

## Homework 3

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```
/**
 * Smooths a given {@code Sequence<Integer>}.
 *
 * @param s1
 *         the sequence to smooth
 * @return
 *         the resulting sequence
 *
 * @requires |s1| >= 1
 * @ensures <pre>
 * |result| = |s1| - 1 and
 * for all i, j: integer, a, b: string of integer
 *     where (s1 = a * <i> * <j> * b)
 *     (there exists c, d: string of integer
 *         (|c| = |a| and
 *         result = c * <(i+j)/2> * d))
 * </pre>
 */
```

1) **public** Sequence<Integer> smooth(Sequence<Integer> s1) {...}

2) Iterative

```
public Sequence<Integer> smooth2(Sequence<Integer> s1) {
    Sequence<Integer> result = new Sequence1L<Integer>();

    for(int i=0; i<s1.length()-1; i++) {
        s1.add(i, (s1.entry(i)+s1.entry(i+1))/2);
    }

    return result;
}
```

Recursive

```
public Sequence<Integer> smooth3(Sequence<Integer> s1) {  
    Sequence<Integer> result = new Sequence1L<Integer>();  
  
    if(s1.length()>1){  
        int temp = (s1.entry(0)+s1.entry(1))/2;  
        result.remove(0);  
        result = smooth(result);  
        result.add(0,temp);  
    }  
    return result;  
}
```