COMPSCI 1JC3

Introduction to Computational Thinking

Fall 2017

06a Discussion Session

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Admin

- Midterm 1 will be held on Friday at 19:00–21:00 pm.
  - Testing rooms:

    MDCL 1102 (students Aksamit to Khanna).
    MDCL 1105 (students Lenko to Zhou).
  - Review tomorrow instead of discussion session.
- Assignment 1 marks will be posted early next week.
- Office hours: To see me please send me a note with times.
- Are there any questions?

Review

1. Synonym types.
2. Algebraic data types.

Example: BinTree

```
data BinTree a
  = Leaf a
  | Branch (BinTree a) a (BinTree a)
  deriving (Show)

binTreeNodes :: BinTree a -> Integer

binTreeNodes (Leaf _)        = 1
binTreeNodes (Branch s _ t)  =
  (binTreeNodes s) + 1 + (binTreeNodes t)

binTreeSum :: Num a => BinTree a -> a

binTreeSum (Leaf x)        = x
binTreeSum (Branch s x t)  =
  (binTreeSum s) + x + (binTreeSum t)
```

Algebraic Types as Languages

- An algebraic type A defines a new language L of expressions.
  - L is infinite when A is recursive.
- The expressions of L are in a one-to-one correspondence with the values of A.
  - The expressions of L serve as literals for the values of A.
- Functions over A can be defined using pattern matching on the different forms of expressions of L.
  - At least one pattern is needed for each constructor of A.

Requirements (iClicker)

When is a product acceptable?

A. When the developer is happy with the product.
B. When the client is happy with the product.
C. When it performs as intended.
D. When it satisfies its requirements.