

CISC280 - Book material Covered in Midterm Exam 1

Exam Date: Tuesday, October 14, 2008

The exam will cover Chapter 1 and Chapter 2 through half of section 2.2.3. The following list is intended to help clarify what we covered.

1 Building Abstractions with Procedures

1.1 The Elements of Programming

1.1.1 Expressions

1.1.2 Naming and the Environment

1.1.3 Evaluating Combinations

1.1.4 Compound Procedures

1.1.5 The Substitution Model for Procedure Application

1.1.6 Conditional Expressions and Predicates

1.1.7 Example: Square Roots by Newton's Method (do not worry about specifics)

1.1.8 Procedures as Black-Box Abstractions (test will not cover subsections on Local names, and Internal definitions and block structure)

1.2 Procedures and the Processes They Generate

1.2.1 Linear Recursion and Iteration

1.2.2 Tree Recursion (do not worry about the specifics of the counting change example)

1.2.3 Orders of Growth

1.2.4 Exponentiation

1.2.5 Greatest Common Divisors NOT COVERED

1.2.6 Example: Testing for Primality NOT COVERED

1.3 Formulating Abstractions with Higher-Order Procedures

1.3.1 Procedures as Arguments

1.3.2 Constructing Procedures Using λ

1.3.3 Procedures as General Methods NOT COVERED

1.3.4 Procedures as Returned Values

2 Building Abstractions with Data

2.1 Introduction to Data Abstraction

2.1.1 Example: Arithmetic Operations for Rational Numbers

2.1.2 Abstraction Barriers

2.1.3 What Is Meant by Data?

2.1.4 Extended Exercise: Interval Arithmetic NOT COVERED

2.2 Hierarchical Data and the Closure Property – box and pointer notation

2.2.1 Representing Sequences – simple list functions, dotted tail notation, mapping over lists (abstraction)

2.2.2 Hierarchical Structures – functions working on these

2.2.3 Sequences as Conventional Interfaces only through subsection Sequence operations.