CS 61A Spring 2017

Structure and Interpretation of Computer Programs

Quiz 5 Solutions

1. (5 points) LoopList

Implement a class LoopList that has a method at_index. If at_index is called with an index that is too large, the LoopList will loop around back to the beginning.

```
class LoopList:
    """
    >>> x = LoopList([3, 1, 4])
    >>> [x.at_index(i) for i in range(10)]  # loops around!
    [3, 1, 4, 3, 1, 4, 3, 1, 4, 3]
    """
    def __init__(self, lst):
        self.lst = lst

def at_index(self, i):
        return self.lst[i % len(self.lst)]
```

```
2. (5 points) Berkeley Landmark #158
  Draw the environment diagram. (This is very hard!)
  def campa(nile):
       def ding(ding):
           nonlocal nile
           def nile(ring):
                return ding
       return nile(ding(1914)) + nile(1917)
  ring = campa(lambda nile: 100)
                             Frames
                                            Objects
  Global frame
                                            func campa(nile) [parent=Global]
                      campa
                                            func ding(ding) [parent=f1]
                              2014
                        ring
                                            > func nile(ring) [parent=f2]
  f1: campa [parent=Global]
                        ding
                      Return
                              2014
                       value
  f2: ding [parent=f1]
                        ding
                      Return
                              None
                       value
  f3: λ <line 8> [parent=Global]
                        nile
                             None
                      Return
                              100
                       value
  f4: nile [parent=f2]
                        ring
                              1917
                      Return
                       value
```