

# Assertions

zyBook Chap 5.11

# Assertions

- **Assertion**: A declarative sentence that is **either true or false**
  - May depend on the context
  - Examples
    - When  $x = 13$ ,  $x > 45$  (false)
    - $x$  divided by two equals seven (depends on the value of  $x$ )
- **Provable Assertion**: An assertion that can be proven to be true at a particular point in program execution
  - Help simplify code
  - Understand code better

# Example

TIP: Consider it as  
`System.out.print(x > 3)`  
e.g., at Point A, right above `x--`;

Q: What do we know about the value of x at Point A, Point B, and Point C?

```
if (x > 3) {  
    // Point A: Is x > 3 Always True? Sometimes True? Never True?  
    x--;  
} else {  
    // Point B: Is x > 3 Always True? Sometimes True? Never True?  
    x++;  
}  
// Point C: Is x > 3 Always True? Sometimes True? Never True?
```

**Always**, since it's in the if part, which means the condition `x > 3` is met

**Never**, since it's in the else part, which means the condition `x > 3` is NOT met

**Sometimes**, e.g.,  
If x is 3, x++ in the conditional, and becomes 4  
If x is 4, x-- in the conditional, and becomes 3

**Q:** Identify the various assertions in the anotherSecret method as being either always true, never true, or sometimes true at various points in program execution.

```
public static int anotherSecret(int a, int b, int c) {  
    int temp = c;  
    if( a < b && b < c ){  
        temp = b;  
        b--;  
        // POINT A  
    } else if ( a != c ){  
        // POINT B  
        temp = a;  
        a = c;  
    }  
    return temp;  
}
```

	ALWAYS	NEVER	SOMETIMES
POINT A: <b>a &lt; b</b>			✓
POINT A: <b>a != c</b>	✓		
POINT B: <b>a &lt; b</b>			✓
POINT B: <b>a != c</b>	✓		