

## Corrections

### Slides

All slide numbers refer to the printed copy of the slides.

- 5.2 Fibonacci Heaps
  - Slide 3-4: Replace all occurrences of  $n$  that count the number of operations by  $k$  (optionally, replace “ $k$  inserts” by “ $k/2$  inserts and  $k/2$  decrease-key”)
- 5.2 Fibonacci Heaps (Analysis)
  - Slide 3:  $O(x)$  should be replaced by  $O(x + 1)$  in order to account for the possibility  $x = 0$
  - Slide 4: There is an illustration in the online version of the slides why  $\text{marks}(H') \leq \text{marks}(H)$ , and not  $\text{marks}(H') = \text{marks}(H)$
  - Slide 4:  $\Delta\Phi = d(n) + 1 - \text{trees}(H)$  should be replaced by  $\Delta\Phi \leq d(n) + 1 - \text{trees}(H)$
- 6.1 & 6.2 Graph Searching
  - Slide 20: In the example, when  $v$  is black, the discovery time of  $v$  should be replaced by a smaller number, say, 4
  - Slide 20: “In all cases  $v.f < v.u$ ” should be replaced by “In all cases  $v.f < u.f$ ”
- 6.3 Minimum Spanning Tree
  - Slide 11 (Prim’s Algorithm): the indentation of lines 14-20 should be removed so that the while-loop is outside the for-loop from line 6 (thanks to Josh Send)
  - Slide 11 (Prim’s Algorithm): in line 20 of the pseudocode, “newKey=v” should be replaced by “newKey=w” (thanks to Dmitrij Szamozvancev)
- 6.4 Single-Source Shortest Path
  - skip Slides 6-12 (they appear later as slides 14-20 again)
  - Slide 22: “Maintain set of vertices  $u$  with  $u.\delta = v.d$ ” should be replaced by “Maintain set of vertices  $u$  with  $u.\delta = u.d$ ” (optionally, replace “with minimal  $v.\delta$ ” by “with minimal  $v.d$ ”)
- 6.6 Maximum Flow
  - Slide 11:  $\sum_{u \in S, v \in T} c(s, t)$  should be replaced by  $\sum_{u \in S, v \in T} c(u, v)$  (thanks to an anonymous student)
  - Slide 11, proof of the Flow Value Lemma:  $|f| = \sum_{(s,w) \in E} f(s, w)$  should be replaced by  $|f| = \sum_{w \in V} f(s, w)$  (this is in order to account for the case where there are edges going to  $s$ , otherwise the old formula works, too)
  - Slide 17: Replace “after  $C$  iterations” by “after  $V \cdot C$  iterations”
  - Slide 19, line 2, runtime of Ford Fulkerson: Replace  $O(E \cdot C)$  by  $O(E \cdot V \cdot C)$ .
  - Slide 21: Replace  $G = (V \cup L, E)$  by  $G = (L \cup R, E)$
  - Slide 25: Replace  $G'$  by  $\tilde{G}$
  - Slide 25: Switch the words “receives” and “sends” in bullets a) and b)
- 7 Geometric Algorithms
  - Slide 8 (first part):  $(3, 1) \times (1, 4) = 11$  should be replaced by  $(3, 1) \times (1, 3) = 8$ . One line below  $(-1, 3) \times (1, 4) = -7$  should be replaced by  $(-1, 3) \times (1, 3) = -6$ .
  - Slide 8 (second part):  $(-3, -1) \times (4, 2) = -10$  should be replaced by  $(-3, -1) \times (-4, 2) = -10$ . One line below  $(-2, -2) \times (4, 2) = 4$  should be replaced by  $(-2, 2) \times (-4, 2) = 4$ .
  - Slide 15: you may want to add that  $h$  denotes the number of points on the convex hull

### Handout

- Please ignore the reference to Van Emde Boas Trees on page 81.