



# CS10 : The Beauty and Joy of Computing

## Lecture #18 Higher Order Functions I



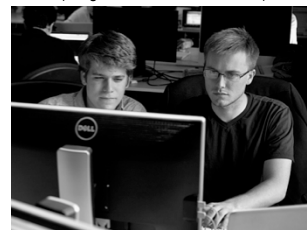
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### CODING IS COOL AGAIN!

The market for classes in coding (esp focused on the Internet) is booming, so says the NY Times. Codecademy is one of the biggest sites; CS10 is a great first step!!

(Image Credit: New York Times)

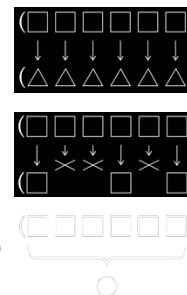


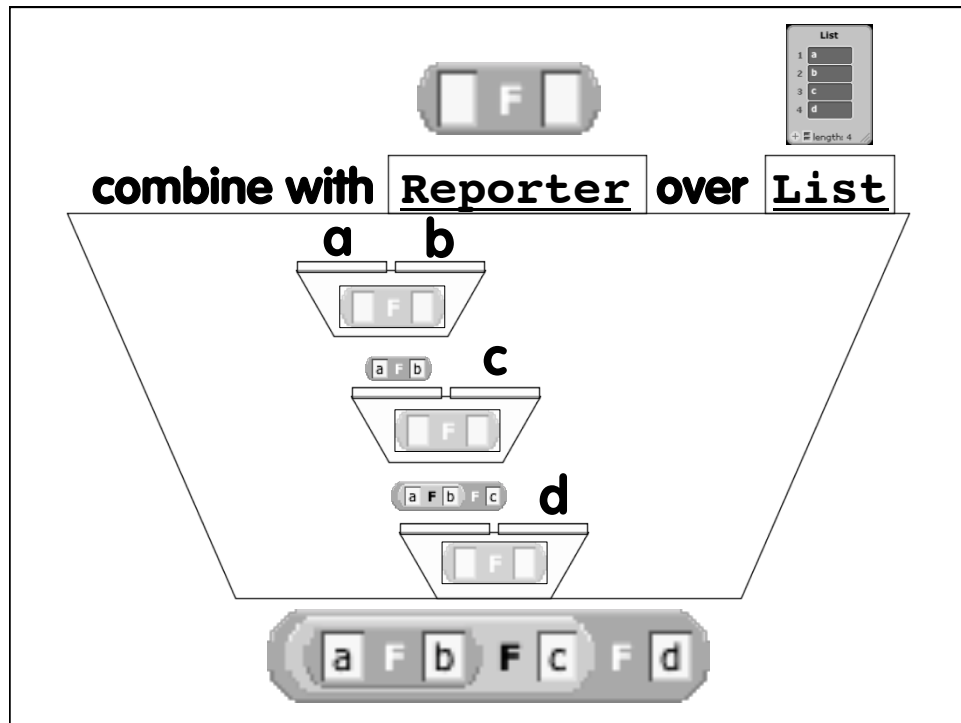
<http://www.nytimes.com/2012/03/28/technology/for-an-edge-on-the-internet-computer-code-gains-a-following.html>



## 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  $\text{Reporter}(E)$
  - keep items such that Predicate from List
    - Report a new list, keeping only elements  $E$  of List if  $\text{Predicate}(E)$
  - combine with Reporter over List
    - Combine all the elements of List with  $\text{Reporter}(E)$
    - This is also known as "reduce"
- Acronym example
  - keep  $\rightarrow$  map  $\rightarrow$  combine





## 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)

