Lecture 28:
Matrices -> Strings

CS 51G

Spring 2018

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Announcements

- Exercise 14.4.4

- Lablet this week
  - Several short methods using lists, due Monday night

Defining Matrix

type Matrix⟦T⟧ = {
   at (r: Number, c: Number) -> T
   at (r: Number, c: Number) put (value:T) -> Done
}

- See class defined at
    - http://www.cs.pomona.edu/classes/cs051G/demos/Matrix/Matrix.grace

- Allows you to ignore implementation as list of lists.

- Must provide default value for each slot

Puzzle

- Suppose define:
  - def a:Matrix⟦Number⟧ =
    matrixSize⟦Number⟧(5,3) defaultValue (0)

  - What is result of executing:
    - for (1..5) do {row: Number ->
        for (1..3) do { col: Number ->
          a.at(row,col)put(4*(row-1) + col)
        }
      }

Two-Dimensional Games

- TicTacToe
  - http://www.cs.pomona.edu/classes/cs051G/demos/TicTacToe/TicTacToe.grace

- Fifteen Game
  - http://www.cs.pomona.edu/classes/cs051G/demos/FifteenGame/

Strings

Strings

- Using from the beginning.

- "hello" ++ " there"

- "x is {x}"

- Strings are immutable
  - Operations generate new strings — do not modify old!!

Strings Methods

- Lots of methods — see text Figs 15.14 and 15.15
  - size,
  - indexOf, indexOf()startingAt(),
    - return 0 if not there
  - indexOf()ifAbsent(blk)
    - Executes blk if not there
  - asLower, asUpper,
  - replace()with(),
  - substringFrom()size(), and substringFrom()to()

Word Counts

- Use variants of indexOf method
  - http://www.cs.pomona.edu/classes/cs051G/demos/WordCount/wordCount.grace

Scraping Web Pages

- Google looks for all links ...

- Links all start with "<a " and end with ">"

  - http://www.cs.pomona.edu/classes/cs051G/demos/FindLinks/FindLinks.grace

Questions?