

Lab 2

Thursday, September 21, 2023

The functions you need to complete in this lab **must be implemented using recursion**. Do not use global (or static) variables.

You will get 1 point for attending the lab, making an effort to work on the problems, and **discussing your work with a lab instructor during the lab**.

If you finish during the lab, demonstrate your working code to a lab instructor and they will give you the full 2 points. If you do not finish during the lab, discuss what you've done with a lab instructor and they will give you an opportunity to finish outside of the lab and attend office hours to demonstrate your solution.

Practice Problems. The teaching assistants will solve these problems if requested. Complete the implementations of the following functions and use `assert` in `main` to provide at least five tests per function including edge cases.

```
// all_digits_even(n) returns true exactly when all decimal digits of n are even
// requires: 0 <= n < 10^9
bool all_digits_even(int n);

// digit_sum(n) returns the decimal sum of the digits in n
// requires: 0 <= n < 10^9
int digit_sum(int n);
```

Assessment Problems. The lab instructors will provide help implementing the following functions but will not provide code for them directly. Each function is 0.5 marks.

```
// first_digit(n) returns the first decimal digit of n
// requires: 0 <= n < 10^9
int first_digit(int n);

// double_digits(n) returns the number consisting of the decimal digits of n
// doubled, so 123 becomes 112233
// requires: 0 <= n < 10^4
int double_digits(int n);
```

Provide at least five tests per function (including edge cases) using `assert` in `main`.