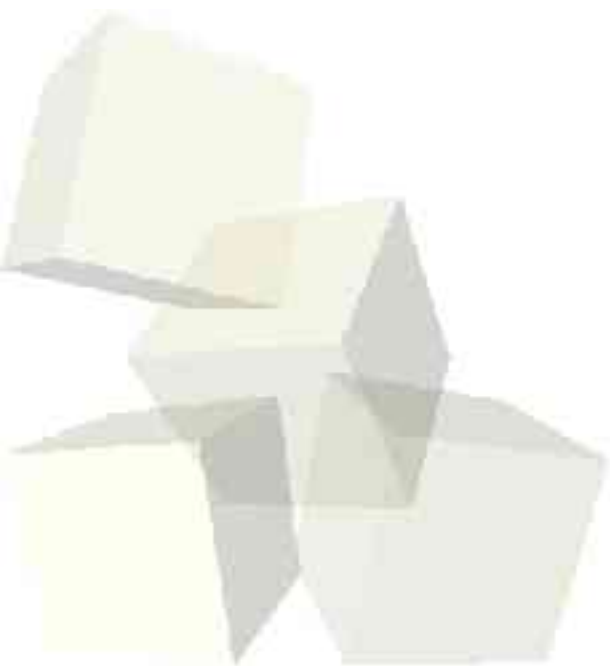




Abstracting Functions 2

9-29-2004





Opening Discussion

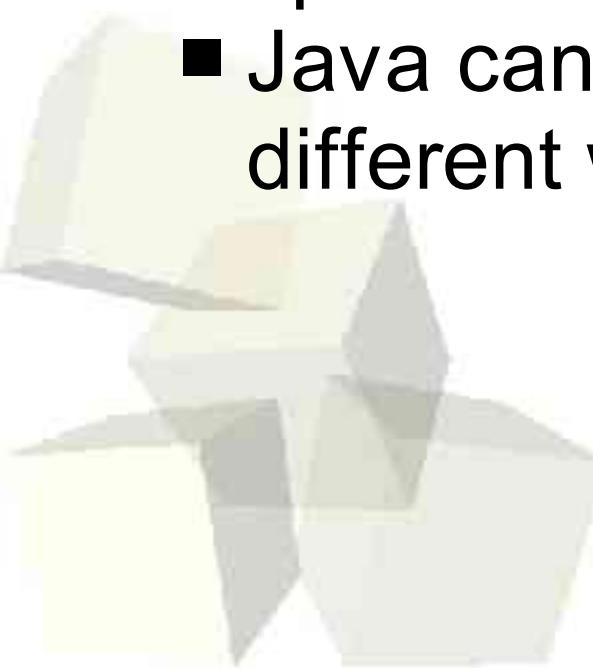
- Do you have any questions about the quiz?
- What were the three interesting things we talked about that you can do with functions in functional languages? What does each one buy us? How can you do these types of things in other languages?






Minute Essay Discussion

- Recursion doesn't require function passing or returning, just calling them.
- Currying in C++ is not at all straightforward. It requires some sophisticated template specialization techniques.
- Java can do these things too, but in a very different way.





Revisiting Currying

- I introduced currying last time, but we should look at the concept a bit more and see how we can use it with recursive functions.
 - Consider some of the two argument list processing functions that we have done before and what they look like when curried.
 - ◆ Member
 - ◆ Remove
 - ◆ Map
- 

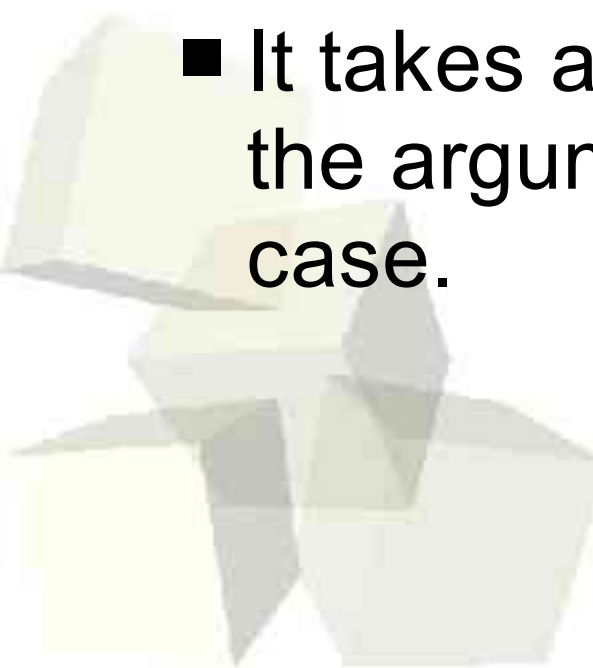


Abstracting Functions to give Flat Recursion

- You might notice that there is a general form to all of these functions. They all define an internal function that returns some basis value when the list is null and applies some function to the car and the return of the recursion on the cdr of the list.
- As a result, we can write an abstract function that takes the seed and the procedure as arguments and returns a function that actually does the processing we want.



Abstracting Functions to give Deep Recursion

- The same type of thing applies to deep recursion. However, in this case we have one extra function because we need one to apply when the car is a list and one when it is not.
 - It takes a bit more thought to decide what the argument functions should be in this case.
- 



Minute Essay

- We won't go through the section on doing object-oriented programming in Scheme, but functional abstraction can clearly give us the same types of abilities as dynamic binding in object oriented languages. Describe how this might work. Remember that an object is just a collection of data and functions together.
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