(int x) {
11          if (isEven(x)) {
12              return x+1;
13          } else {
14              return triple(x);
15          }
16      }
17
18      public static void main(String args[]) {
19          int x=5;
20          System.out.println(someFunc(x));
21      }
```

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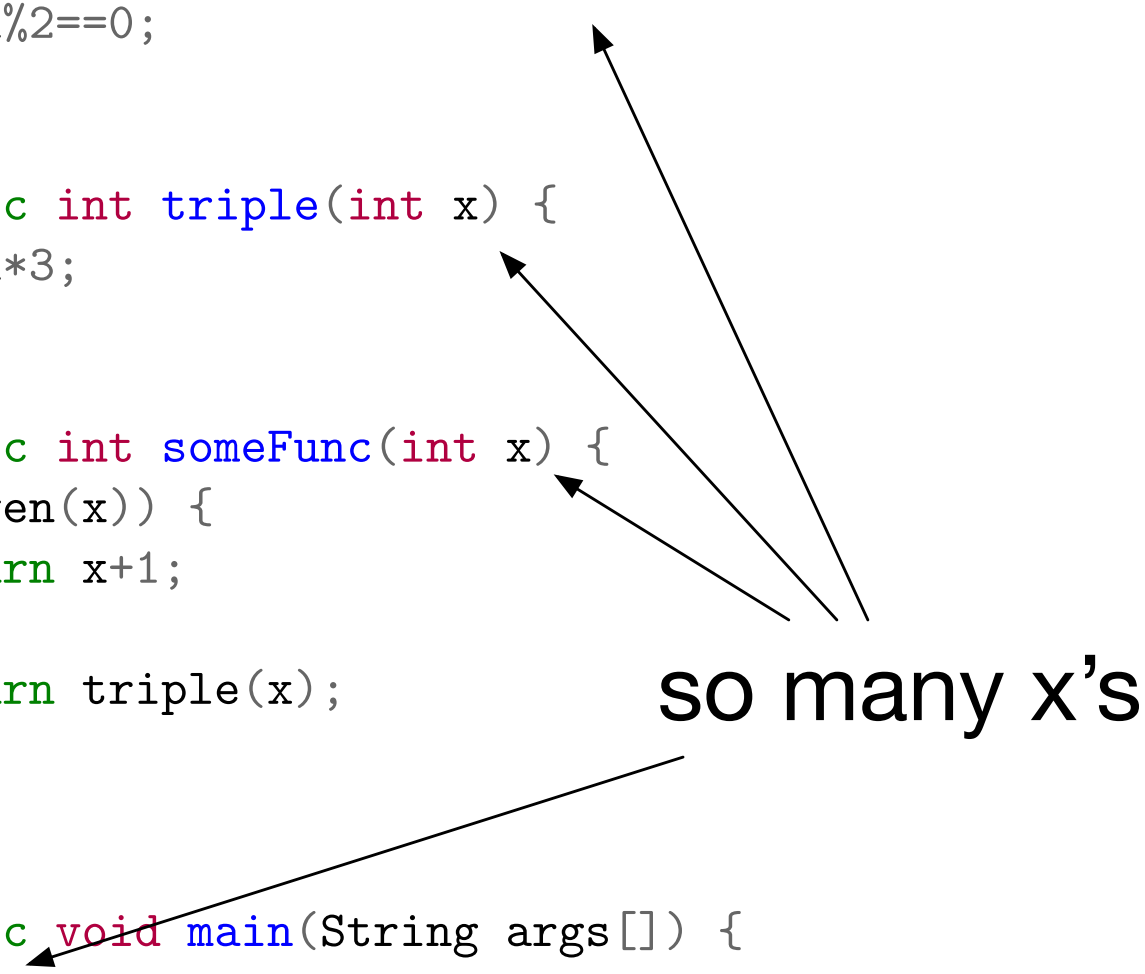

Why is this ok?

Why is this ok? different scope. different vars, same name

What Happens Here?

```
2   public static int f(int x) {
3       if (x==1) {
4           return 1;
5       } else {
6           return 2*f(x-1);
7       }
8   }
9   public static void main(String args[]) {
10      int x = 3;
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```

Is this even legal?

- **Question:** Is it ok for a function to call itself?
- **Answer:** Yes. We call it **recursion**

How Do We Handle This?

