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Scala

Collection operations: filter

```
val ints = anyList.map(s => s.toInt).filter(_ % 2 == 0)
```
• The filter operation takes a predicate that returns a Boolean.
• If an element ev
  evaluated items
• In this example
  underscore (_) s
  case, the evalua

Tasked tailored to lectures

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II.II/ Higher order functions in Scala

"Higher order functions", *Scaladoc* explains, "take other functions as parameters or return a function as a result." They are made possible in Scala because they support operations available to others like being passed as an argument, returned from a function, modified and assigned to a variable (i.e. they are first class values).

II.II.a/ The map operation

map takes a predicate and applies it to every element contained within the collection. It's part of the TraversableLike trait, so will work on all different pes of collections.

sk 13: In a val called lengths, use map to create a list that corresponds to the gths of the names in doorClosersList.

I.b/ The filter operation

ilter takes a predicate that returns a Boolean. If an element evaluates to true, it is returned. Falsely evaluated items are filtered out of the result.

Task 14: Write a function lessThanX that takes in a list of strings and a length x. It should return the items that have a length less than the specified integer.

Aims

- To research and present the programming language Scala – what can it do?
- To look at Scala from a teaching perspective:
  - How can it be introduced to newcomers in an accessible fashion?
  - Will the language add to students' understanding of functional programming?
  - Which is the best order to learn the languages Java, Scala, and Haskell?
  - Could Scala be added to or replace Haskell in the CS-205 module?
- To explore the language's security – can it be used for program verification?

Project Overview

- Researched Scala's current use in the teaching sphere
- Investigated differences between Scala, Java and Haskell
- Planned two 2hr lectures and two 2hr lab sessions
- Delivered the introductory lecture twice, online and offline

Findings

- 100% liked Scala
- Most preferred it over Haskell
  - More approachable
  - Thought it should replace Haskell in CS-205
- Java -> Scala -> Haskell √
- Pure and safe

Scala at a glance

- Comes from <u>Scala</u>ble <u>L</u>anguage
- Multi-paradigm (FP & OOP)
- Interoperability with Java
- 12th most active on Stack Overflow
- 4th best paid (2019 developer survey)
- Difficulty is actually mostly perceived
- Use by tech firms (cf. academic Haskell)

Putting the fun into functional programming

Exploring Scala for teaching functional programming and verifying programs