

# Standard Recursion, Tail Recursion, Loops

## Important Dates:

- Assigned: September 11, 2024
- Deadline: September 25, 2024 at 11:59 PM EST

## Objectives:

- Students learn to design more complex methods.
- Students understand and describe the differences between standard recursion, tail recursion, and iteration.
- Students understand the direct correspondence between iteration and tail recursive methods.
- Students design methods that call `private` helper methods to solve a problem.

## What To Do:

For each of the following problems, create a class named `ProblemX`, where `X` is the problem number. E.g., the class for problem 1 should be `Problem1.java`. Write (JUnit) tests for each method that you design in corresponding test files named `ProblemXTest`, where `X` is the problem number. Additionally, write Javadoc comments explaining the purpose of the method, its parameters, and return value. **Do not round your solutions!**

*You must write sufficient tests and adequate documentation.*

All problems are listed in *Learning Java - A Test-Driven Approach*. This problem set contains ten required problems, meaning the maximum possible score on this problem set is 100%/100%.

1. Exercise 2.31    [*Palindrome determiner*]
2. Exercise 2.35    [*Hyperfactorials*]
3. Exercise 2.36    [*Subfactorials*]
4. Exercise 2.37    [*Collatz conjecture*]
5. Exercise 2.44    [*ASCII to integer*]
6. Exercise 2.46    [*Wordle recreation*]
7. Exercise 2.48    [*Recreating the substring method*]
8. Exercise 2.51    [*File name comparison*]
9. Exercise 2.58    [*Summing numbers in a string*]
10. Exercise 2.68    [*Rudimentary calculus*]