

## 1 Sixty-one

- 1.1 You have been hired by Alan to help design a priority queue implementation for *Kelp*, the new seafood review startup, ordered on the timestamp of each *Review*.

Describe a data structure implementation that supports the following operations.

- `insert(Review r)` a *Review* in  $O(\log N)$ .
- `edit(int id, String body)` any one *Review* in  $\Theta(1)$ .
- `sixtyOne()`: return the sixty-first latest *Review* in  $\Theta(1)$ .
- `pollSixtyOne()`: remove and return the sixty-first latest *Review* in  $O(\log N)$ .

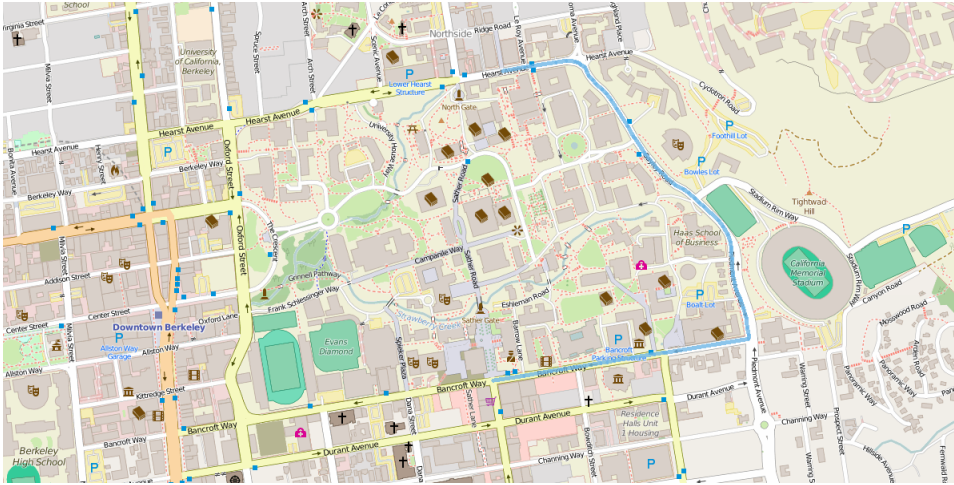
- 1.2 Give the *amortized runtime analysis* for push and pop for the priority queue below.

```
class TwinListPriorityQueue<E implements Comparable> {
    ArrayList<E> L1, L2;
    void push(E item) {
        L1.push(item);
        if (L1.size() >= Math.log(L2.size())) {
            L2.addAll(L1);
            mergeSort(L2);
            L1.clear();
        }
    }
    E pop() {
        E min1 = getMin(L1);
        E min2 = L2.poll();
        if (min1.compareTo(min2) < 0) {
            L1.remove(min1);
            return min1;
        } else {
            L2.remove(min2);
            return min2;
        }
    }
}
```

## 2 From humble beginnings

```
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("hello world");  
    }  
}
```

## 3 To where we are now



## 4 And what lies ahead

- 61C Machine abstractions and optimizing programs in the real world. My favorite lower-division course: it'll change the way you think about data structures.
- 70 Mathematical rigor and learning more than you knew you could ever learn.
- 152 Like CS 61C, but turned up to 11. More analysis and open-ended projects.
- 161 Security: from social engineering & cost-benefit analysis to theory & crypto.
- 168 Network systems and Internet architecture. Scott Shenker cares so much about you that you won't even mind that the content is very dry and uninteresting.
- 170 Graph algorithms and techniques for problem solving like divide-and-conquer.
- 184 Databases like project 2, but with more of an interest in performance.
- 188 Artificial intelligence: assignments are fun, but *don't underestimate the exams!*
- 194-26 Computational photography, or the best class you'll take your senior year.
- 195 Ethics course. Spend another semester having fun with John, Josh, and Dan!
- 197 Academic interning for CS 61B.
- 198 Computer Science Mentors for CS 61B.
- 370 Intro to Teaching Computer Science with Chris Hunn, the best person ever.