

## Corrections to the Notes

### Dijkstra with Bounded Weights

1. Page 3, " 9. We define a potential function Let  $D$  be structure.  $\Phi(D) = \alpha(\sum_{x \in S} \text{index of bucket that } x \text{ is in})$ " You should specify that  $S$  is the set of nodes in the structure.

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2. Page 4, should  $O(\log L)$  be  $O(\log C)$  instead? Typo. 50 cents. kkma
3. Page 8, Line -7 from the bottom. "The potential change of just dealing with  $x$  is  $q - \alpha q = (1 - \alpha)q$ ."

"potential change" should be "amortized cost"?

I think that  $q$  is actual cost,  $-\alpha * q$  is potential change.

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(This whole section changed so its hard to locate this change.)

4. Page 8, bottom. In the deletemin, you don't consider the potential change of removed min node. The potential change of removed node is  $\alpha * j$  because it was in old  $B_j$ . If you consider this then the amortized cost of DELETEMIN is  $O(1)$ .

This is a serious mistake but it leads to a BETTER result. DELETEMIN does indeed have amortized cost  $O(1)$ . INSERT still has amortized cost  $O(\log C)$  so the result is not improved.

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5. Page 8 point 3, should  $j$  be  $b$  instead? kkma. NO, this should be  $b$  as stated. You owe me 50 cents :-)

## UNION-FIND

1. Lemma 3.1, page 2, says: " $\text{rank}(x) \leq \lg x$ " But  $x$  is a node; it should be " $\text{rank}(x) \leq \lg n$ "

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2. Def 6.4, page 5, part(2) Should probably say something about  $x$  not being a root, since otherwise  $\text{parent}(x)$  doesn't make too much sense.  
jk. \$1.00
3. Note 6.6, page 5 "The proof in these notes seems to work find..." That should be "fine..."  
jk. 50 cents.
4. Page 6. You have  
"..for all but  $\log^*n + O(1)$  of the elements  $x$  on the branch" and later  
" Hence  $\Delta\Phi = a(L - (\log^* L + O(1)))$ "  
Both of the  $\log^*$ 's should be the same, and I they should both be  $\log^* L$ .  
jk. \$1.00
5. Page 7. Thm 8.1, Case I-2, first line, stating the case: I think  $\text{rank}(\text{parent}(x))$  should be  $\text{rank}(\text{root})$ , since we are talking about the case we are in after the find.  
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6. Page 8. Case II.1 "Combining its falsity with the Case2 condition we have  $\lg \text{rank}(x) < \lg \text{rank}(\text{parent}(x)) = \text{rank}(\text{root})$  Hence  $\text{parent}(x)$  is the element of the lowest rank such that  $\lg(\text{rank}(\text{parent}(x))) = \text{rank}(\text{root})$ "  
 $\text{rank}(\text{root})$  should be  $\lg(\text{rank}(\text{root}))$ ?  
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7. Page 8. Thm 8.1 Case II-2, page 8. Extra pair of parens in  $\log^*(\text{rank}(\text{root}))$ .  
jk. 50 cents.
8. Page 9. Thm 9.1 Case I. "The node  $x$  goes from being a root from being a child..." should be "The node  $x$  goes from being a root to being a child..."  
jk. 50 cents.

9. Page 9, Proof of Theorem 9.1. Line 5 and 6 of the proof. "No other nodes phi value changes" should be "No other node's phi value changes," or more properly, "The phi values of all other nodes remain the same."  
jk. 50 cents.
10. Page 10. Thm 9.1 Case I-2 "NEW  $\phi(x)$ – OLD  $\phi(x)$  is" [blank] should probably have something in the [blank]  
jk. 50 cents.
11. Page 10. Note 9.2 "Extra credit who can tell me if I'm right or their right, and whats going on" should be "Extra credit to the person who can tell me if I'm right or they're right and what's going on."  
jk. 50 cents.

WINNERS:

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kkma- \$0.00. One correct correction, one wrong one. Cancelled.

jk- \$7.00