CS 61A Structure and Interpretation of Computer Programs
Spring 2017

Discussion Quiz 10

1. (5 points) Extreme Stream Supreme (translated from Scheme)

What are the first four values of the stream `s`?

```
def sweet(dreams):
    return Stream(Link(dreams), lambda: sweet(Link(dreams)))

def mix(tape):
    pre = match(lambda x: x.rest, tape.rest)
    temp = pre
    while temp.rest is not Link.empty:
        temp = temp.rest
    temp.rest = Link(tape.first.rest)
    return Stream(tape.first.first, lambda: mix(pre))

def match(dot, com):
    if com is Link.empty:
        return com
    return Link(dot(com.first), match(dot, com.rest))

s = mix(match(sweet, Link(1, Link(2, Link(3)))))
```

2. (5 points) Tree Traversal

Make `BinTree`s iterable! such that if the tree were a binary *search* tree, we would iterate over the values in order of least to greatest. In other words, we want to perform an *inorder traversal*, in which we iterate over the labels on the `left`... followed by the current node's label... followed by the labels on the `right`.

What method(s) do we need to implement?

```
class BinTree:
    empty = ()
    def __init__(self, label, left=empty, right=empty):
        self.label = label
        self.left = left
        self.right = right
```

```
>>> bst = BinTree(5, BinTree(3, BinTree(2), BinTree(4)), BinTree(6))
>>> list(bst)
[2, 3, 4, 5, 6]
>>> for thingy in bst:
...     print(thingy)
2
3
4
5
6
```