



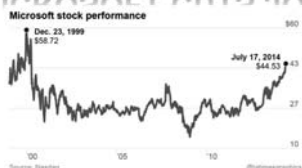
The Beauty and Joy of Computing

Lecture #19 Higher Order Functions



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MICROSOFT CUTS JOBS

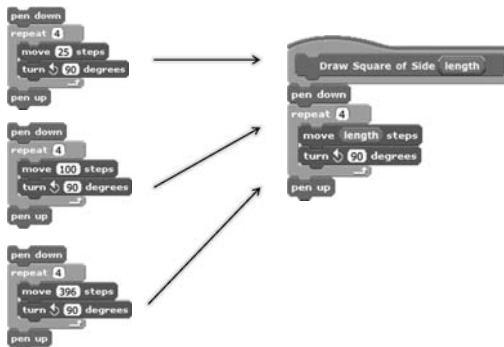


<http://www.latimes.com/business/la-fi-microsoft-layoffs-20140718-story.html>

Microsoft cuts over 18000 jobs, namely at Nokia branch, to incorporate it and revamp their image to compete with Amazon, Google, and Apple.



Why use functions? (review)



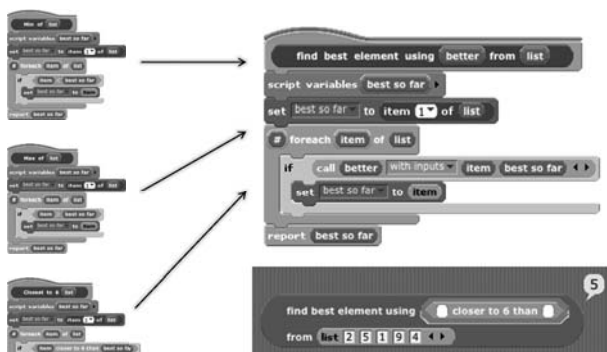
The power of generalization!



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But how general can we be?



The power of generalization!



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Today

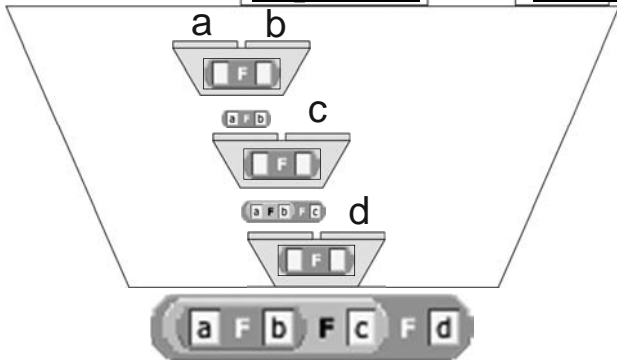
- Functions as Data
- Higher-Order Functions
- Useful HOFs (you can build your own!)
 - map Reporter over List
 - Report a new list, every element E of List becoming Reporter(E)
 - keep items such that Predicate from List
 - Report a new list, keeping only elements E of List if Predicate(E)
 - combine with Reporter over List
 - Combine all the elements of List with Reporter(E)
 - This is also known as "reduce"
- Acronym example
 - keep → map → combine



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combine with Reporter over List



Peer Instruction



I understand higher-order functions.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree



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Summary

- Functions as data is one of the two (programming) big ideas in this course
- It's a beautiful example of the abstraction of the list iteration details
- Google (and other companies) use this!
 - They use "map-reduce"

(Image Credit: *Simply Scheme* by Brian Harvey & Matt Wright)

