Introduction to Algorithms: 6.006 Massachusetts Institute of Technology

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## Problem Set 1

Name: Your Name Collaborators: None

## Problem 1-1.

(a)  $f_5, f_3, f_4, f_1, f_2$ 

(b) 
$$\{f_1, f_2\}, f_5, \{f_3, f_4\}$$

(c) 
$$f_2 = \frac{n!}{n!6!} = 1/(6!)$$
  
 $f_4 = \frac{n!}{(n/6)!(5n/6)!}$   
 $f_2, f_5, \{f_3, f_4\}, f_1$ 

(d)  $f_5, f_2, f_4, \{f_1, f_3\}$ 

Problem Set 1

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## Problem 1-2.

- (a) For j equals i to i+k/2, do insert\_at(j, delete\_at(2\*i+k-j-1)).
- (b) For j equals 0 to k-1, do insert\_at(j, delete\_at(i+j)).

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Problem 1-3.

Problem Set 1

## Problem 1-4.

" $\rightarrow$ " means point to

- (a) insert\_first(x):  $x.next \to L.head$ ,  $L.head.prev \to x$ , x.prev = null,  $L.head \to x$  insert\_last(x):  $x.prev \to L.tail$ , x.next = null,  $L.tail.next \to x$ ,  $L.tail \to x$  delete\_first(): L.head.next.prev = null,  $L.head \to L.head.next$  delete\_last(): L.tail.prev.next = null,  $L.tail \to L.tail.prev$
- (b)  $L'.head \rightarrow x_1, L'.tail \rightarrow x_2$   $x_1.prev.next \rightarrow x_2.next, x_2.next.prev \rightarrow x_1.prev$  $x_1.prev = null, x_2.next = null$
- (c)  $L_2.tail.next \rightarrow x.next \ x.next.prev \rightarrow L_2.tail \ L_2.head.prev \rightarrow x \ x.next \rightarrow L_2.head$
- (d) Submit your implementation to alg.mit.edu.