It's no different from any other function call you've ever made:

- copy the arguments to the function
- execute the function
- jump back

It's almost as though we did this

(but don't actually recopy the function. This would be an error)

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public static int f(int x) {
    if (x==1) {
        return 1;
    } else {
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public static void main(String args[]
    int x = 3;
    System.out.println(f(x));
}
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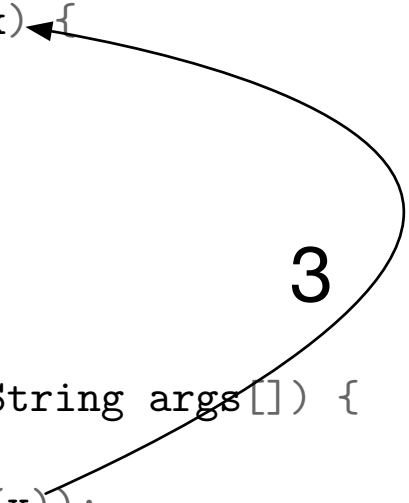

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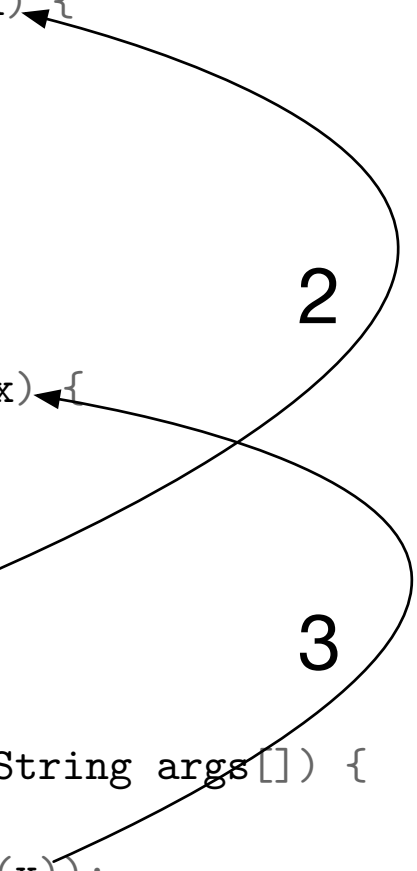

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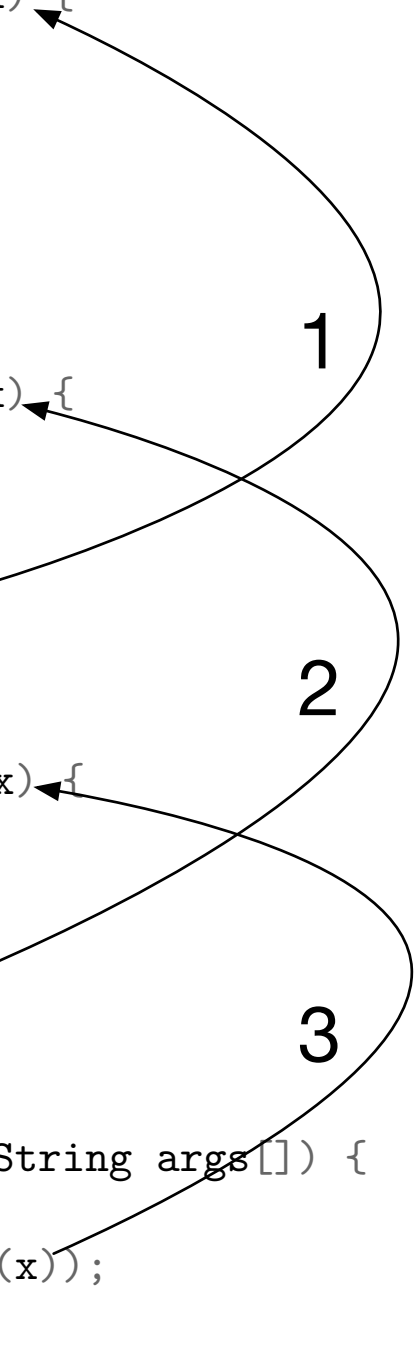

prints 4

Another One

```
1  public class SimpleRecur2 {
2      public static int f(int x) {
3          if (x==1) {
4              return 2;
5          } else {
6              return 2*f(x-1)+1;
7          }
8      }
9      public static void main(String args[]) {
10         int x = 5;
11         System.out.println(f(x));
12     }
13 }
```