

## Discrete Math & Functional Programming— CSCI 054— Spring 2024

Instructor: Osborn

Homework 2 - groupwork (1 point(s))

Due: 10:00PM on Friday

- Please work on these questions at the start of your group’s meeting time. Once you have something you’re comfortable submitting (note that we are evaluating based on effort+participation, not correctness!) you can use the remainder of the hour (i.e. the time during which your group mentor will be available) however you’d like: you can ask conceptual questions, start to work on the assignment in your problem set pairs, etc.
- The person that you designated in last week’s group assignment should upload the responses as a single file to gradescope (making sure to add all the other group members who were in attendance on the submission!).

### 1. [.25 point(s)] Types, lists

Write the following functions. Discuss with your group whether it makes the most sense to use a guard or pattern-matching or a combination of both.

- (a) A function `count` that takes as input a list and a value and counts the number of times that value occurs in the list. Your function should work for lists containing any type of element. Start by deciding what the type of the function should be. Write the function once using list recursion and once using a list comprehension.
- (b) `interleave :: [a] -> [a] -> a -> [a]`, which takes two lists and a padding element. The function returns a list that interleaves the elements of the two lists, using the padding element to fill in the shorter list if the two lists have different lengths.

For example, `interleave "ab" "cdef" 'Z'` should evaluate to `"acbdZeZf"` and `interleave [1,2] [3,4] 5` should evaluate to `[1,3,2,4]`.

- (c) `interleave' :: [a] -> [a] -> [a]` which does the same as above except that it uses the first element of the shorter list for padding. If either list is empty then it should give an error.

### 2. [.25 point(s)] Types and week02-ps

Look through the week02-ps-coding problem set due on Sunday and discuss what the type of each function should be. **Note that you may not discuss what the actual code for the function should be as a group. If you want to do that during the group meeting, then your group must break up into your assigned problem set pairs/triples, each of which should work separately.** This is the difference between specification and implementation.

3. **[.25 point(s)] Group experience**

About how long did your group spend working on the first three questions? Does your group have any questions about the material?

4. **[.25 point(s)] Group participation**

(Some questions for discussion; you can turn in responses to any subset of these.)  
Was everyone in the group at the meeting and, if not, who was missing and why?  
What did your group do to ensure that everyone felt comfortable participating and that no one felt excluded or lost? How will you handle a situation where a group member can't attend a particular week's group meeting? (Can they zoom in? Will you include their name in the gradescope submission?)