Write your name only on the last page where indicated!

CS 101 - Algorithms & Programming I

Fall 2021 - Section 2 Quiz 1

October 22, 2021

1. Sum Divisors

Write a main method returning the sum of all proper divisors of a given (input by the user; do not worry about invalid input) natural number (positive divisors of a number excluding itself). Example: proper divisors of 33 are 1, 3 and 11, totaling 15.

Sample run:

```
Input a natural number: 33
Sum of all proper divisors is: 15
```

```
public static void main(String[] args) {
    Scanner reader = new Scanner(System.in);
    int num;
    System.out.print("Input a natural number: ");
    num = reader.nextInt();

    int sum = 1;
    for (int i = 2; i <= num / 2; i++ ){
        if ( num % i == 0 ){
            sum = sum + i;
        }
    }
    System.out.print("Sum of all proper divisors is: " + sum);
}
```

2. Longest End

Write a main method that takes as input from the user (do not worry about invalid input) a string and returns the longest substring that appears at the beginning and the end of the string, *without* overlapping.

Sample runs:

```
Input a string: abXYab
Longest substring appearing at start/end: ab

Input a string: xx
Longest substring appearing at start/end: x

Input a string: xxx
Longest substring appearing at start/end: x
```

```
public static void main(String[] args) {
    Scanner reader = new Scanner(System.in);
    String str;
    System.out.print("Input a string: ");
    str = reader.next();
    String longest = "";
    String begin, end;

    for (int i = 1; i < str.length()/2+1; i++) {
        begin =  str.substring(0, i);
        end = str.substring(str.length() - i);
        if (begin.equals(end)) {
            longest = begin;
        }
    }
    System.out.print("Longest substring appearing at start/end: " +
longest);
}
```

Name: _____ ID: _____ Signature: _____