ASSERTIONS

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- Assertion: A declarative sentence that is either true or false
  - May depend on context
- Examples
  - When x = 13, x > 45
  - On July 4, 1776 in Philadelphia, it was raining
- Provable Assertion: An assertion that can be proven to be true at a particular point in program execution
  - Help simplify code
  - Understand code better

```java
import java.util.Scanner;

public class NonNegativeNumber {

    public static void main(String[] args) {
        Scanner console = new Scanner(System.in);
        System.out.print("Enter non-negative number: ");
        double number = console.nextDouble();
        while (number < 0.0) {
            System.out.print("That is negative. Try again: ");
            number = console.nextDouble();
        }
        // ASSERT: number is non-negative
        System.out.println("Number: " + number);
    }
}
```

```
$ javac -d bin -cp bin src/NonNegativeNumber.java

$ java -cp bin NonNegativeNumber
Enter non-negative number: -3
That is negative. Try again: -7
That is negative. Try again: 6
Number: 6.0
```

EXAMPLE (Always true (A), Never true (N), Sometimes true (S))

	y < x	y == 0	count > 0
Point A	S	S	N
Point B	A	S	S
Point C	A	A	A
Point D	S	S	S
Point E	N	S	S

```
public static int
  mystery(Scanner console, int x) {
    int y = console.nextInt();
    int count = 0;
    // Point A
    while (y < x) {
        // Point B
        if (y == 0) {
            count++;
            // Point C
        }
        y = console.nextInt();
        // Point D
    }
    // Point E
    return count;
}
```