Wesleyan University, Fall 2023, COMP 211

Lab 5: Recursion

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1. Overview

The goal of today's lab is to get some experience writing recursive functions. To that end, you'll implement solutions for several small problems using recursion. For today's lab, you should create a new directory `lab5` in your `labs` directory to hold your code.

Before starting to program, I recommend working out on paper a solution first. You should think about what the base case is and what the recursive case is for each problem.

2. Recursive string length computation: len.c

Your goal here is to write a program that prompts the user to enter a string and then prints the length of the string. You should write your own string length function, `len`, using recursion to compute the length of the string. You should not use any functions from `string.h`.

3. Recursive modulo: `mod.c`

Your goal here is to write a program that prompts the user to enter two numbers `a` and `b` and then performs the modulo operation, `a mod b`, to find the remainder after dividing `a` by `b`. You should write your own modulo function, `mod`, using recursion. You should not use `C`'s modulo operator, `%`. You should assume that `a` and `b` are positive integers. You should return 0 if `b`, the divisor, equals 0.

Challenge: how would you extend your solution to work with negative numbers?

4. Recursive binary search

Rewrite your binary search code for Problem 2 on Homework 4 to use recursion rather than iteration. Note that for Homework 5, you will rewrite the unimodal search code to solve Problem 3 of Homework 4 to use recursion.