# Recursion

`OutOfMemoryError`

# Overview

What is It?

- When a method calls itself until a given termination condition is reached
- This termination condition is known as the **base case**

Common Applications

- Sorting algorithms
- Multithreaded applications

# Leading vs. Trailing Statements

The code that comes before a recursive call is known as a **leading statement**, whereas the code that comes after is known as a **trailing statement**.

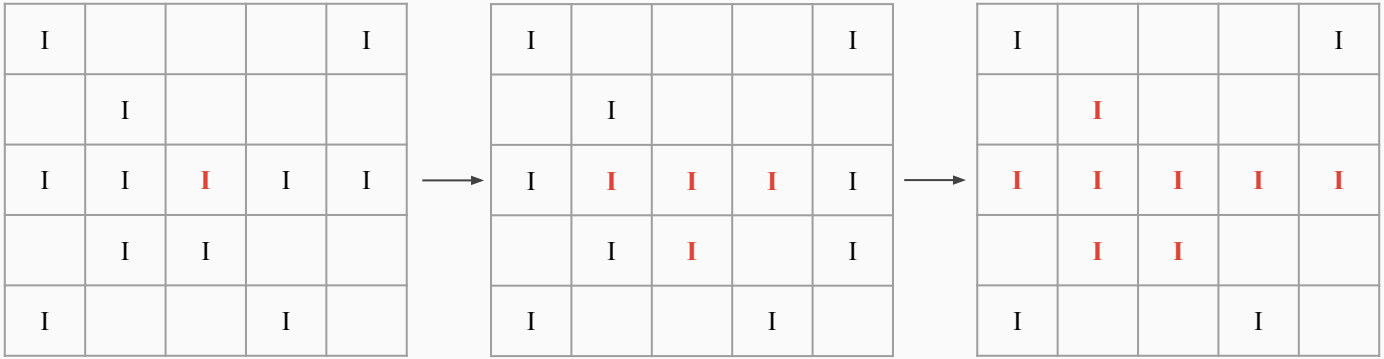
*Example:*

```
public int recursive(){
     //base case (always before recursive call)
     //any amount of code, aka leading statements
     recursive(); //the recursive call
     //any amount of code, aka trailing statements
}
```

# Fibonacci Series Demonstration

# Project: Tree Burning Recursion

- Emulate a forest of grid size (x * y) burning down
- Start at a random point ($x_a$ * $y_b$) and “burn” all surrounding trees
- Stop when all trees have been burned, or there are no more trees next to a burning tree



# Tasks

1. Recurse through and “burn” all trees in a (5 x 5) forest
    a. Make sure that you don’t burn outside the given grid (will result in an error)
    b. Burn only going up, down, left and right (no diagonals)
2. Add support for randomizing the forest
    a. Random forest size
    b. Random tree placement
3. Add support for wind
    a. If wind is blowing from the south, only spread the fire up; if from the south west, then only up and right, etc