Pattern Matching

Nate Foster
Spring 2019

Today’s music: *Let It Go* by Idina Menzel
The exercises ask you to implement several simple functions
Mostly designed to get used to writing (compiling, testing, etc.) code in Ocaml
Also introduces the standard harness we distributed with each assignment (Makefile, check*.sh scripts, etc.)
Staff can give you the “gist” at consulting hours over the next few days.
Due next Friday
Level Up!

- Next week, Anna Fang and other senior members of the staff will begin offering weekly, *optional* enrichment sessions on a variety of topics
  - git
  - Shell tools
  - Makefiles
  - Study strategies
  - Graduate School
- Thursday, Feb 7th @ 7-8pm, Gates 310
Instant Access Textbook

You’ll be writing an essay on this text book... due part-way through the semester.
Textbook vs. lecture

CS 3110

PRIMARY

summary
Search

• Website
• Textbook
• Discourse
Section & lecture attendance

1% about each: incentive not penalty
Review

Previously in 3110:
• Expressions, definitions
• Scope
• Functions

Today:
• Data types for collections: lists, records, tuples
• Pattern matching
<table>
<thead>
<tr>
<th></th>
<th>Homogenous elements</th>
<th>Heterogenous elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed number of elements</td>
<td></td>
<td>Tuples and records</td>
</tr>
<tr>
<td>Unbounded number of elements</td>
<td>Lists</td>
<td></td>
</tr>
</tbody>
</table>
List implementation

- **Immutable**: can't change elements
- **Singly-linked**:  
  - Good for sequential access of short-to-medium length lists (say, up to 10k)  
  - Data structures are tools: none is perfect
- **Terminology**: nil and cons (from Lisp)
- Next lecture: we'll see the implementation
RECORDS
TUPLES
Records vs. Tuples

by name vs. by position
Records and tuples

• New kind of definition: type definition
• New kinds of types: record types, tuple types
## Collections

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</tbody>
</table>

Syntax and semantics: all in the textbook
PATTERN MATCHING
Deconstructing data

Data:

Patterns:
Deconstructing data

Pattern does not match data
Deconstructing data

<table>
<thead>
<tr>
<th>&quot;Andrew&quot;</th>
<th>&quot;CS&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>gpa</td>
<td>3.0</td>
</tr>
<tr>
<td>false</td>
<td></td>
</tr>
</tbody>
</table>

Pattern does match data
Extracts gpa
Upcoming events

• [Now] A0 is out!
• [Thu] Foster OH @ 1:15-2:15 in Gates 432
• [Fri] Recitations 2 & 3 due on CMS

This is incredible.

THIS IS 3110