Indiana University
CSCI-C212: Introduction to Software Systems (F25)
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Loops

What To Do:

Follow each step carefully. As you complete the lab, submit the source files (`.java`) problems to the autograder (link is in the Canvas portal). After finishing, please submit your work to the autograder and let one of the TAs know.
Remember: you must submit your files to the autograder **EXACTLY** as we specify or it will be auto-rejected. Code that does not compile receives a 0 regardless of its style and tests. *Your* unit tests also must compile or we will not accept them.

For this lab, please place each method inside its own class file labeled as `ProblemX`, where `X` is the problem number. The accompanying test files should be named `ProblemXTest`.

Problem 1:

Recall the `isNestedParentheses` problem from the previous lab. Design the `boolean isNestedParenthesesLoop(String s)` method that uses a loop to solve the problem. Remember the translation pipeline!

Problem 2:

Recall the `isFactorion` problem from the previous lab. Design the `boolean isFactorionLoop(int n)` method that uses a loop to solve the problem. Remember the translation pipeline!

Problem 3:

Design the `int chickenCounterLoop(String s)` method, which receives a string *s* and returns the number of times the substring `"chicken"` appears in *s*. You must account for overlapping instances of `"chicken"`. For example, calling the method with `"abcchickechickenn"` returns 2 because, after removing the substring `"chicken"` from the original string, we are left with `"abcchicken"`, which itself contains another instance of `"chicken"`. **Your solution should use a loop and not be recursive**.

(Extra Credit, 25 points) Problem 4:

Design the `boolean isNumberPalindrome(int n)` method that, when given an integer $n \geq 0$, returns whether or not that integer is a palindrome. You cannot convert the number to a string. You may assume that we will not test numbers with leading zeroes, e.g., 000123321. (In Java, this would get truncated to just 123321 anyway.) **Your solution should use a loop and not be recursive**.