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Administrivia

- Midterm Thursday. Review sheet online.
- Sample solutions for quizzes and homeworks online.
- Homework 4 on the Web. Due in a week.

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Minute Essay From Last Lecture

- Most people were finding the homeworks not-easy enough to be interesting(?). (Good!)
- Several people commented that they learn more from doing the homeworks than from other things. Yes!! "Programming is not a spectator sport."

Collection Methods — Overview

- As noted earlier, both arrays and lists provide a wide range of interesting(?) methods. (“Methods”? Briefly, special type of functions, described a bit in chapter 3.) The textbook lists some of them and is a good starting point. For full details, however . . .

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The Scala API

- In context, API means “Application Programming Interface”. Meant as complete documentation of the language’s library functions, methods, etc. Many languages and libraries have one of these.
- The standard presentation of Scala’s API is descended from that of Java and is nicely organized for online browsing (link from course “Useful links” page). Worthwhile spending a bit of time learning how to find things in it (though not everything will make sense yet).

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The Scala API — Tips/Gotchas

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- Notice — some entries in left frame show two icons (“o” and “c”). “c” shows things you can do with objects of whatever type it is (e.g., `Ints`). “o” shows things you can do with `Int` itself — e.g., get minimum and maximum value.
- Some things are documented in unobvious places (e.g., `ArrayOps`, `StringOps`, `RichInt`).

Collection Methods — Basics

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- Some methods to extract parts of a collection:
`drop`, `init`, `last`, `slice`, `splitAt`, `take`, `takeRight`
- Some methods to test something about a collection:
`contains`, `endsWith`, `isEmpty`, `nonEmpty`, `startsWith`
`indexOf`, `lastIndexOf`
- Some other useful methods and variables:
`foreach`, `mkString`, `reverse`, `zip`, `zipWithIndex`, `length`,
`size`

Collection Methods — Basics Continued

- `sum` and `product` work on objects that support addition and multiplication.
- `min` and `max` work on objects that can be put in order.
- Strings have `split`.

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Collection Methods — Higher-Order Methods

- `exists`, `forall`
- `filter`, `partition`
- `map`
- `reduceLeft`, `foldLeft`

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Examples

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- Right away we have alternatives to most of the functions in our “demo” program. (But that’s okay — they were good practice.)
- A somewhat more interesting example: Find out whether a line of text is a palindrome. Simplest version is, well, simple with `reverse`. If we want to implement the usual definition, though, that looks only at letters and ignores case?
- Another example: Compute variance of elements in an array, where variance of $a_0 \cdots a_{n-1}$ is defined as the average of $(a_i - avg)^2$ (avg is the average of the a_i 's).

Minute Essay

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- Can you think of other interesting things you could do with some of these methods?