S0.3: Quiz 2 Preparation

CSci 2041:

Advanced Programming Principles

University of Minnesota,
Prof. Van Wyk,
Spring 2022

Logistics

- Wednesday, March 2
- It is an in-person quiz
- 9:05am, in our classroom (Anderson 310)
- 25 minutes allowed (for last 25 minutes of lecture)
- Bring you UCard and have your student ID# ready
- You may use 1 single-sided 8 1/2" by 11" sheet of handwritten notes.
  No other materials are allowed.
- Recall: lowest score out of the 5 is dropped
- Remaining time on Wednesday used for S2.1 material

Course material covered by the quiz

Slides

- S1.2: OCaml Basics
- S1.3: Higher Order Functions
- S1.4: Expressions, Values, and Evaluation
- S1.5: Inductive Types and Values (just the basics)

Other material

- Sample functions written in class: `getting_started.ml`, `lists_tuples.ml`
- Techniques used in Hwks 01, 02, Labs 02, 03, 04, 05, and 06

Reading in textbook

- Chapter 1
- Chapter 2
- Chapter 4

Description of course content covered by the quiz

Functional programming language features

- functions (recursive and non) over simple types such as integers and strings
- computations over lists and tuples, pattern matching of these values
- lambda-expressions, curried functions, higher order functions
- basic inductive data types, specifically lists or list-like structures.

Concepts

- parametric polymorphism,
- characteristics of strong static type systems
- difference between expressions and values, understanding of process of evaluation

Description of course content covered by the quiz

Programming techniques and patterns from in-class functions and Hwk 01

- arithmetic computations
- functions searching a range of values, *e.g.* `is_square`
- list processing functions:
  - operating on all values (*e.g.* increment all),
  - selecting certain values (*e.g.* find all evens),
  - selecting a single value (*e.g.* find longest string),
  - combining values in a list (*e.g.* sum all integers)
- using higher order functions, such as `map`, `filter`, `fold_left`, and `fold_right` over lists

Format

- Short answer questions - 2 or 3 sentence answers
- Write small functions, syntax needs only be close to OCaml
- Read small functions, explain behavior

Material not covered by the quiz

Slides:

- S0.1: Course Introduction
- S1.1: Whirlwind Tour
- S1.5: Inductive types: higher order programming, fold/reduce functions
- S2.1: Modular Programming in OCaml

Reading in textbook

- Any section not listed above as being covered