

Extra Practice Problems (Module 2)

You may use only features covered until the end of M2

1. Create a function `add-num-to-str` that consumes a string `st` and a positive integer `n` and produces a string by adding `n` to the end of `st`.
Example:

```
(add-num-to-str "CS" 115) => "CS 115"
```
2. Create a function `add-bonus` that consumes two numbers `grade` and `bonus`, where your `grade` is between 0 and 100 and the `bonus` is between 1 and 10. The function produces a new grade not exceeding 100%.
Examples:

```
(add-bonus 98 5) => 100  
(add-bonus 60 4) => 64
```
3. Create a function `sum-digits53` that consumes a positive integer `n` and produces the sum of the digits of `n`.
Examples:

```
(sum-digits53 100) => 1  
(sum-digits53 143) => 8
```
4. Create a function `official` that consumes two strings, `fname` and `lname`, and produces the last name followed by a comma and the initial of the first name followed by a period.
Example:

```
(official "Mbabi" "Tema") => "Tema, M. "
```
5. Create a function `introduction` that consumes one string `fname` and produces an introductory sentence.
Example:

```
(introduction "Bettina") => "Hello, my name is  
Bettina"
```
6. Create a function `sodd?` that consumes a string `s` and produces `true` if the length of `s` is odd and `false` otherwise.
Examples:

```
(sodd? "CS") => false  
(sodd? "uni") => true
```

7. Write the Purpose, Contract (& requirements), Examples and Tests of the following two functions (i.e. part a and b):

a.

```
(define (root-plus a b c)
  (/ (+ (* -1 b)
        (sqrt (- (sqr b) (* 4 a c))))
     (* 2 a)))
```

b.

```
(define (root-minus a b c)
  (/ (- (* -1 b)
        (sqrt (- (sqr b) (* 4 a c))))
     (* 2 a)))
```

- c. Write a function `x-values` that consumes three numbers (`a`, `b`, `c`) and produces a string in the following format:

"For $ax^2 + bx + c = 0$, the values of x which are the solutions of the equation are **x-value1** and **x-value2**."

Note: Where **x-value1** is the bigger root of the equation and the **x-value2** is the smaller root.

Example:

```
(x-values 1 2 -15) => "For  $1x^2 + 2x + -15 = 0$ , the
values of  $x$  which are the solutions of the equation
are 3 and -5."
```

Hint: Use the function `number->string` to convert numbers to strings

8. Write a function `pad3` that consumes a natural number `n` and produces a `Str`. The produced `Str` contains the most left 3 digits of `n`. For `n` that has less than 3 digits, zeros are added at the left to make it of length 3.

Examples:

```
(pad3 7) => "007"
(pad3 42) => "042"
(pad3 245) => "245"
(pad3 3141592) => "314"
```