

UMassAmherst

Manning College of Information
& Computer Sciences

Programming Methodology

Lab 4

Wednesday, September 25, 2024



Weekly Lab Agenda

- Go over reminders/goals
- Review past material
- Work in groups of 2-3 to solve a few exercises
 - Please sit with your group from last week.
- Discussion leaders will walk around and answer questions
- Solutions to exercises will be reviewed as a class
- Attendance taken at the end

Reminders

- Homework 4 is due tonight at 11:59pm
 - Come to office hours for help!
- HW5 will not be released until after the exam.
- Midterm 1 is in one week on March 5th (Wednesday)
 - Start studying early. See past exams and solutions on Canvas.
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Today's Goals

- Iterators
- Mental models

Exercise 1: Iterators

- Write a function that takes two iterators over the same type and returns an iterator which will first exhaust iterator 1, then continue with iterator 2.

```
// concatenate two iterators
function concatIt<T>(it1: MyIterator<T>, it2: MyIterator<T>) {
    // your code here
}
```

Exercise 2

For each line of code: If a value is printed, state the value and describe how it was obtained, including any values used for the result. Otherwise, state what objects (including arrays, not closures or functions) are created (if any), what values are modified and which objects are no longer referenced (if any).

```
1 const mkList = (init, f) => ({
2   next: () => mkList(f(init), f),
3   value: () => init
4 });
5 let cnt = 0;
6 const a = [mkList(0, x => x + 1), mkList(cnt, _ => ++cnt)];
7 const b = a.map(lst => lst.next().next());
8 console.log(b[1].value());
```

Exercise 3: More Iterators

- Write a function that prepends a value to an iterator. That is, return an iterator that will first produce the given value, then continue with the given iterator.

```
function prependIt<T>(v: T, it2: MyIterator<T>): MyIterator<T> {  
    // TODO: Complete this function  
}
```